

# Product Specification

Product Name: AC Contactor

Product Model: **NDC1NN-115~800**

Date: 15 January 2021

Prepared by	Reviewed by	Approved by
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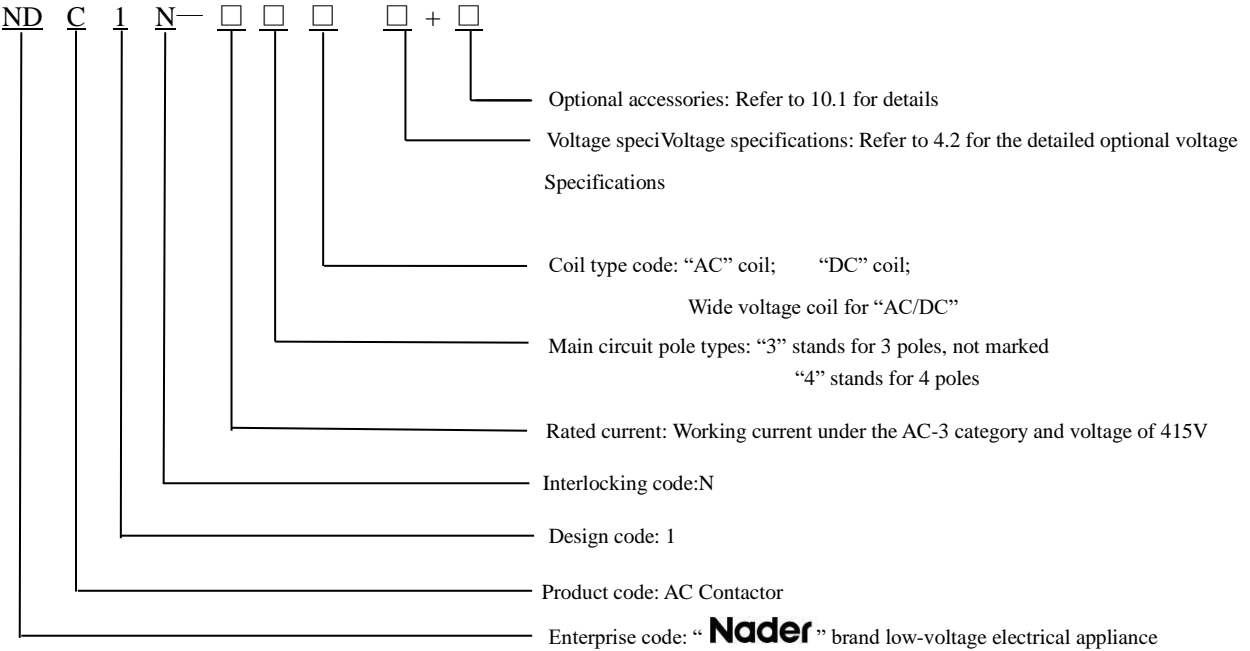
### 1、Application

The NDC1N-115~800 series of AC contactors (hereinafter referred to as contactors) have the AC 50Hz (or 60Hz) and the rated insulation voltage of 1000V, and are mainly used for the electric circuit with the rated working voltage of 415V and the rated working current of 52~195A as well as the AC-4 utilization category for remotely connecting and breaking the circuit and frequently starting & controlling AC motors. They can be used as magnetic starters with the appropriate thermal overload relays to protect the circuit in which overload may occur.

