

Product Specification

Product Name: AC Contactor

Product Model: **NDC1-115~800**

Date: 01 January 2024

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	Document name	Product Specification	Document No.	NDT-06643
	Product Model and Name	NDC1-185~800 AC Contactor	Version	4
			Implementation Date	20210101

Revision History

Version	Revision Content	Revision Date	Revised by
0	Addition	20201105	Pan Wangling
1	Add 185~265、630~800	20200101	Pan Wangling
2	Revise the altitude of 4000m and increase the voltage of lightning arrester without derating	20220307	Wangyujun
3	New product protection grade and lower limit of canceling release time	20221220	Wangyujun
4	NDC1-330/400/500, Revision of agreed heating current values and benchmarking of product parameters in the same industry 630/800 ,Revise grounding screw specificatio, Changed fromM8toM12	20230328	Wangyujun
5	Add 115~185	20210305	mengxianglong

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1、Application

The NDC1-115~800 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 115~800A as well as the AC-3 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)



115~150



185~225



265~330



400

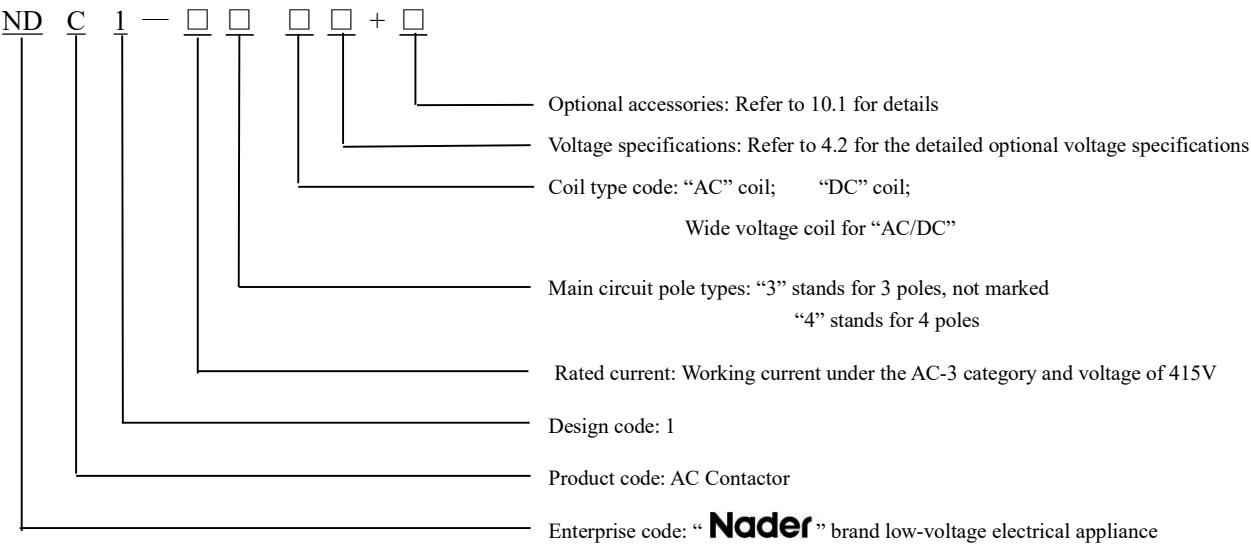


500



630~ 800

3、Model implications of the contactor



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4、Technical parameter

4.1 Main contacts characteristics

Parameter Specification			NDC1-115	NDC1-150	NDC1-185	NDC1-225	NDC1-265	NDC1-330	NDC1-400	NDC1-500	NDC1-630	NDC1-800
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	355	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									
额定功率/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
	1000V		65	65	100	100	147	160	185	335	450	450
Rated making capacity	AC-3、AC-4 Ue≤415V		10×Ie (AC-3)、12×Ie (AC-4)、1.5×Ie (AC-1)									
Rated breaking capacity A	AC-1 Ue≤690V		8×Ie (AC-3)、10×Ie (AC-4)、1.5×Ie (AC-1)									
Rated limiting short-circuit current			50kA (need to cooperate with fuses for experiments)									
Short time withstand current (starting from the cold state, θ ≤ 40℃, nocurrent 60 minutes before)		10s	1100	1200	1500	1800	2200	2650	3600	4200	5050	5500
		30s	640	700	920	1000	1230	1800	2400	3200	4400	4600
		1min	520	600	740	850	950	1300	1700	2400	3400	3600
		3min	400	450	500	560	620	900	1200	1500	2200	2600
		10min	320	350	400	440	480	750	1000	1200	1600	1700
Mechanical life	Mechanical life	1000×10 ⁴								`500×10 ⁴		
	Operating frequency h ⁻¹	≤1200								≤600		
Electrical life	AC-1	55×10 ⁴	55×10 ⁴	55×10 ⁴	45×10 ⁴	45×10 ⁴	50×10 ⁴	50×10 ⁴	40×10 ⁴	35×10 ⁴	40×10 ⁴	
	Operating frequency h ⁻¹	200	200	200	200	150	150	150	100	100	100	
