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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/690 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

ND C 1 — □ □ □ □ + □

- Optional accessories: Refer to 10.1 for details
- Voltage specifications: Refer to 4.2 for the detailed optional voltage specifications
- Coil type code: "AC" coil; "DC" coil; Wide voltage coil for "AC/DC"
- Main circuit pole types: "3" stands for 3 poles, not marked; "4" stands for 4 poles
- Rated current: Working current under the AC-3 category and voltage of 415V
- Design code: 1
- Product code: AC Contactor
- Enterprise code: " Nader " brand low-voltage electrical appliance

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	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
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)									
Short time withstand current (starting from the cold state, θ≤40℃, no current 60 minutes before)		1s	1100	1200	1500	1800	2200	2650	3600	4200	5050	5500
		10s	640	700	920	1000	1230	1800	2400	3200	4400	4600
		30s	520	600	740	850	950	1300	1700	2400	3400	3600
		1min	400	450	500	560	620	900	1200	1500	2200	2600
		10min	320	350	400	440	480	750	1000	1200	1600	1700
Mechanical life			300×10⁴(≤1200 times/h)						100×10⁴(≤600 times/h)			
AC-1	Electrical life		40×10⁴	40×10⁴	40×10⁴	40×10⁴	35×10⁴	35×10⁴	30×10⁴	20×10⁴	20×10⁴	20×10⁴
	Operating frequency h⁻¹		200	200	200	200	150	150	150	100	100	100
AC-3	Electrical life		80×10⁴	80×10⁴	50×10⁴	50×10⁴	50×10⁴	50×10⁴	30×10⁴	20×10⁴	20×10⁴	10×10⁴
	Operating frequency h⁻¹		300				150					
AC-4	Electrical life		15×10⁴						8×10⁴		5×10⁴	3×10⁴
	Ooperating frequency h⁻¹		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/mm²	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	contactor opened (gn)		9		7		6		6	9		6

sine wave =11ms	contactor closed (gn)	15	15	15	15	15	15
Anti-vibration	contactor opened (gn)	2	2	2	1.5	2	2
performance 8…30 Hz	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、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	
		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					
	48~132V AC/DC	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	
	100~250V AC/DC	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				NDC1-400	NDC1-500	NDC1-630	NDC1-800
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）
		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			
	48~132V 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	
	100~250V 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/mm ²		1piece /2pieces	2.5			
	Hard wire /mm ²		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℃（note1）。

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		NDC1-115	NDC1-150	NDC1-185	NDC1-225	NDC1-265	NDC1-330	NDC1-400	NDC1-500	NDC1-630	NDC1-800
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℃）

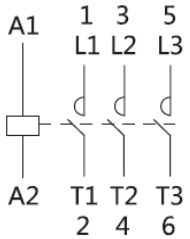
Elevation(meter)	Current capacity coefficient	Voltage capacity coefficient
3000	1	1
3500	0.9	0.92
4000	0.8	0.9
4500	0.7	0.88
5000	0.6	0.86
>5000	Not allowed	Not allowed

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**



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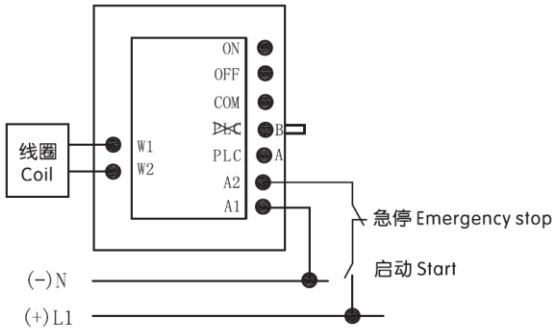
6.2 **Wiring control plan of the wide voltage coil**

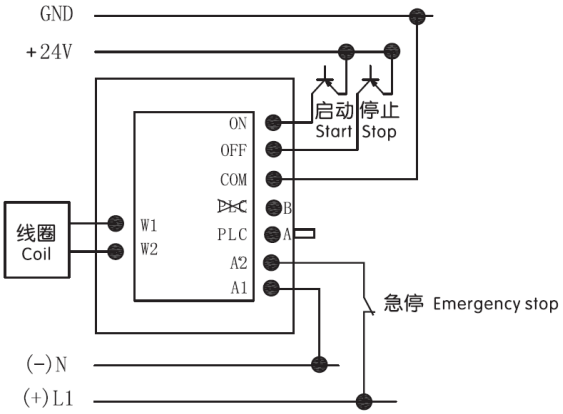
（1）Turn the dial switch to PLC B for control of power supply sides A1-A2, and perform control according to the control logic with the control diagram shown below:



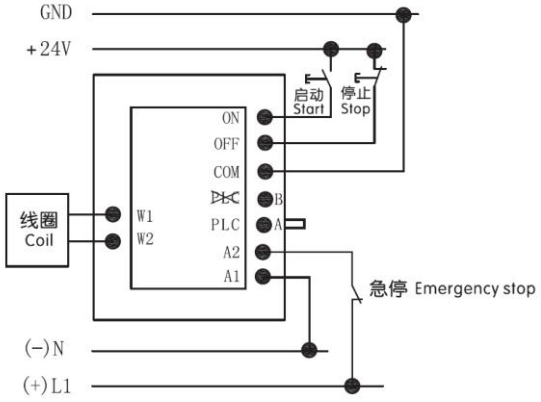
（2）PLC control

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:

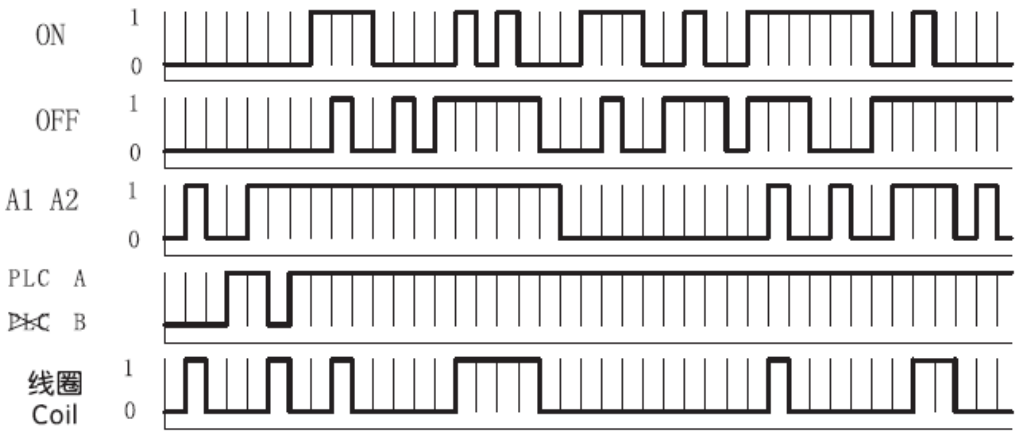
Note: PLC adopts the relay output type or transistor-source output type.



（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:



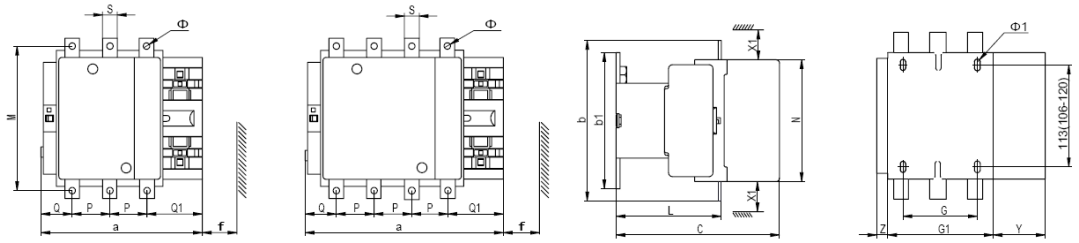
Control coil control logic wave form



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

7、Outline and installing dimensions

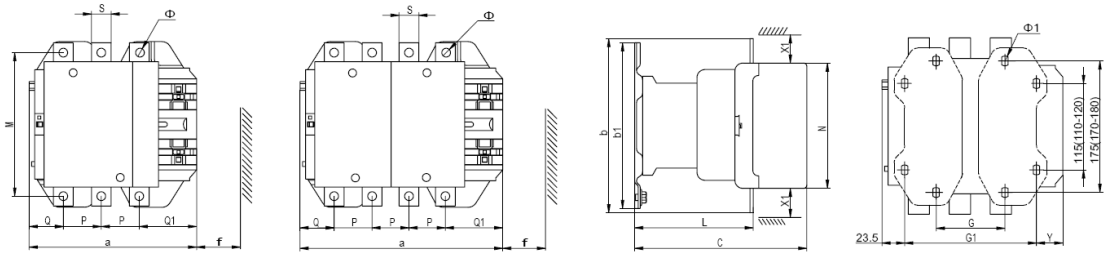
7.1 NDC1-115～330 Outline and installing dimensions