### 2、Outline sketch of the contactor (only for reference)



### 3、Model implications of the contactor



### 4、Technical parameter

#### 4.1 Main contacts characteristics

Parameter	Specification	NDC1N-115	NDC1N-150	NDC1N-185	NDC1N-225	NDC1N-265	NDC1N-330	NDC1N-400	NDC1N-500	NDC1N-630	NDC1N-800
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Rated current Ie /A	AC-3	415V	115	150	185	225	265	330	400	500	630	800
		690V	86	107	118	135	170	225	305	335	460	470
	AC-4	415V	52	60	79	85	105	117	138	147	188	195
		690V	49	57	69	82	98	107	135	145	170	175
	AC-1	690V	200	250	275	315	350	500	600	750	900	1050
Agreed thermal current of the free air Ith /A		200	250	275	315	350	500	600	750	900	1050	
Impulse withstand voltage Uimp /kV		12										
Rated insulation voltage Ui /V		1000										
Rated voltage Ue /V		380/415 660/690										
Rated power/kW	AC-3	220/240V	30	40	55	63	75	100	110	147	200	250
		380/400V	55	75	90	110	132	160	200	250	335	450
		415V	59	80	100	110	140	180	220	280	375	450
		440V	59	80	100	110	140	200	250	295	400	450
		500V	75	90	110	129	160	200	257	355	400	450
		660/690V	80	100	110	129	160	220	280	355	450	475
Mechanical life		300×10 <sup>4</sup> (≤1200 times/h)						100×10 <sup>4</sup> (≤600 times/h)				
AC-3	Electrical life	80×10 <sup>4</sup>	80×10 <sup>4</sup>	50×10 <sup>4</sup>	50×10 <sup>4</sup>	50×10 <sup>4</sup>	50×10 <sup>4</sup>	30×10 <sup>4</sup>	20×10 <sup>4</sup>	20×10 <sup>4</sup>	10×10 <sup>4</sup>	
	Operating frequency h <sup>-1</sup>	300				150						
AC-4	Electrical life	15×10 <sup>4</sup>						8×10 <sup>4</sup>		5×10 <sup>4</sup>	3×10 <sup>4</sup>	
	Ooperating frequency h <sup>-1</sup>	100										
Average impedance of each pole (mΩ)		0.37	0.35	0.33	0.32	0.3	0.28	0.26	0.18	0.12	0.12	
Main circuit connection capacity	Cable	number	1	1	1	1	1	1	2	2	\	\
		size/mm <sup>2</sup>	95	120	150	185	240	250	150	240	\	\
	Copper bar	number	2	2	2	2	2	2	2	2	2	2
		size/mm	20×3	25×3	25×3	32×4	32×4	30×5	30×5	40×5	60×5	60×5
Impact resistance 1/2 sine wave =11ms	contactor opened (gn)		9		7		6		6	9		6
	contactor closed (gn)		15		15		15		15	15		15
Anti-vibration performance 8...30 Hz	contactor opened (gn)		2		2		2		1.5	2		2
	contactor closed (gn)		6		6		5		5	4		4

## 4.2 Coil control circuit characteristics

Model			NDC1N-115	NDC1N-150	NDC1N-185	NDC1N-225	NDC1N-265	NDC1N-330
Normal coil	Rated control voltage Uc /V		AC:24、36、48、110、220、240、380、415、480（50Hz、50/60Hz） DC:24、110、220		AC:24、36、48、110、200、220、230、240、380、400、415（50Hz、50/60Hz） DC:24、48、110、220		AC:24、36、48、110、220、230、380、400（50/60Hz） DC:24、48、110、220	
	Pull-in voltage range		85%Uc～110%Uc					
	Discharge voltage range		20%Uc～75%Uc（AC）、10%Uc～70%Uc（DC）					
	AC coil	Pull-in time /ms	≤50		≤40		≤70	
		Discharge time /ms	≤25（50Hz） ≤130（50/60Hz）		≤20（50Hz） ≤150（50/60Hz）		≤170	
		Pull-in power consumption /VA	≤550（50Hz） ≤855（50/60Hz）		≤805（50Hz） ≤1180（50/60Hz）		≤650	

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		Retention power consumption /VA		≤55（50Hz） ≤9（50/60Hz）	≤64（50Hz） ≤14（50/60Hz）	≤15
	DC coil	Pull-in time /ms		≤40	≤50	≤50
		Discharge time /ms		≤50	≤70	≤65
		Pull-in power consumption /W		≤760	≤900	≤810
		Retention power consumption /W		≤4.9	≤5.1	≤5.0
Wide voltage coil	Rated control voltage Uc /V			AC/DC：48~132V、100~250V		
	Pull-in voltage range			85%Ucmin~110%Ucmax		
	Discharge voltage range			0.48Ucmin-0.52Ucmin		
	48~13 2V AC/D C	Pull-in time /ms	PLC control	≤40	≤40	≤70
			Power control	≤40	≤40	≤70
		Discharge time /ms	PLC control	≤22	≤22	≤25
			Power control	≤140	≤140	≤120
		Pull-in power consumption VA/W		≤250	≤250	≤450
		Retention power consumption VA/W		≤13	≤13	≤13
	100~2 50V AC/D C	Pull-in time /ms	PLC control	≤90	≤80	≤70
			Power contro	≤90	≤80	≤70
		Discharge time /ms	PLC control	≤22	≤30	≤25
			Power contro	≤150	≤140	≤120
		Pull-in power consumption VA/W		≤250	≤250	≤450
		Retention power consumption VA/W		≤16	≤16	≤16
Control circuit connection capacity	Cord/mm²	1piece /2pieces	2.5			
	Hard wire /mm²	1piece	4			
	Tightening torque /N.m		0.8~1.2			

### Coil control circuit characteristics (continuing)

Model			NDC1N-400	NDC1N-500	NDC1N-630	NDC1N-800
Normal coil	Rated control voltage Uc /V		AC:36 110 220 380 (50/60Hz) DC:110 220	AC:36 110 220 380 (50/60Hz) DC:48 110 220	AC:110 220 230 380 (50/60Hz) DC:110 220	AC:48(only quick-response coil) 110~120 220~230 380~400 (50/60Hz) DC: 48(only quick-response coi) 110 220
	Pull-in voltage range		85%Uc~110%Uc			
	Discharge voltage range		20%Uc~75%Uc (AC)、10%Uc~70%Uc (DC)			
	AC coil	Pull-in time /ms	40~75	40~75	40~80	≤80 (general) ≤60 (quick)
		Discharge time /ms	100~170	100~170	100~200	≤180 (normal) ≤80 (quick)
		Pull-in power consumption /VA	≤1075	≤1100	≤1650	≤1700 (normal) ≤1000 (quick)
		Retention power consumption /VA	≤22	≤24	≤27	≤27 (normal) ≤47 (quick)
	DC coil	Pull-in time /ms	50~65	50~65	60~70	≤80 (normal) ≤20 (quick)
		Discharge time /ms	45~65	45~65	40~50	≤80 (normal) ≤50 (quick)

