Technical Construction File

EN IEC 60947-4-1:2019

Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters

TCF Reference No..... :	TLZJ24073060646
Prepared by (+ signature)..... :	Stephen Zhang / Testing Engineer .....
Approved by (+ signature)..... :	Cosco Yu / Technical Manager .....
Date of issue..... :	August 23, 2024
The third party..... :	Shanghai Global Testing Services Co., Ltd.
Address..... :	Floor 2nd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.
Reviewing procedure ..... :	CE
Applicant's name..... :	Zhejiang Changcheng Trading Co., Ltd.
Address..... :	DianHou Village, Liushi Town, Yueqing City, Zhejiang, China
Manufacturer's name..... :	Changcheng Electrical Group Zhejiang Technology Co., Ltd.
Address..... :	DianHou Village, Liushi Town, Yueqing City, Zhejiang, China
Factory's name..... :	The same as manufacturer
Address..... :	The same as manufacturer
TCF specification:	
Standard..... :	EN IEC 60947-4-1:2019
Non-standard TCF method…….. :	N/A
Review item description..... :	AC Contactor
Trade Mark..... :	/
Model/Type reference..... :	CJX2-D0910,CJX2-D0901,CJX2-D1210,CJX2-D1201,CJX2-D1810, CJX2-D1801,CJX2-D2510,CJX2-D2501,CJX2-D3210,CJX2-D3201, CJX2-D4011,CJX2-D5011,CJX2-D6511,CJX2-D8011,CJX2-D9511, CJX2-D115,CJX2-D150,CJX2-D170,CJX2-09004,CJX2-09008, CJX2-12004,CJX2-12008,CJX2-25004,CJX2-25008,CJX2-40004, CJX2-40008,CJX2-50004,CJX2-50008,CJX2-65004,CJX2-65008, CJX2-80004,CJX2-80008,CJX2-95004,CJX2-95008,CJX2-0901Z, CJX2-0910Z,CJX2-1201Z,CJX2-1210Z,CJX2-1801Z,CJX2-1810Z, CJX2-2501Z,CJX2-2510Z,CJX2-3201Z,CJX2-3210Z,CJX2-4011Z, CJX2-5011Z,CJX2-6511Z,CJX2-8011Z,CJX2-9511Z
Main inspection model..... :	CJX2-D0910
Ratings ……..……. :	/

Review item particulars(for the Electrical Equipment)..... :	
Classification of installation and use.....:	Stationary
Supply Connection.....:	Terminal
Electrical safety class..... :	/
IP number..... :	/
Switch.....:	Yes
Thermostat.....:	No
Thermal cut-out..... :	No
Electronic circuit..... :	\
Timer..... :	No
Heating elements.....:	No
Motor..... :	No
Low voltage motor..... :	No
Accessories provided..... :	Yes
Portable appliance.....:	No
Attachment type..... :	No
Possible review case verdicts:	
-review case does not apply to the test object..... :	N/A
- review object does meet the requirement..... :	P(Pass)
- review object does not meet the requirement.....:	F(Fail)
Reviewing.....:	
Date of receipt of review item.....:	July 30, 2024
Date (s) of performance of reviews..... :	July 30, 2024 to August 23, 2024

General remarks:

The review results presented in this report relate only to the object reviewed.
This report shall not be reproduced, except in full, without the written approval of the Issuing the third party
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

General product information:

AC Contactor
CJX2-D0910

Review condition:
Temperature: 25°C
Relative humidity: 60%
The review sample was a pre-production sample.

Copy of marking plate and summary of review results (information/comments):

Summary of reviewing:

-The reviewed sample is found to comply with EN IEC 60947-4-1:2019.

General notes on tests:

This review report include the following page(s):

National deviation of EU have been considered.

Annex I: Photo Documentation, 2 page(s).