	AC-3	110×10 ⁴	110×10 ⁴	110×10 ⁴	100×10 ⁴	100×10 ⁴	100×10 ⁴	95×10 ⁴	95×10 ⁴	60×10 ⁴	60×10 ⁴	
	Operating frequency h ⁻¹	300					150					
	AC-4	15×10 ⁴						8×10 ⁴		5×10 ⁴	3×10 ⁴	
	Operating	100										

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	frequency h ⁻											
Product weight/kg			3.6	3.7	4.6	4.7	7.1	8.5	9.1	10.8	18.6	18.7
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
Contact protection grade			IP20									
Main circuit connection capacity	Cable	number	1	1	1	1	1	2	2	2	\	\
		size/mm ²	95	120	150	185	240	150	185	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
	Tightening torqueN.m		10	18	18	35	35	35	35	35	58	58
Impact resistance 1/2 sine wave =11ms	contactor opened (gn)		9		7		6		6	9	6	6
	contactor closed (gn)		15		15		15		15	15		15
Anti-vibration performance 8…300 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			NDC1-115	NDC1-150	NDC1-185	NDC1-225	NDC1-265	NDC1-330		
Normal coil	Rated control voltage Uc /V		AC:24、36、48、110、220、240、380、415、480（50Hz、50/60Hz） DC:24、48、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~75%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		≤800（50Hz） ≤855（50/60Hz）		≤1000（50Hz） ≤1180（50/60Hz）		≤650	
			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 /VA		≤760		≤900		≤810			
	Retention power consumption/VA		≤4.9		≤5.1		≤5.0			
	Control circuit connection capacity	Cord/mm²	1piece/2pieces	2.5						
		Hard wire /mm²	1piece	4						
Tightening torque /N.m		0.8~1.2								

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Coil control circuit characteristics(continuing)

Model			NDC1-400	NDC1-500	NDC1-630	NDC1-800
No rm al co il	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 coil) 110 220
	Pull-in voltage range		85%Uc~110%Uc			
	Discharge voltage range		20%Uc~75%Uc (AC)、10%Uc~75%Uc (DC)			
	AC coil	Pull-in time /ms	40~75	40~75	40~80	≤80 (normal) ≤60 (quick-response coil)
		Discharge time /ms	≤170	≤170	≤200	≤180 (normal) ≤80 (only quick-response coil)
		Pull-in power consumption /VA	≤1075	≤1100	≤1650	≤1700 (normal) ≤1000 (only quick-response coil)
		Retention power consumption/VA	≤22	≤24	≤27	≤27 (normal) ≤47 (only quick-response coil)
	DC coil	Pull-in time /ms	≤65	≤65	≤70	≤80 (normal) ≤20 (only quick-response coil)
		Discharge time /ms	≤65	≤65	≤50	≤80 (normal) ≤50 (only quick-response coil)
		Pull-in power consumption /VA	≤1140	≤1220	≤1920	≤1700 (normal) ≤733 (only quick-response coil)
		Retention power consumption/VA	≤7.5	≤8.0	≤12.5	≤27 (normal) ≤48 (only quick-response coil)
Control circuit connection capacity		Cord/mm²	1piece/2pieces	2.5		
		Hard wire /mm²	1piece	4		
		Tightening torque /N.m		0.8~1.2		