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		Pull-in power consumption /VA		≤1140		≤1220		≤1920		≤1700（normal） ≤733（quick）			
		Retention power consumption /VA		≤7.5		≤8.0		≤12.5		≤27（normal） ≤48（quick）			
Wide voltage coil		Rated control voltage Uc /V		AC/DC：48~132V、100~250V									
		Pull-in voltage range		85%Ucmin~110%Ucmax									
		Discharge voltage range		0.48Ucmin-0.52Ucmin									
		48~132 V AC/DC		Pull-in time /ms		PLC control		60~75		70~85		70~85	
						Power control		60~75		70~85		70~85	
				Discharge time /ms		PLC control		21~25		21~25		21~25	
						Power control		60~120		80~140		80~140	
				Pull-in power consumption /VA		≤450		≤550		≤600			
				Retention power consumption /VA		≤13		≤13		≤13			
		100~250 V AC/DC		Pull-in time /ms		PLC control		60~75		70~85		70~85	
						Power control		60~75		70~85		70~85	
				Discharge time /ms		PLC control		21~25		21~25		21~25	
						Power control		60~120		100~160		100~160	
				Pull-in power consumption /VA		≤450		≤550		≤600			
				Retention power consumption /VA		≤16		≤16		≤16			
Control circuit connection capacity		Cord/mm²		1piece /2pieces		2.5							
		Hard wire /mm²		1piece		4							
		Tightening torque /N.m		0.8~1.2									

Note: 1. coil pull-in time: refers to the time from the minute the coil gets electricity to the time the main circuit closes.

2. coil discharge time: refers to the time from the minute the coil loses electricity to the time the main circuit disconnects.

## 5、Working condition

1) Free from acidic, alkaline or other corrosive gases in the ambient air;

2) Temperature:

Storage: -60℃~+80℃;

Operating: -25℃~+40℃;

Maximum allowable temperature at the standard control voltage: -40℃~+70℃<sup>(note1)</sup>。

3) Altitude in the installation place is no more than 3,000m (derating is required in case of being above 3,000m);

4) The relative air humidity at the installation site should not exceed 95%. Condensing should be avoided in the working environment.

5) High temperature or high altitude environment capacity reduction:

High temperature or high altitude environment capacity reduction, according to the following data reference

AC-1 Temperature drop capacity coefficient (Elevation≤3000m)										
Type	NDC1N- 115	NDC1N- 150	NDC1N- 185	NDC1N- 225	NDC1N- 265	NDC1N- 330	NDC1N- 400	NDC1N- 500	NDC1N- 630	NDC1N- 800

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current /A	≤40℃	200	250	275	315	350	500	600	750	900	1050
	≤60℃	175	200	250	280	300	460	530	630	730	850
	≤70℃ (Uc)	130	160	180	200	250	390	440	550	650	700

Elevation drop capacity coefficient (temperature≤40℃)		
Elevation(meter)	Current capacity coefficient	Voltage capacity coefficient
3000	1	1
3500	0.9	0.92
4000	0.8	0.9
4500	0.7	0.88
5000	0.6	0.86
>5000	Not allowed	Not allowed

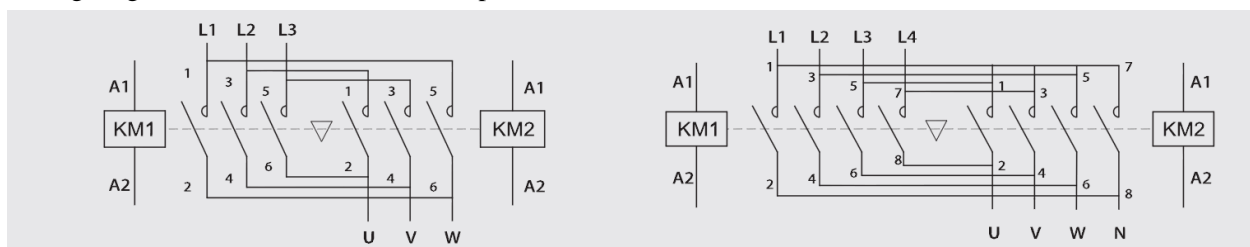
Note 1: During working at the limit operating temperature, the coil shall operate at the rated voltage, and the average temperature within 24h shall not be more than 35℃;

If the low temperature -40℃ conditions are required, special notes shall be made.