6.2	**MARKING**		**-**
	Data shall be preferably marked on the equipment:		-
	a – manufacturer's name or trade mark	Changcheng Electrical Group Zhejiang Technology Co., Ltd.	P
	b – type designation or serial number	CJX2-D0910	P
	c - number of this standard, if the manufacturer claims compliance	IEC 60947	P
	k - IP code, in case of an enclosed equipment		N
	Data shall be included on the nameplate, or on the equipment, or in the manufacturer's published literature:		P
	d – rated operational voltages		P
	e - utilization category and rated operational currents (or rated powers), at the rated operational voltages of the equipment		P
	f - either the value of the rated frequency/ies, or the indication d.c. (or symbol) ..... :		N
	g - rated duty with the indication of the class of intermittent duty, if any		P
	Associated values:		P
	h - rated marking and breaking capacities (these indications may be replaced, where applicable, by the indication of the utilization category, see table 7)		P
	Safety an installation:		P
	i – rated insulation voltage		P
	j – rated impulse withstand voltage		P
	l – pollution degree		P
	m – rated conditional short-circuit current and type of co-ordination of contactor or starter and type, current rating and characteristics of the associated SCPD:		P
	m – rated conditional short-circuit current of the combination starter or the protected starter		P
	n – switching overvoltages		P
	Control circuits		P
	The following information concerning control circuits shall be placed either on the coil or on the equipment:		P

	o – rated control circuit voltage (Uc), nature of current and rated frequency		P
	p - if necessary, nature of current, rated frequency and rated control supply voltages (Us)		P
	Air supply systems for starter or contactors operated by compressed air		P
	Q – rated supply systems of the compressed air and limits of variation of this pressure, if they are different from those specified in 8.2.1.2		N
	Auxiliary circuits:		-
	r – ratings of auxiliary circuits		N
	Overload relays and releases:		N
	s – characteristics according to 5.7		N
	Additional information for certain types of contactor and starter:		N
	Rheostatic starters:		N
	t – circuit diagram		N
	u – severity of start, see 5.3.5.5.1		N
	v – starting time, see 5.3.5.5.1		N
	Auto-transformer starters:		-
	w – rated starting voltage(s), i.e. voltage(s) at the tapping terminals		N
	Vacuum contactors and starters:		N
	x – maximum permissible altitude of the site of installation, if less than 2000 m		N
	EMC		-
	y – environment B or A: see 7.3.1 of part 1		P
	z – special requirements, if applicable, for example shielded or twisted conductors		P
	Sub clause 5.2 of part 1 applies to contactors, starters and overload relays with the following additions:		-
	Data under items d) to x in 6.1.2 shall be included on the nameplate or on the equipment or in the manufacturer’s published literature:		P
	In case of electronically controlled electromagnets, information other than given in o) and p) of 6.1.2 may also be necessary: see 5.5 and annex E		P

	Data under items c) and k) in 6.1.2 shall preferably be marked on the equipment		P

6.3	**Instruction for installation, operation and maintenance**		**-**
	The manufacture shall specify, in his documents or catalogues:		P
	- the conditions for installation, operation and maintenance, if any, of the equipment during operation and after a fault		P
	- the specify the measures to be taken with regard to EMC, if any,		P
	- equipment only suitable in environment A shall provided with the following notice		P
	- if necessary, the instructions for transport, installation and operation of the equipment shall indicate the measures that are particular importance for the proper and correct installation, commissioning and operation of the equipment.		P
	- manufacturer advice on the measures to be taken in the event of a short-circuit		P
	In case of protected starters (see 3.2.8), the manufacturer shall also provide the necessary mounting and wiring instruction		P

8.1	**CONSTRUCTION**		
8.1.1	Materials (see 7.1.1)		P
	Resistance to abnormal heat and fire (according to 7.1.1.1 of IEC 60947-1) of insulating current-carrying parts		P

7.10	Resistance to heat		
	CB sufficiently resistant to heat		P
9.14	**Test of resistance to heat**		
9.14.1	Test:		P
	- without removable covers..... 1 h (100 ± 2) °C		P
	- removable covers..... 1 h (70 ± 2) °C		P

	After the test no access to live parts, marking still legible		P
9.14.2	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = 125°C Ø of impression ≤ 2 mm		P
8.14.3	Ball pressure test for external parts of insulating material (parts not retaining current-carrying parts and parts of the protective circuit in position T = (70 ± 2)°C or T = ___ °C = (40 ± 2)°C + max. temperature rise of sub-clause 8.8 Ø of impression ≤ 2 mm		P
8.11	Resistance to abnormal heat and to fire		-
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	Resistance to abnormal heat and to fire		-
	Glow wire test: No visible flame, no sustained glowing or flames and glowing extinguish within 30 s		P
	external parts retaining current-carrying parts and parts of the protective circuit in position..... (960 ± 15)°C		P
	all other external parts ..... (650 ± 10)°C		P
8.12	Resistance to rusting		-
	Ferrous parts adequately protected against rusting		P
9.16	Test of resistance to rusting:		P
	- 10 min immersed in a cold chemica		P
			P
	No sign of rust		P