4.3 低功耗线圈参数

Model		NDC1-115/150	NDC1-185/225	NDC1-265/330	NDC1-400	NDC1-500	NDC1-630~1250	
Rated control voltage Uc /V		AC: 110、220、380 (50/60Hz) DC: 48、110、220	AC: 110、220、380 (50/60Hz) DC: 48、110、220	AC: 110、220、380 (50/60Hz) DC: 48、110、220	AC: 110、220、380 (50/60Hz) DC: 48、110、220	AC: 110、220、380 (50/60Hz) DC: 48、110、220	AC: 110、220、380 (50/60Hz) DC: 48、110、220	
Pull-in voltage range		(0≤40℃): 0.6Uc~1.25Uc (40℃<0≤70℃): 0.7Uc~1.2Uc						
Discharge voltage range		10%Uc~50%Uc (DC); 20%Uc~50%Uc (AC)						
AC coil	Pull-in time /ms		≤90	≤80	≤65	≤65	≤85	≤85
	Discharge time /ms		≤35	≤35	≤35	≤35	≤35	≤35
	Pull-in power consumption /VA		≤300	≤300	≤500	≤500	≤600	≤700
	Retention power consumption/VA		≤32	≤32	≤35	≤35	≤40	≤50
DC coil	Cord/mm²	1piece/ 2pieces	2.5					
	Hard wire /mm²	1piece	4					
	Tightening torque /N.m		0.8~1.2					

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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: $-60^{\circ}\text{C} \sim +80^{\circ}\text{C}$;

Operating: $-25^{\circ}\text{C} \sim +40^{\circ}\text{C}$;

Maximum allowable temperature at the standard control voltage: $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$ 。

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 ($U_e \leq 1140\text{V}$, Elevation $\leq 3000\text{m}$)											
Type		NDC1-115	NDC1-150	NDC1-185	NDC1-225	NDC1-265	NDC1-330	NDC1-400	NDC1-500	NDC1-630	NDC1-800
current /A	$\leq 40^{\circ}\text{C}$	200	250	275	315	350	500	600	750	900	1050
	$\leq 60^{\circ}\text{C}$	175	200	250	280	300	460	530	630	730	850
	$\leq 70^{\circ}\text{C}$ (U_c)	130	160	180	200	250	390	440	550	650	700

注: AC-3, AC-4 are used at 70°C without derating.

Elevation drop capacity coefficient (temperature $\leq 40^{\circ}\text{C}$)		
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°C ;

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

Note2: If the system has lightning arrester, the voltage 4000m and below will not be derated 及。

Paralleling deartering parameters:

Parallel main pole increases working current

Multiply the current value by the following factors, which mainly consider the unbalanced

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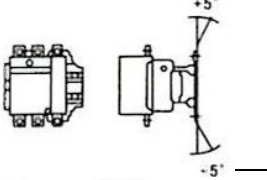
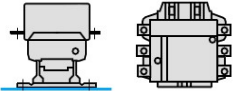
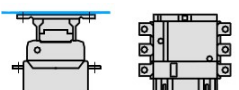
current between different main poles

-2-pole parallel connection: K=1.6

-3-pole parallel connection: K=2.25

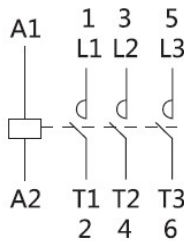
-4-pole parallel connection: K=2.8

6) Product installation conditions:

installation conditions	The produce is installed vertically, and the Inclination between the Inclinationsurface And the vertical surface $\leq \pm 5^\circ$	
	Please contact us for the use method	
	This mode of use prohibited	

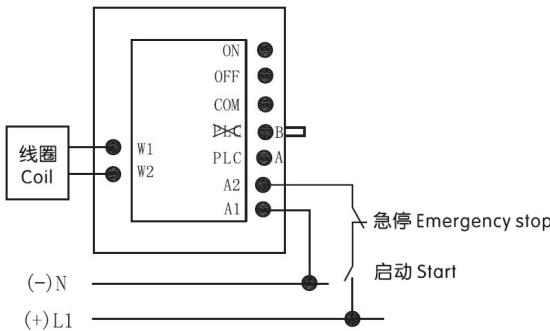
6、Wiring diagram

6.1 Wiring diagram of the normal coil and main circuit



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:

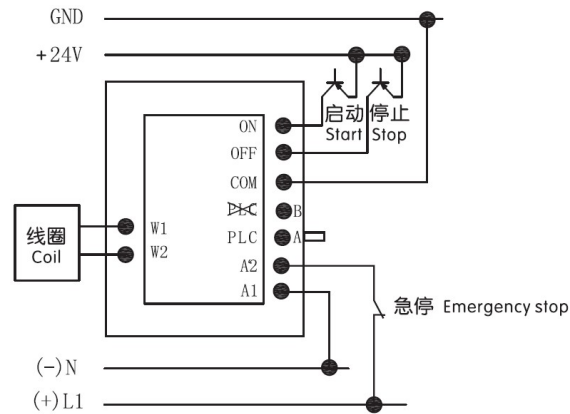


(2) PLC control

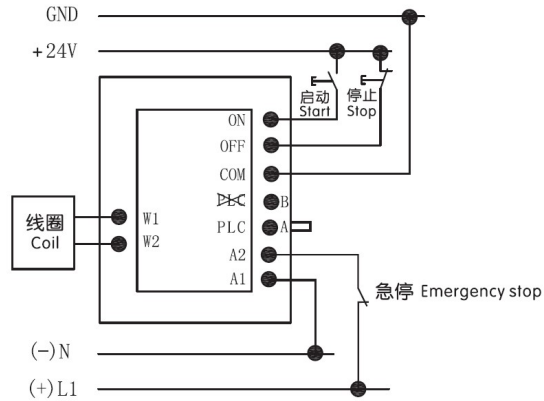
Turn the dial switch to PLC A with ON, OFF, COM connecting with PLC, and perform control according to the control logic with the control diagram shown below:

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

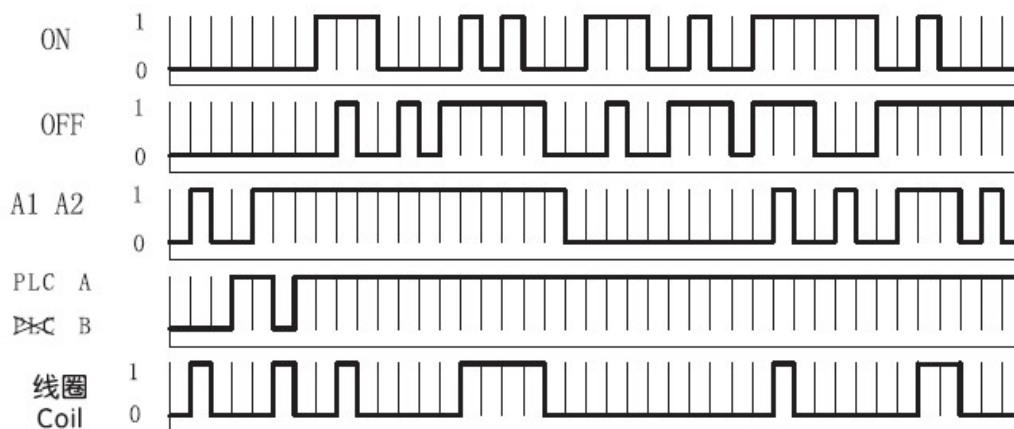
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(3) Control of the active command appliance: Place the dial switch in PLC A with ON, OFF, COM connecting with the command appliance (button), and perform control according to the control logic with the control diagram shown below:



Control coil control logic wave form

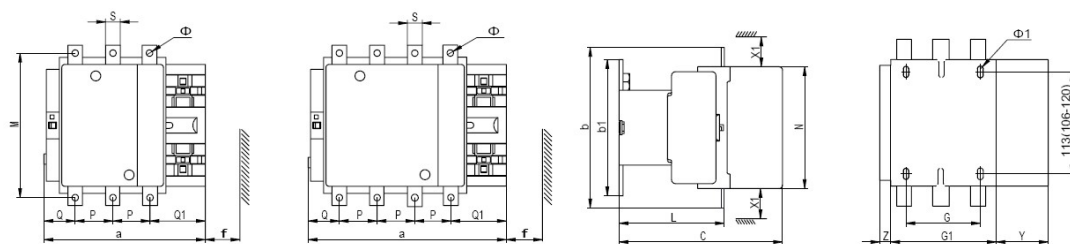


Note: when on PLC A, ON or OFF status does not influence the coil, so omitting the logic wave form.