## 6、Wiring diagram

### 6.1 Wiring diagram of the normal coil and main circuit

Wiring diagram for control of reversible operation

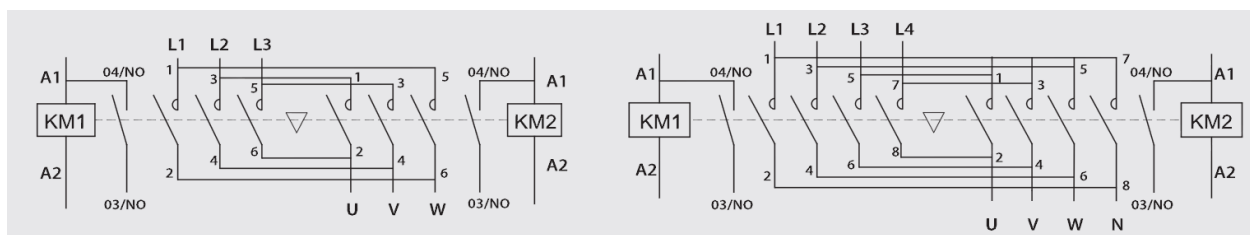


DC coil:NDC1N-115~800

NDC1N-1154~8004

AC coil:NDC1N-115~330

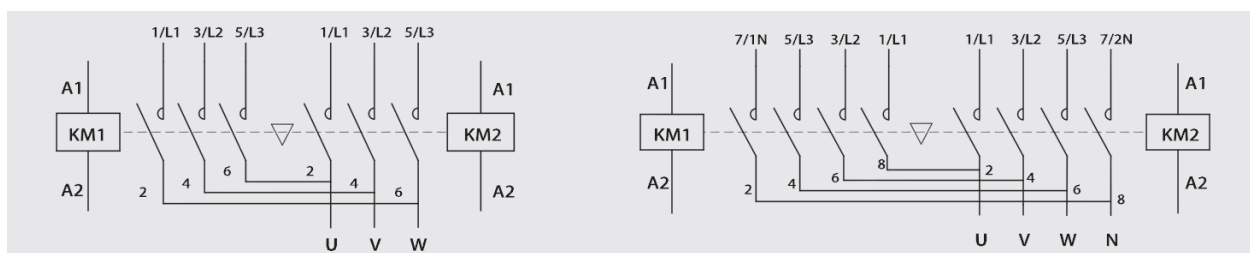
NDC1N-1154~3304



AC coil:NDC1N-400~800

NDC1N-4004~8004

Wiring diagram for the control of switching between two power supplies



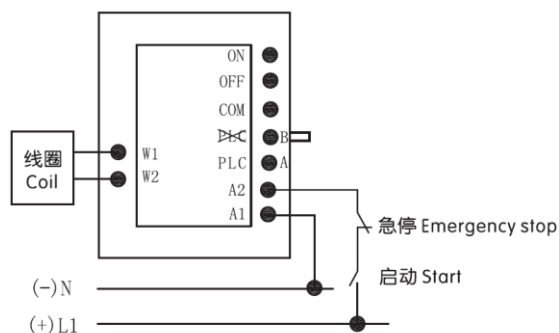
NDC1N-115~800

NDC1N-1154~8004

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## 6.2 Wiring control plan of the wide voltage coil

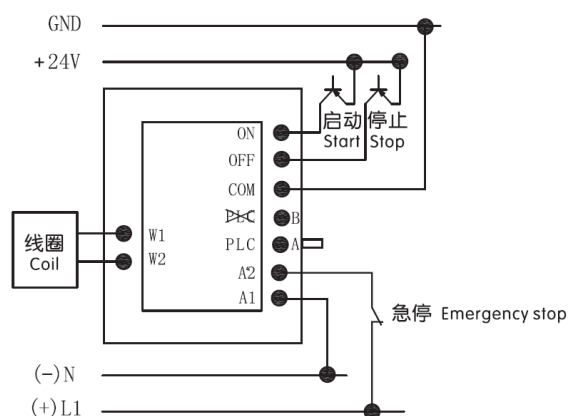
(1) Turn the dial switch to **PLC B** for control of power supply sides A1-A2, and perform control according to the control logic with the control diagram shown below:



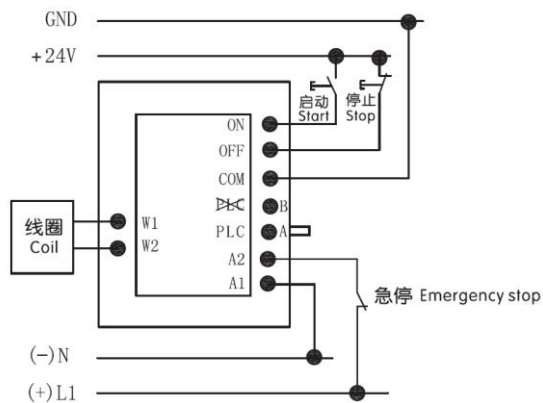
### (2) PLC control

Turn the dial switch to **PLC A** with ON, OFF, COM connecting with PLC, and perform control according to the control logic with the control diagram shown below:

Note: PLC adopts the relay output type or transistor-source output type.