8.1.2	Current-carrying parts and their connection (see 7.1.2)		P
8.1.3	**CLEARANCES AND CREEPAGE DISTANCES**		P
	CLAUSE 7.1.3 OF IEC 60947 APPLIES		**P**
7.1.3	Clearances		P
	Rated impulse withstand voltage		P
	Creepage distances		P
	Pollution degree ..... :		—
	Comparative tracking index (V) ..... :		—

	Material group .....:		—
	Rated insulation voltage Ui (V) .....:		—
	Minimum creepage distances (mm) ..... :		—
	Measured creepage distances (mm) .....:		P
	In case Uimp is not indicated		P
8.1.4	**Actuator**		P
	Sub-clause 7.1.4 of part 1 applies when the actuator is manually operated with the following addition:		—
	The operating handle of the manually operated switching device of combination starter shall be provided with means for padlocking it in the OFF position.		P
8.1.4.1	Insulation		P
8.1.4.2	Direction of movement		P
8.1.4.3	Mounting		P
	Actuators mounted on removable panels or opening doors are so designed that when the panels are replaced or doors closed the actuator will engage correctly with the associated mechanism		P
8.1.5	**INDICATION OF CONTACT POSITION**		-
8.1.5.1	Indication means, see 7.1.5.1 part 1 applies to manually operated starters		P
8.1.5.2	Indication by the actuator, see 7.1.5.1 part 1		P
8.1.6	**Additional safety requirements for equipment suitable for isolation,** see clause 7.1.6.1 part 1 applies and the additions marked with *)		-
7.1.6.1	Additional constructional requirements:		P
	- marking according to 5.2.		P
	- indication of the position of the contacts		P
	- construction of the actuating mechanism		P
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) .....:		—
	- measured clearances (mm) .....:		P
	- test Uimp across gap (kV) ..... :		P
	*) Devices provided with positions like trip position or stand-by positions which are not the indicated open position shall be clearly marked.		P

	*) An indicator having only one position of rest shall not be considered as appropriate to indicate the position of the main contact.		P
8.1.6.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		-
	Auxiliary switch is rated according to IEC 60947-5-1 (unless the equipment is rated AC-23)		P
	Time interval between opening of the contacts of the auxiliary contact and the contacts of the main poles: =20 ms ..... :		—
	Measured time interval (ms) ..... :		P
	During the closing operation the contacts of the auxiliary switch closes after or simultaneously with the contacts of the main poles		P
8.1.6.3	Supplementary requirements for equipment provided with means for padlocking the open position:		P
	The locking means is so designed that it cannot be removed with the appropriate padlock(s) installed		p
	Test force F applied to the actuator in an attempt to operate to the closed position (N) .....:		—
	Rated impulse withstand voltage (kV) ..... :		—
	Test Uimp on open main contacts at the test force		P
8.1.7	**Terminals**		-
7.1.7.1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength	(see 8.2.4 below)	P
	Terminal connections shall be such that necessary contact pressure is maintained	(see 8.2.4 below)	P
	Terminals shall be so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal	(see 8.2.4 below)	P
	Terminal shall not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage shall not be reduced below the rated value	(see 8.2.4 below)	P
	If required by application, terminals and conductors may be connected by means of cable lugs for copper conductors only		P
8.2.4	**Mechanical properties of terminals**		**-**

8.2.4.2	Mechanical strength of terminals		P
	maximum cross-sectional area of conductor (mm²) .....:		-
	diameter of thread (mm) .....:		-
	torque (Nm) ..... :		-
	5 times on 2 separate clamping units		-
8.2.4.3	Testing for damage to and accidental loosening of conductor (flexion test)		-
	conductor of the smallest cross-sectional area (mm²) .....:		-
	number of conductor of the smallest cross section .....:		-
	diameter of bushing hole (mm) ..... :		
	height between the equipment and the platen (mm) ..... :		-
	mass at the conductor(s) (kg) .....:		-
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
8.2.4.4	Pull-out test		P
	force (N) ..... :		
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Flexion test		P
	conductor of the largest cross-sectional area (mm²) .....:		-
	number of conductor of the largest cross-sectional .....:		-
	diameter of bushing hole (mm) ..... :		-
	height between the equipment and the platen (mm) ..... :		-
	mass at the conductor(s) (kg) .....:		-
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		P
	force (N) ..... :		-