7、Outline and installing dimensions

7.1 NDC1-115~330 Outline and installing dimensions

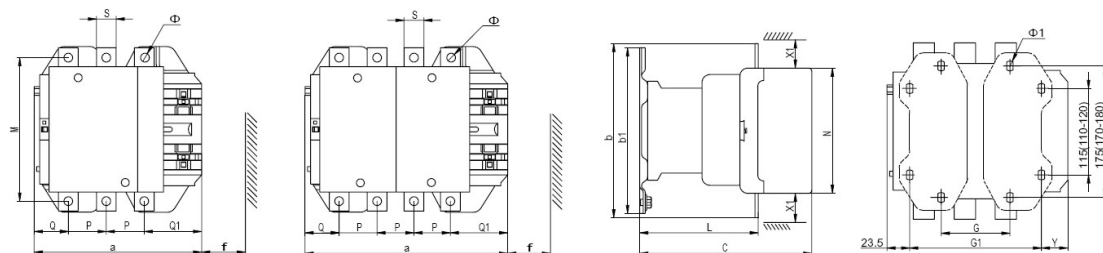
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Unit: mm

NDC1	a	p	Q1	S	Φ	f	b	b1	M	N	c	L	n	G	Φ1	G1	Y	X1	
																		≤500V	>500 V
115	163.5	37	60	15	6.5	131	162	137	147	124	171	107	3	80	6.5	106	44	10	15
1154	200.5	37	60	15	6.5	131	162	137	147	124	171	107	3	80	6.5	143	44	10	15
150	163.5	40	56	20	9	131	170	137	150	124	171	107	3	80	6.5	106	44	10	15
1504	200.5	40	55.5	20	9	131	170	137	150	124	171	107	3	80	6.5	143	44	10	15
185	168.5	40	59.5	20	9	130	174	137	154	127	181	113.5	3	80	6.5	111	44	10	15
1854	208.5	40	59.5	20	9	130	174	137	154	127	181	113.5	3	80	6.5	151	44	10	15
225	168.5	48	51.5	25	11	130	197	137	172	127	181	113.5	3	80	6.5	111	44	10	15
2254	208.5	48	47.5	25	11	130	197	137	172	127	181	113.5	3	80	6.5	151	44	10	15
265	201.5	48	67	25	11	147	203	145	178	147	213	141	4	96	6.5	140	38	10	15
2654	244.5	48	67	25	11	147	203	145	178	147	213	141	4	96	6.5	186	38	10	15
330	220	48	74	25	11	147	206	145	181	158	219	145	4	96	6.5	155	38	10	15
3304	261	48	74	25	11	147	206	145	181	158	219	145	4	96	6.5	202.5	38	10	15

7.2 NDC1-400~500 Outline and installing dimensions

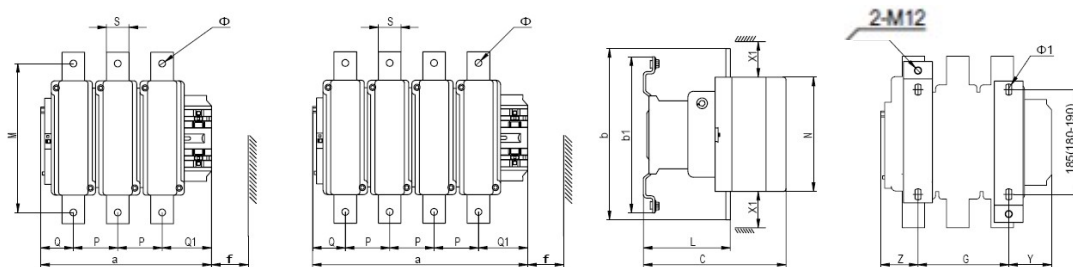


Unit: mm

NDC1	a	p	Q	Q1	S	Φ	f	b	b1	M	N	c	L	n	G	G1	Φ1	Y	X1	
																			≤500V	>500 V
400	213	48	43	74	25	11	151	206	209	181	158	219	145	5	80(66~102)	170(156~192)	8.5	19.5	15	20
4004	261	48	43	74	25	11	151	206	209	181	158	219	145	5	80(66~150)	170(156~240)	8.5	67.5	15	20
500	233	55	46	77	30	11	169	238	209	208	172	232	146	4	80(66~120)	170(156~210)	8.5	39.5	15	20
5004	288	55	46	77	30	11	169	238	209	208	172	232	146	4	140(66~175)	230(156~265)	8.5	34.5	15	20