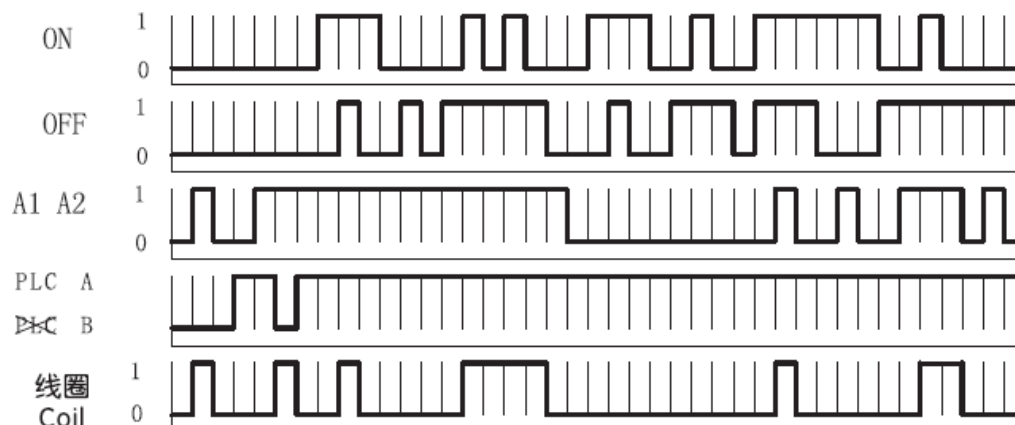
(3) Control of the active command appliance: Place the dial switch in **PLC A** with ON, OFF, COM connecting with the command appliance (button), and perform control according to the control logic with the control diagram shown below:





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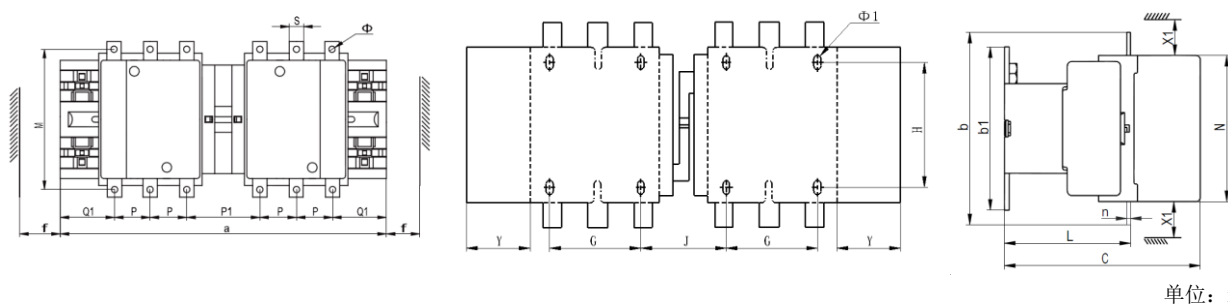
Control coil control logic wave form



Note: when on  $\overline{PLC}B$ , ON or OFF status does not influence the coil, so omitting the logic wave form.