	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Flexion test		P
	conductor of the largest and smallest cross-sectional area (mm²) .....:		-
	number of conductor of the smallest cross sectional, number of conductor of the largest cross sectional .....:		-
	diameter of bushing hole (mm) .....:		-
	height between the equipment and the platen (mm) .....:		-
	mass at the conductor(s) (kg) .....:		-
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit		P
	Pull-out test		P
	force (N) .....:		-
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
7.1.7.2	Connecting capacity		P
	type of conductors .....:		-
	minimum cross-sectional area of conductor (mm²) .....:		-
	maximum cross-sectional area of conductor (mm²) .....:		-
	number of conductors simultaneously connectable to the terminal .....:		-
7.1.7.3	Connection		P
	terminals for connection to external conductors shall be readily accessible during installation		P
	clamping screws and nuts shall not serve to fix any other component		P
8.1.7.4	**Terminal identification and marking,**		P
8.1.7.4	Subclause 7.1.7.4 of part 1 applies with the additional requirements of annex A		P

	terminal intended exclusively for the neutral conductor		P
	protective earth terminal		P
	other terminals		P
8.1.8	**Additional requirements for equipment provided with a neutral pole**		-
	Subclause 7.1.8 of part 1 applies		P
	marking of neutral pole		P
	The switched neutral pole shall not break before and shall not make after the other poles		P
	Conventional thermal current of neutral pole		P
	If a pole having an appropriate short-circuit breaking and making capacity is used as a neutral pole, then all poles, including the neutral pole, may operate substantially together.		P
	Equipment having a value Ith < 63 A, this value shall be identical for all poles		P
	For Ith > 63 A, the neutral pole may have a value of Ith different from that of the other poles, but not less than the half that value or 63 A, whichever is the higher.		P
8.1.9	**Provisions for protective earthing**		-
	Subclause 7.1.9 of part 1 applies		P
7.1.9.1	The exposed conductive parts shall be electrically interconnected and connected to a protective earth terminal		P
7.1.9.2	The protective earth terminal shall be readily accessible		P
	The protective earth terminal shall be suitably protected against corrosion		P
	The electrical continuity between the exposed conductive parts of the protective earth terminal and the metal sheathing of connecting conductors		P
	The protective earth terminal shall have no other functions		P
7.1.9.3	Protective earth terminal marking and identification		P

8.1.10	**Enclosure for equipment**		-
7.1.10.1	Design		-
	Subclause 7.1.9 of part 1 applies with the follow additions		P
	Starting resistors mounted within an enclosure shall be so located or guarded that issuing heat is not detrimental to other apparatus and materials within the enclosure.		P
	For the specified case of combination starters, the cover or door shall be interlocked so that it cannot be opened without manually operated device being in open position.		P
	However, provision may be made to open the door or cover with the manually operated switching device in the ON position by use of a tool.		P
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		P
	Sufficient space shall be provided inside the enclosure		P
	The fixed parts of a metal enclosure shall be electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		P
	Under no circumstances shall a removable metal part of the enclosure be insulated from the part carrying the earth terminal when the removable part is in place		P
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		P

	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means shall be provided to prevent loss of the fastening devices		P
7.1.10.2	Insulation		-
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining shall be securely fixed to the enclosure		P
8.1.11	**Degree of protection of enclosed contactors and starters**		N
	Subclause 7.1.11 of part 1 applies		N
	Degree of protection ..... :		N
	Test for first characteristic		N
	Test for first numeral .....:		—
			-
	Test for second numeral ..... :		—