7.3 NDC1-630 Outline and installing dimensions

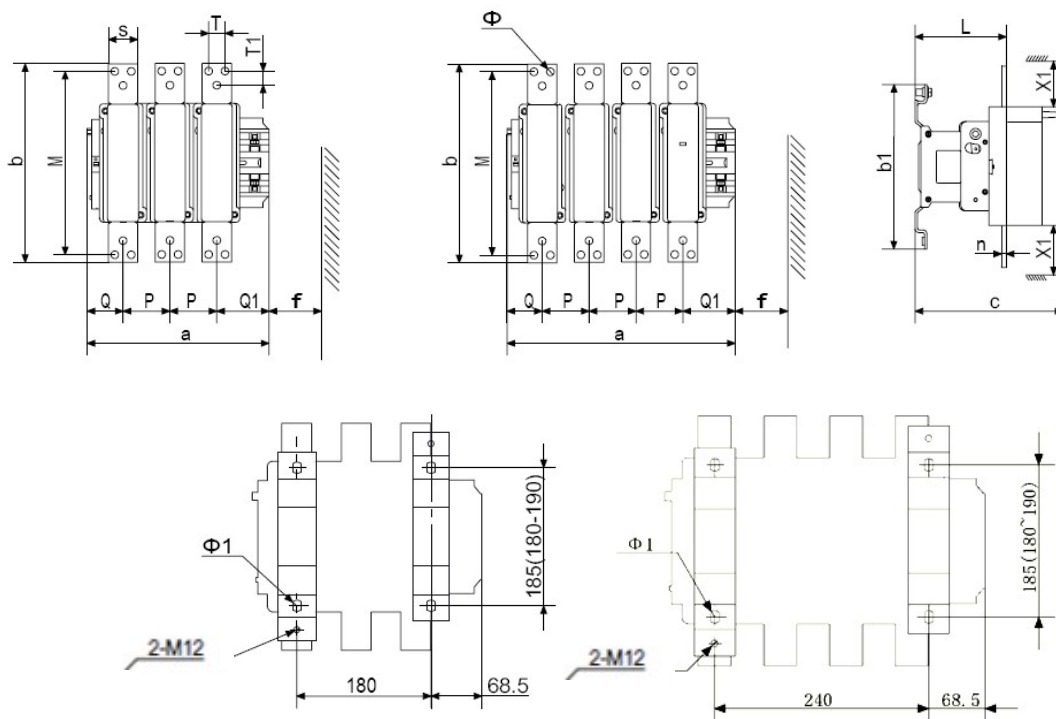
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Unit: mm

NDC1	a	p	Q	Q1	S	Φ	f	b	b1	M	N	c	n	L	G	Φ1	Z	Y	X1	
																			≤500V	>500 V
630	309	80	60	89	40	13	201	304	280	264	202	255	8	155	180(100-195)	10.5	60.5	68.5	20	30
6304	389	80	60	89	40	13	201	304	280	264	202	255	8	155	240(150-275)	10.5	60.5	88.5	20	30

7.4 NDC1-800 Outline and installing dimensions



Unit: mm

NDC1	a	p	Q	Q1	S	T	T1	Φ	f	b	b1	M	c	L	Φ1	n	X1	
																	≤500V	>500 V
800	309	80	60	89	50	28	24	13	151	338	280	312	251	155	10.5	8	20	30
8004	389	80	60	89	50	28	24	13	151	338	280	312	251	155	10.5	8	20	30

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

The P, Q1, S, T, T1, Φ, M, L, Φ1, 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

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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

Contactor products are supplied with optional accessories. If accessories are not required, it is not necessary to select them. Currently, NDC1-115~800 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.