## 7、Outline and installing dimensions

### 7.1 NDC1N-115~330 Outline and installing dimensions

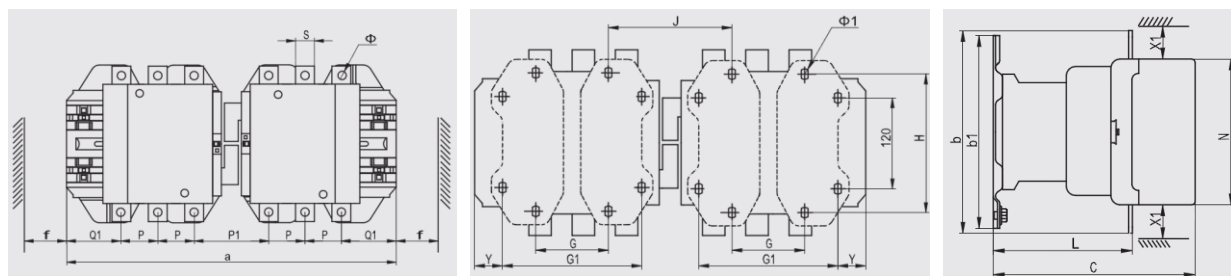


单位: mm

NDC1N	a	p	P1	Q1	S	ϕ	f	b	b1	M	c	L	G	H	ϕ1	J	n	Y	X1	
																			≤500V	>500V
115	343	37	75	60	15	M6	109	162	137	147	171	107	80	120-106	6.5	72	3	44	10	15
1154	418	37	75	60	15	M6	109	162	137	147	171	107	80	120-106	6.5	106	3	44	10	15
150	346	40	72	57.5	20	M8	109	170	137	150	171	107	80	120-106	6.5	72	3	44	10	15
1504	420	40	72	55.5	20	M8	109	170	137	150	171	107	80	120-106	6.5	106	3	44	10	15
185	357	40	78	59.5	20	M8	117	174	137	154	181	113.5	80	120-106	6.5	76	3	44	10	15
1854	437	40	78	59.5	20	M8	117	174	137	154	181	113.5	80	120-106	6.5	118	3	44	10	15
225	357	48	60	51.5	25	M10	117	197	137	172	181	113.5	80	120-106	6.5	76	3	44	10	15
2254	437	48	54	47.5	25	M10	117	197	137	172	181	113.5	80	120-106	6.5	118	3	44	10	15
265	424	48	99	66.5	25	M10	143	203	145	178	213	141	96	120-106	6.5	111	4	38	10	15
2654	520	48	99	66.5	25	M10	143	203	145	178	213	141	96	120-106	6.5	157	4	38	10	15
330	445	48	105	74	25	M10	143	206	145	181	219	145	96	120-106	6.5	124	4	38	10	15
3304	541	48	105	74	25	M10	143	206	145	181	219	145	96	120-106	6.5	170	4	38	10	15

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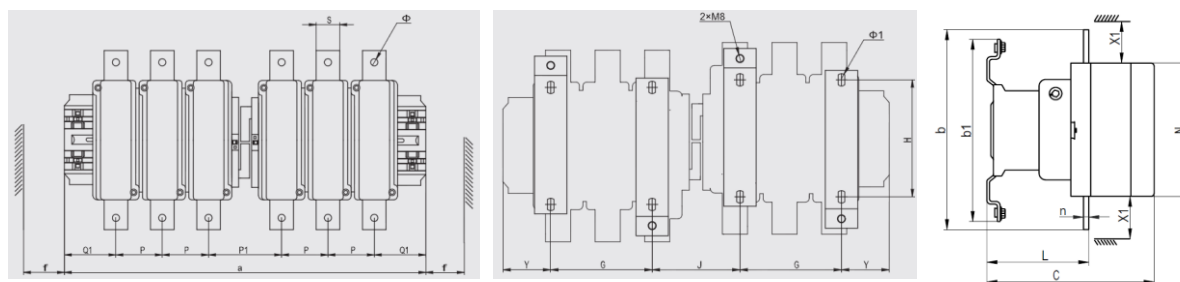
## 7.2 NDC1N-400~500 Outline and installing dimensions



单位: mm

NDC1N	a	p	P1	Q1	S	φ	f	b	b1	M	J	c	L	G	G1	φ1	H	n	Y	X1	
																				≤500V	>500 V
400	445	48	105	74	25	M10	151	206	209	181	156	219	145	80	170	8.5	175	4	19.5	15	20
4004	541	48	105	74	25	M10	151	206	209	181	156	219	145	80	170	8.5	175	4	67.5	15	20
500	485	55	111	77	30	M10	169	238	209	208	156	232	146	80	170	8.5	175	5	39.5	15	20
5004	595	55	111	77	30	M10	169	238	209	208	156	232	146	140	230	8.5	175	5	34.5	15	20

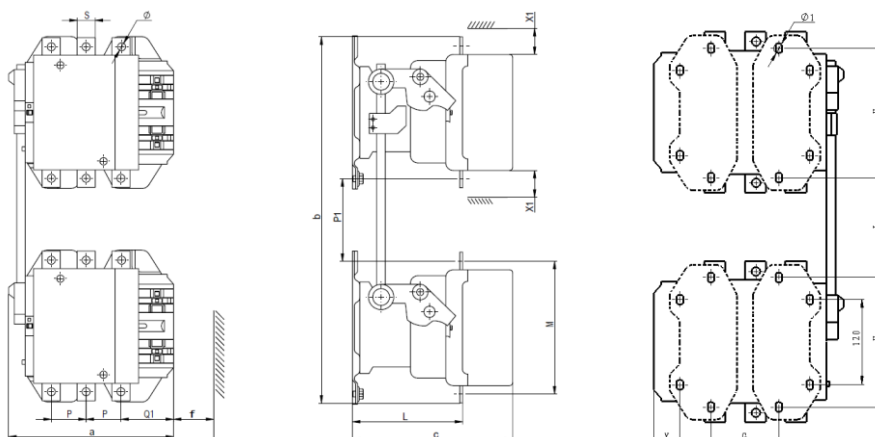
## 7.3 NDC1N-630 Outline and installing dimensions