9.3.1.a	**TEST SEQUENCE I**		**-**
	- verification of temperature rise (Clause 9.3.3.3.)		**P**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**P**
9.3.3.3	**Temperature rise**		P
	Subclause 8.3.3.3. of part 1 applies		-
	ambient temperature 10-40 °C ..... :		—
	Contactor		-
	test enclosure W x H x D (mm x mm x mm) ..... :		—
	material of enclosure ..... :		—
9.3.3.3.4	Main circuits, test conditions:		-
	Subclause 8.3.3.4 of part 1 applies with following addition		-
	loaded as stated in 8.2.2.4		-
	- setting of the maximum current setting..... :		-
	- setting overload relay..... :		-
	- conventional thermal current Ith (A) .....:		—
	- conventional enclosed thermal current Ithe (A) . :		—
	- cable/busbar cross-section (mm²) / (mm) ..... :		—
	- temperature rise of main circuit terminals (K) .... :	<	—
9.3.3.3.5	Control circuit, test conditions:		-
	Subclause 8.3.3.5. of part 1 applies with following addition		-
	The temperature rise shall be measures during the test of 9.3.3.3.4		-
	- conventional thermal current Ith (A) at their rated voltage.....:		-
	- conventional enclosed thermal current Ithe (A) . :		-
	- cable/busbar cross-section (mm²) / (mm) ..... :		-
	- temperature rise of control circuit (K) ..... :	<	P
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		-
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		P
	The temperature rise shall be measures during the test of 9.3.3.3.4		P
	- rated control supply voltage Us (V) .....:		—

	- class of insulating material .....:		—
	- uninterrupted or eight-hour duty windings		P
	- temperature rise of control circuit terminals (K) . :		P
	b) Intermittent duty windings (8.2.2.6.2)		P
	- no current flowing though the main circuit		P
	- rated control supply voltage Us (V) .....:		—
	- class of insulating material .....:		—
	- intermittent duty class.....:		P
	- close open operating cycle.....:		P
	- on-load factor.....:		P
	- temperature rise of control circuit terminals (K) . :	<40	P
	c) temporary or periodic duty (8.2.2.6.3)		P
	- no current flowing though the main circuit		P
	- rated control supply voltage Us (V) .....:		—
	- class of insulating material .....:		—
	- close open operating cycle.....:		P
	- on-load time.....:		P
	- temperature rise of control circuit terminals (K) . :		P
9.3.3.3.7	Auxiliary circuit, test conditions:		P
	Normally loaded with their maximum rated operational current at any convenient voltage		P
	The temperature rise shall be measures during the test of 9.3.3.3.4		P
	- conventional thermal current Ith (A).....:		P
	- conventional enclosed thermal current Ithe (A) . :		P
	- cable/busbar cross-section (mm²) / (mm) .....:		P
	- cable cross-section (mm²) .....:		—
	- temperature rise of auxiliary circuit terminals (K) .....:		P
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		P
	Normally loaded with their current value I_m		P
	Number of starts per hour.....:		P
	Rated duty.....:		P
	Starting characteristic		P
	- cable/busbar cross-section (mm²) / (mm) .....:		P
	- cable cross-section (mm²) .....:		P

	- temperature rise of starting resistor terminals (K) ..... :	See table 3 of part 1	P
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	P
	- temperature rise of issuing air (K)	See table 3 of part 1	P
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		P
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{\text{Ue}}$		P
	Number of starts per hour..... :		P
	Rated duty..... :		P
	Starting characteristic..... :		P
	- cable/busbar cross-section (mm²) / (mm) ..... :		P
	Temperature rise of:		P
	- windings (K)	See table 5 (+15 %)	P
	- operating means (K) ..... :	See table 3 of part 1	P
	- parts intended to be touched but not hand held (K)	See table 3 of part 1	P
	- parts which need not be touched during normal operation (K)	See table 3 of part 1	P

9.3.3	**Performance under no load, normal load and overload conditions**		-
9.3.3.1	**Operation**		-
	For starter only:		P
	reference ambient temperature(i.e. +20 °C :		P
	Rated full load current (A) :		P
	No tripping after 3 operations when stator has reached thermal equilibrium at minimum and maximum settings		P
	For overload relay with combined stop and reset actuating mechanism only		P
	With closed contactor, the resetting mechanism shall be operated and this shall cause the contactor drop out		P
	For overload relay with either a reset or separate stop and reset mechanism only		P
	With closed contactor and resetting mechanism in the reset position, the tripping mechanism shall be operated and the contactor shall have been caused to drop out		P