NF1 Auxiliary contact:

Auxiliary contact	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							
	Protection class		IP20							
	Minimum connected load		17V 5mA							
	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 ²						
		Hard wire	1 piece/2 pieces	4.0mm ²						
		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		
	Protection class		IP65 (terminal IP20)		
	Installation type		top		
	Contact type		1NC 1NO		
	Rated operating current	24V	0.1A		

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	AC-15/DC-13		50V	0.05A
life		Mechanical life, maximum frequency		1,000,000 times, 1200 • h ⁻¹
		Electrical life, maximum frequency		700,000 times, 900 times • h ⁻¹ (DC-13、AC-15)
Connection capacity		cord: 1 piece/2 pieces		0.75~2.5mm ²
		Hard wire: 1 piece/2 pieces		1~4.0mm ²
		Tightening torque		0.8~1.2N.m

NS1 Time delay auxiliary contact:

Time delay auxilia ry contact	Type		NS1					
	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		24V 10mA					
	Protection class		IP20					
	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	±5%					
	Connection capacity	cord	1 piece/2 pieces	2.5mm ²				
		Hard wire	1 piece/2 pieces	4.0mm ²				
		Tightening torque		.8~1.2N.m				

F2-11/22DS/C1 Auxiliary contact:

Uimp		1.5 kV
Ui		AC100V, 50Hz
Contact type		F2-22DS/C1: 2NO+2NC F2-11DS/C1: 1NO+1NC
W		10
Minimum connected load		5V/5mA
Capacity of contact	DC-12	DC50V, 0.1A
	AC-12	AC50V, 0.1A, 50Hz
Mechanical life (3600 次/h)		100 万次
Electrical life (1200 次/h)		70 万次

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Recommended time of system acquisition delay when auxiliary contact indicates the working state of contactor		50ms
Connection capacity /mm ²	Minimum hard wire without terminal:1/2	1/1
	Maximum hard wire without terminal:1/2	2.5/2.5
	Minimum1/2flexible cords without terminal blocks	1/1
	1/2 flexible cords without terminal blocks	2.5/2.5
Tightening torque	Normal	0.8N.m
	Limit	1.2N.m
Protection capability		触头密封，可防护 75 μm 及以上粒径的粉尘。

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% ◆ The maximum voltage is limited to 3 Uc 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).
	G1-02R/C1-2650	AC50~110V	
	G1-03R/C1-2650	AC127~240V	
	G1-04R/C1-2650	AC250~440V	
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 2Uc. ◆ 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	

F1-22DS/C1 Auxiliary contact: :

Impulse withstand voltage Uimp	NC:6kV; NO:2.5 kV
Rated insulation voltage Ui	NC: 690V; NO: 250V
Contact type	2NO+2NC

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Agreed thermal current Ith ($\leq 60^{\circ}$)		NC:10A; NO:0.1A
Minimum connected load		NC: DC 17V/5mA; NO:DC5V/10mA
Protection class	NC	IP20
	NO	IP67
NC	AC-15	380V~, 0.95A
		480V~, 0.5A
	DC-13	220V-, 0.15A
NO	DC-12	30V-, 0.1A
	AC-12	125V~, 0.1A
Life	Mechanical life, maximum frequency	400,000 times, 3600 times $\cdot h^{-1}$
	Electrical life, maximum frequency	100,000 times, 1200 times $\cdot h^{-1}$
接线能力	cord: 1 piece/2 pieces	1~2.5mm ²
	Hard wire: 1 piece/2 pieces	1~4.0mm ²
	Tightening torque	0.8~1.2N.m

10.2 Ordering and delivery list

The following information shall be provided during ordering:

A full range of models and specifications, ordering quantity.

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

Example: NDC1-630 AC220V 50/60Hz+NF1-22, 10 sets.

The product delivery list contains the following information:

NDC1-115~500 product:

Product body×1, grounding screws of the main circuit×6sets, rounding screw ×1 set, user manual×1.

NDC1-630, 800 product:

Product body×1, grounding screws of the main circuit×6sets, rounding screw ×1 set, phase insulated partitions ×4, 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

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- 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.