单位: mm

NDC1N	a	p	P1	Q1	S	φ	f	b	b1	M	c	L	G	H	φ1	J	n	Y	X1	
																			≤500V	>500 V
630	636	80	138	89	40	M12	201	304	280	264	255	155	180(100-195)	180-190	10.5	139	8	68.5	20	30
6304	796	80	138	89	40	M12	201	304	280	264	255	155	240(150-275)	180-190	10.5	139	8	68.5	20	30
800	636	80	138	89	50	M12	201	338	280	312	251	155	180(100-195)	180-190	10.5	139	8	68.5	20	30
8004	796	80	138	89	50	M12	201	338	280	312	251	155	240(150-275)	180-190	10.5	139	8	68.5	20	30

## 7.4 NDC1N-400~500C Outline and installing dimensions

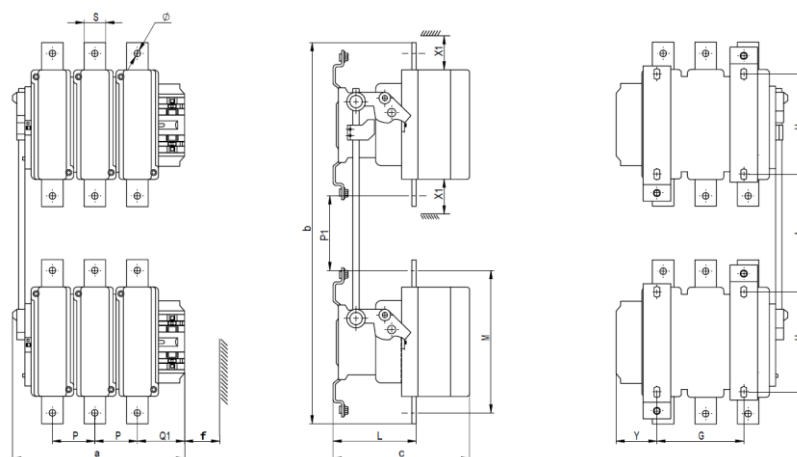


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单位: mm

NDC1N	a	p	Q1	S	$\phi$	f	b	P1	M	J	c	L	G	$\phi 1$	H	Y	X1	
																	$\leq 500V$	$> 500 V$
400	240	48	74	25	M10	151	481-586	94-199	181	100-205	219	145	80	8.5	180	19.5	15	20
4004	288	48	74	25	M10	151	481-586	94-199	181	100-205	219	145	80	8.5	180	67.5	15	20
500	261	55	77	30	M10	169	533-618	87-172	208	120-205	232	146	80	8.5	180	39.5	15	20
5004	316	55	77	30	M10	169	533-618	87-172	208	120-205	232	146	140	8.5	180	34.5	15	20

## 7.5 NDC1-630~800C Outline and installing dimensions



单位: mm

NDC1N	a	p	Q1	S	$\phi$	f	b	P1	M	c	L	G	H	J	$\phi 1$	Y	X1	
																	$\leq 500V$	$> 500 V$
630	309	80	89	40	M12	201	669-684	101-116	264	255	155	180(100-195)	190	180-195	10.5	68.5	20	30
6304	389	80	89	40	M12	201	669-684	101-116	264	255	155	240(150-275)	190	180-195	10.5	68.5	20	30
800	309	80	89	40	M12	201	703-718	101-116	312	251	155	180(100-195)	190	180-195	10.5	68.5	20	30
8004	389	80	89	40	M12	201	703-718	101-116	312	251	155	240(150-275)	190	180-195	10.5	68.5	20	30

Note: f: Minimum distance of the coil removed; X1: Minimum electrical clearance (flashover distance)

The P, Q1, S, T, T1,  $\Phi$ , M, L,  $\Phi 1$ , n, Y are designed with the tolerance of object about 1mm, others are 5mm.

## 8、Installation Mode

Bolt installation

## 9、Packaging and Storage

Each set of assembled product is packed in a case, which should be stored in a warehouse with the air ventilation and the temperature between -60°C and +80°C. No acidic alkaline or other corrosive gas exists in the ambient air in the warehouse.

## 10、Accessories and Delivery List

### 10.1 Accessories

Contactors are supplied with optional accessories. If accessories are not required, it is not necessary

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to select them. Currently, NDC1N-115~800 series products can be installed with the following optional accessories:

Auxiliary contact NF1 series, reed type auxiliary contact F1-11DS/C1, delay auxiliary contact NS1 series.