9.3.3.2	**OPERATING LIMITS**		-
9.3.3.2.1	Power-operated equipment:		P
8.2.1.2.1	Electromagnetic contactors and starters		P
	rated control supply voltage Us (V) ..... :		—
	frequency (Hz) ..... :		—
	declared ambient temperature(>40 °C) for 100% Us.....:		P
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:		P
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:		P
	ambient temperature(-5 °C) for 100% Us		P
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:		P
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:		P
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		P
	Rated control supply voltage Us (V) .....:		—
	Frequency (Hz) ..... :		—
	Declared ambient temperature(>40 °C) for 100% Us		P
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:		P
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:		P
	Ambient temperature(-5 °C) for 100% Us		P
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:		P
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:		P
8.2.1.2.3	Electro-pneumatic contactors and starters		P
	Rated air supply pressure(Bar) ..... :		—

	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure(Bar)		P
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar) .....:		P
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar) .....:		P
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)		P
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar) :		P
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) .....:		P
8.2.1.2.4	Capacitive drop out test		P
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being = 3 m.		P
s	The capacitor is short-circuit by a switch of neglible impedance.		P
	The supply voltage shall then be adjusted to 110 % U_s.....:		P
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) .....:		P
	Verification of the drop out of the contactor when the switch is operated to the open position.....:		P
9.3.3.2.2	Relays and releases		-
8.2.1.3	Operation of under-voltage relays and releases		P
	type of under-voltage relay ..... :		P
	Rated control supply voltage(U).....:		P
	Frequency (Hz).....:		P
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :		P
	Prevent to close if supply voltage < 35 % of the rated voltage.....:		P
	Limits of close satisfactorily at any value between 85 % and 110 %.....:		P

8.2.1.4	Shunt-coil operated releases (shunt trip)		-
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency.....:		**P**
8.2.1.5	Conditions for thermal and time-delay magnetic overload relays only:		**P**
8.2.1.5.1	Limits of operation of time-delay overload relays when all poles are energized		**P**
	type of time-delay overload relay ..... :		-
	trip class ..... :		-
	current setting .....:		-
	ambient temperature (°C) ..... :		-
	test enclosure W x H x D (mm x mm x mm) .....:		-
	cable/busbar cross-section (mm²) / (mm) ..... :		-
	at A times of current setting, tripping shall not occur in less than 2 h starting from the cold state; test current ..... :		-
	when the current is subsequently raised to B times the current setting, tripping shall occur in less than 2 h; test current .....:		-
	for class 10A overload relays energized at C times the current, tripping shall occur in less than 2 min, starting from thermal equilibrium at the current setting; test current .....:		-
	For class 10, 20 or 30 overload relays energized at C times the current, tripping shall occur in less than 2, 8 or 12 min, starting from thermal equilibrium at the current setting; class; test current; tripping time .....:		-
	At D times the current setting, tripping shall occur within the tripping time (s) < Tp <, starting from the cold state; test current; tripping time Tp (s) ....:		-
	ambient temperature: - 5 °C .....:		P
	at A times of current setting, tripping shall not occur in less than 2 h starting from the cold state; test current .....:		-
	when the current is subsequently raised to B times the current setting, tripping shall occur in less than 2 h; test current .....:		-

	for class 10A overload relays energized at C times the current, tripping shall occur in less than 2 min, starting from thermal equilibrium at the current setting; test current .....:		-
	for class 10, 20 or 30 overload relays energized at C times the current, tripping shall occur in less than 2, 8 or 12 min, starting from thermal equilibrium at the current setting; class; test current; tripping time .....:		-
	at D times the current setting, tripping shall occur within the tripping time (s) < Tp <, starting from the cold state; test current; tripping time Tp (s) ....:		-
	ambient temperature: + 40 °C .....:		-
	at A times of current setting, tripping shall not occur in less than 2 h starting from the cold state; test current .....:		-
	when the current is subsequently raised to B times the current setting, tripping shall occur in less than 2 h; test current .....:		-
	for class 10A overload relays energized at C times the current, tripping shall occur in less than 2 min, starting from thermal equilibrium at the current setting; test current .....:		-
	for class 10, 20 or 30 overload relays energized at C times the current, tripping shall occur in less than 2, 8 or 12 min, starting from thermal equilibrium at the current setting; class; test current; tripping time .....:		-
	at D times the current setting, tripping shall occur within the tripping time (s) < Tp <, starting from the cold state; test current; tripping time Tp (s) ....:		-
	Limits of operation of three-pole thermal overload relays energized on two poles:		-
	ambient temperature (°C) .....:		-
	the relay energized on three poles, at A times the current setting, tripping shall not occur in less than 2 h, starting from the cold state; test current :		-