Unit：mm

NDC1	a	p	Q	Q1	S	Φ	f	b	b1	M	N	c	L	n	G	Φ1	G1	Z	Y	X1	
																				≤500V	>500 V
115	163.5	37	29.5	60	15	6.5	131	162	137	147	124	171	107	3	80	6.5	106	13.5	44	10	15
1154	200.5	37	29.5	60	15	6.5	131	162	137	147	124	171	107	3	80	6.5	143	13.5	44	10	15
150	163.5	40	26	57.5	20	9	131	170	137	150	124	171	107	3	80	6.5	106	13.5	44	10	15
1504	200.5	40	25	55.5	20	9	131	170	137	150	124	171	107	3	80	6.5	143	13.5	44	10	15
185	168.5	40	29	59.5	20	9	130	174	137	154	127	181	113.5	3	80	6.5	111	13.5	44	10	15
1854	208.5	40	29	59.5	20	9	130	174	137	154	127	181	113.5	3	80	6.5	151	13.5	44	10	15
225	168.5	48	21	51.5	25	11	130	197	137	172	127	181	113.5	3	80	6.5	111	13.5	44	10	15
2254	208.5	48	17	47.5	25	11	130	197	137	172	127	181	113.5	3	80	6.5	151	13.5	44	10	15
265	201.5	48	39	66.5	25	11	147	203	145	178	147	213	141	4	96	6.5	140	20.5	38	10	15
2654	244.5	48	34	66.5	25	11	147	203	145	178	147	213	141	4	96	6.5	186	20.5	38	10	15
330	213	48	43	74	25	11	147	206	145	181	158	219	145	4	96	6.5	154.5	20.5	38	10	15
3304	261	48	43	74	25	11	147	206	145	181	158	219	145	4	96	6.5	202.5	20.5	38	10	15

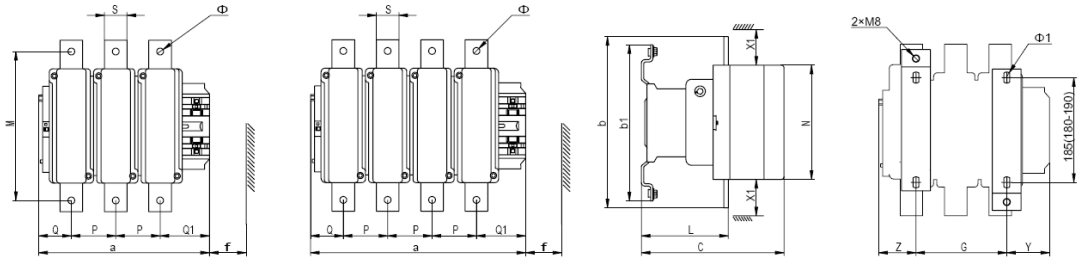
7.2 NDC1-400～500 Outline and installing dimensions



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

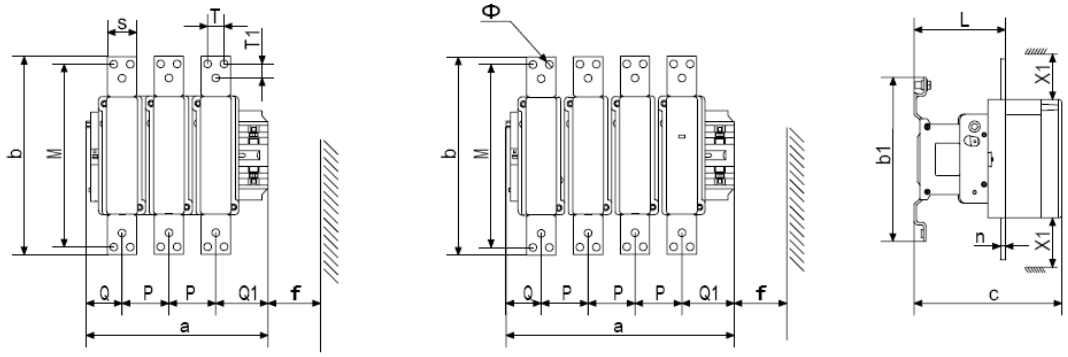
7.3 NDC1-630 Outline and installing dimensions

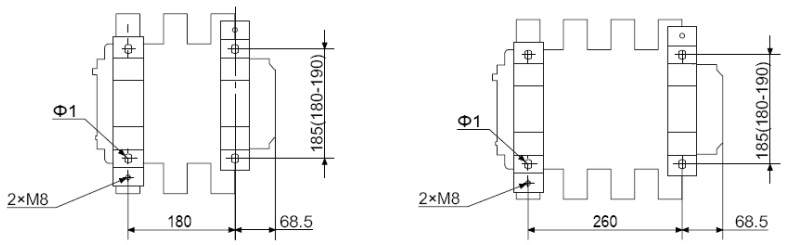


Unit: mm

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 ventilation and the temperature between -60℃ and +80℃. 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.

NF1Auxiliary 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						
Au	Minimum connected load		17V 5mA				12V 11mA		
xili	Installation type		top						
ary	Contact type	code	11	20	02	40	31	13	04	22
con		Contact number NO	1	2	0	4	3	1	0	2
tact		Contact number NC	1	0	2	0	1	3	4	2

	Connection capacity	cord	1 piece/2 pieces	2.5mm²
		Hard wire	1 piece/2 pieces	4.0mm²
		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 AC-15/DC-13	24V	0.1A
		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	0.75～2.5mm²
		Hard wire：1 piece/2 pieces	1～4.0mm²
		Tightening torque	0.8～1.2N.m

NS1 Time delay auxiliary contact:

Time delay auxiliary 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					
	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	cord 1 piece/2 pieces	2.5mm²					

	capacity	Hard wire	1 piece/2 pieces	4.0mm²
		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% ◆ 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	

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

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 ±5°;

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.