**NF1Auxiliary contact:**

Au xili ary con tact	Type		NF1								
	Rated insulation voltage Ui V		690								
	Rated operating voltage Ue V		AC:380    DC:220								
	Agreed thermal current of the free air Ith A		10								
	Rated operating current Ie/A	AC-15 (360VA)	0.95								
		DC-13 (33W)	0.15								
	Minimum connected load		17V    5mA				12V 11mA				
	Installation type		top								
	Contact type	code		11	20	02	40	31	13	04	22
		Contact number NO		1	2	0	4	3	1	0	2
		Contact number NC		1	0	2	0	1	3	4	2
	Connection capacity	cord	1 piece/2 pieces	2.5mm <sup>2</sup>							
		Hard wire	1 piece/2 pieces	4.0mm <sup>2</sup>							
		Tightening torque		0.8~1.2N.m							

**F1-11DS/C1 Auxiliary contact: :**

Auxiliary contact	Type		F1-11DS/C1							
	Rated operating voltage Ue max		60V							
	Impulse withstand voltage Uimp		6KV							
	Rated insulation voltage Ui		600V							
	Agreed thermal current Ith (≤60°)		0.5A							
	Minimum connected load		5V/10mA							
	Installation type		top							
	Contact type		1NC 1NO							
	Rated operating current	24V	0.1A							
		AC-15/DC-13 50V	0.05A							
	life	Mechanical life, maximum frequency		1,000,000 times,1200·h <sup>-1</sup>						
		Electrical life, maximum frequency		700,000 times,900 times·h <sup>-1</sup> (DC-13、AC-15)						
	Connection capacity	cord: 1 piece/2 pieces		0.75~2.5mm <sup>2</sup>						
		Hard wire: 1 piece/2 pieces		1~4.0mm <sup>2</sup>						
		Tightening torque		0.8~1.2N.m						

**NS1 Time delay auxiliary contact:**

Ti	Type	NS1
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me del ay aux iliary con tact	Rated insulation voltage $U_i$ V		690					
	Rated operating voltage $U_e$ V		AC:380 DC:220					
	Agreed thermal current of the free air $I_{th}$ A		10					
	Rated operating current $I_e$ /A	AC-15 (360VA)	0.95					
		DC-13 (33W)	0.15					
	Minimum connected load		24V 10mA					
	Installation type		top					
	Contact number		1NC 1NO					
	Time delay parameter	Time delay code	220	222	224	320	322	324
		Time delay type	power on time delay			power off time delay		
		Time delay time/s	0.1~3	0.1~30	10~180	0.1~3	0.1~30	10~180
		repetitive error	$\pm 5\%$					
Connection capacity	cord	1 piece/2 pieces	2.5mm <sup>2</sup>					
	Hard wire	1 piece/2 pieces	4.0mm <sup>2</sup>					
	Tightening torque		.8~1.2N.m					

### G1 series coil surge suppression module

Type		Specification for coil voltage	Function
G1-R series (resistance capacity)  Coil surge suppression module	G1-01R/C1-2650	AC24~48V	◆ Effectively protect circuits that are sensitive to “high frequency” interference. For sinusoidal voltage waveforms, where the total harmonic distortion is less than 5%
	G1-02R/C1-2650	AC50~110V	
	G1-03R/C1-2650	AC127~240V	
	G1-04R/C1-2650	AC250~440V	◆ The maximum voltage is limited to 3 $U_c$ and the maximum oscillation frequency is limited to 400 Hz. ◆ The disconnection time is slightly increased (1.1 to 1.3 times the normal time).
G1-K series (pressure sensitive)  Coil surge suppression module	G1-01K/C1-2650	AC24~48V	◆ Effectively protect circuits that are sensitive to “overvoltage” interference. ◆ The maximum transient overvoltage limit is 2 $U_c$ . ◆ The disconnection time is slightly increased (1.1 to 1.5 times the normal time).
	G1-02K/C1-2650	AC50~110V	
	G1-03K/C1-2650	AC127~240V	
	G1-04K/C1-2650	AC250~440V	

### 10.2 Ordering and delivery list

The following information shall be provided during ordering:

A full range of models and specifications, ordering quantity.

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For optional accessories, add the accessory specifications before the body model specifications.

Example: NDC1N-630 AC220V 50/60Hz+NF1-22, 10 sets.

The product delivery list contains the following information:

NDC1N-115~500 product:

Product body×1, grounding screws of the main circuit×12sets, rounding screw ×2 set, user manual ×1.

NDC1N-630, 800 product:

Product body×1, grounding screws of the main circuit×12sets, rounding screw ×2 set, phase insulated partitions ×8, user manual ×1.

If provided with optional accessories, the default accessories will be installed on the contactor body.

Each set of connection bolts of the main circuit includes: bolt (M12) ×1, spring washer ×1, plain washer×1, nut ×1.

Each set of grounding bolts includes: bolt (M12) ×1, plain washer ×1.

## 11、Precautions

- 1) The installation site of the product should not be shaky or vibrant.
- 2) For vertical installation of the product, the gradient between the installation surface and the horizontal plane is no more than  $\pm 5^\circ$ ;
- 3) Reliable cabling is required to prevent the terminals from being burnt out due to abnormal heat at the terminals; therefore, regular maintenance is necessary;
- 4) In the course of use, after a certain number of turn-on and segmentation operations of the silver contact of the contactor, the surface of the silver contact surface will be singed or blackened. This does not affect the use, and it should not be polished. Otherwise, the contact life would be reduced. When the contact is affected.