								-
	when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current .....:							-
								-
8.2.1.5.3	Limits of operation of instantaneous magnetic overload relays							P
	For all values of the current setting, instantaneous magnetic overload relays shall trip with an accuracy of ± 10% of the value of the published current value corresponding to the current setting							P
	Magnetic settings…….:							P
	Accuracy ± 10% of the value……..:							P
8.2.1.5.4	Limits of operation of automatic change over by under-current relays							P
	- for star-delta starters from star to delta, and - for auto-transformer starters from the starting to the ON position							P
	The lowest drop-out of an under-current relay shall be not greater than 1,5, times the actual current setting of the overload relay which is active in the starting or star connection.							P
	The under-current real shall be able to carry any value of current , from its lowest current setting to stalled current in the starting position or the star connection, for the tripping times determined by the overload relays at its highest current setting							P
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):							P
	- verification by measurement of clearances instead of testing							P
	- rated impulse withstand voltage (V) .....:							—
	- test Uimp main circuits (kV) ..... :							P
	- test Uimp auxiliary circuits (kV) ..... :							P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):							-

	- rated insulation voltage (V) .....:		—
	- main circuits, test voltage for 5 s (V) .....:		P
	- control and auxiliary circuits, test voltage for 5-s (V) ..... :		P
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ...:		P
	Equipment suitable for isolation		P
	The leakage current shall be measured through each pole with the contacts in open position(< 0,5 mA)		P
9.3.1.B	**TEST SEQUENCE II**		**-**
	- verification of read making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		**P**
	Conditions, **make operations** only..... :		P
	Type of product.....:		P
	utilization category ..... :		—
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4		P
	rated operational voltage Ue (V) .....:		—
	rated operational current Ie (A) or power (kW) .....:		—
	- test voltage U/Ue = 1,05 (V) .....:		—
	- test current I/Ie = ____ (A) .....:		—
	- power factor/time constant ..... :		—
	- on-time (ms) .....:		—
	- off-time (s) ..... :		—
	- number of make operations ..... :		P
	Behaviour and condition during and after the test:		P
	- no permanent arcing		P
	- no flash-over between poles		P
	- no blowing of the fusible element in the earth circuit		P
	- no welding of the contacts		P

	- the contacts shall operate when the contactor or starter is switched by the applicable method of control		P
	Conditions, **make/break operations** only.....:		P
	Type of product.....:		P
	utilization category ..... :		-
	rated operational voltage Ue (V) .....:		-
	rated operational current Ie (A) or power (kW) .....:		-
	For starters incorporated two contactors, 2 contactor shall be used with the follow sequence: Close A – open A – close B – open B- off period		-
	- test voltage U/Ue = 1,05 (V) .....:		—
	- test current I/Ie = ____ (A) .....:		—
	- power factor/time constant ..... :		—
	- on-time (ms) .....:		—
	- off-time (s) .....:		—
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		P
	oscillatory frequency (kHz) ..... :		—
	Measured oscillatory frequency (kHz) .....:		P
	Factory ..... :		P
	Behaviour and condition during and after the test:		P
	- no permanent arcing		P
	- no flash-over between poles		P
	- no blowing of the fusible element in the earth circuit		P
	- no welding of the contacts		P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control		P
9.3.3.6	Operational performance capability:		P
	Type of product.....:		P
	utilization category ..... :		—
	rated operational voltage Ue (V) .....:		—
	rated operational current Ie (A) or power (kW) .....:		—
	Conditions, make/break operations:		P
	- test voltage U/Ue = 1,05 (V) .....:		—

	- test current I/Ie = (A) ..... :		—
	- power factor/time constant ..... :		—
	- on-time (ms) .....:		—
	- off-time (s) ..... :		—
	- number of make/break operations ..... :		P
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		P
	oscillatory frequency (kHz) ..... :		—
	Measured oscillatory frequency (kHz) .....:		P
	Factor y ..... :		P
	Behaviour and condition during and after the test:		P
	- no permanent arcing		P
	- no flash-over between poles		P
	- no blowing of the fusible element in the earth circuit		P
	- no welding of the contacts		P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control		P
8.3.3.4	Dielectric verification		P
	test voltage (2 Ui) for 1 min. (V) ..... :		P
	No flashover or breakdown		P
8.3.3.5	Leakage current equipment suitable for isolation		P
	test voltage (1,1 Ue) (V) ..... :		P
	Leakage current: ≤ 2 mA /pole ..... :		P
8.3.4	**TEST SEQUENCE III**		**P**
			P
	- Performance under short-circuit conditions (Clause 9.3.4)		**P**
			P
9.3.4	Performance under short-circuit conditions		P
	Contactors or starter and the associated SCPD, or combination or protected starter are subjected to tests 9.3.4.2.1 and 9.3.4.2.2.		P
	Maximum Ie and of maximum for AC-3 are covered		P
	Rated control supply voltage..... :		P
9.3.4.2.1	Test at de prospective current "r":		P

	Type of product.....:		P
	Test circuit, figure 9, 19, 11, 12.....:		P
	type of SCPD ..... :		—
	ratings of SCPD, co-ordination type 1 .....:		—
	ratings of SCPD, co-ordination type 2 .....:		—
	rated operational current Ie (A) AC-3 ..... :		—
	prospective current "r" (kA) (table 12).....:		—
	test voltage (V) .....:		—
	r.m.s. test current (A) .....:		—
	peak current (A) .....:		—
	power factor		P
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I^2dt (kA^2s) .....:		—
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit .....:		—
	Behaviour of the equipment during the test		P
	Both types of co-ordination (all devices):		P
	A - the fault current has been successfully interrupted by the SCPD or the combination starter and the fuse or fusible element, or solid connection between the enclosure and supply shall not have melted		P
	B - the door or cover of the enclosure has not been blown open and it is possible to open the door or cover		P
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals		P
	D - there is no cracking or breaking of an insulating base to the extent that the integrity of mounting of a live part is impaired		P
	Both types of co-ordination (combination starters and protected starters only):		P
	E - the circuit breaker or the switch is capable of being opened manually by its operating means		P

	F - neither end of the SCPD is completely separated from its mounting means to an exposed conductive part		P
	G - if a circuit breaker with rated ultimate short-circuit breaking capacity less than the rated conditional short-circuit current assigned to the combination or protected starter is employed, the circuit breaker shall be tested to trip:		P
	1) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current		P
	2) circuit breaker with overload relays or releases, at 250% of the rated current of the circuit breaker		P
	Type 1 co-ordination (all devices):		P
	H - there has been no discharge of parts beyond the enclosure. The starter may be inoperative after each operation		P
	Type 1 co-ordination (combination and protected starters only):		P
	I - dielectric verification test voltage (2 Ue) for 1 min (V) but not less than 1000V ..... :		—
	Type 2 co-ordination (all devices):		P
	J - no damage to the overload relay or other parts has occurred, except that welding of contactor or starter contacts is permitted, if they are easily separated without significant deformation		P
	K - the tripping of the overload relay shall be conform to the published tripping characteristics, before and after the test		P
	L - dielectric verification test voltage (2 Ue) for 5 sec but not less than 1000V ..... :		P
	Leakage current equipment suitable for isolation		P
	test voltage (1,1 Ue) (V) ..... :		P
	Leakage current: ≤ 2 mA /pole ..... :		P
8.3.4.2.2	Test at the rated conditional short-circuit current "Iq"		P
	Type of product.....:		P
	Test circuit, figure 9, 19, 11, 12.....:		P
	type of SCPD ..... :		—

	ratings of SCPD, co-ordination type 1 .....:		—
	ratings of SCPD, co-ordination type 2 .....:		—
	rated operational current Ie (A) AC-3 .....:		—
	prospective current "Iq" (kA) .....:		—
	test voltage (V) .....:		—
	r.m.s. test current (A) .....:		—
	peak current (A) .....:		—
	power factor		P
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I^2dt (A^2s) .....:		—
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit .....:		—
	3. one breaking operation of SCPD by closing the switching device on to the short-circuit .....:		—
	Behaviour of the equipment during the test		P
	Both types of co-ordination (all devices):		P
	A - the fault current has been successfully interrupted by the SCPD or the combination starter and the fuse or fusible element, or solid connection between the enclosure and supply shall not have melted		P
	B - the door or cover of the enclosure has not been blown open and it is possible to open the door or cover		P
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals		P
	D - there is no cracking or breaking of an insulating base to the extent that the integrity of mounting of a live part is impaired		P
	Both types of co-ordination (combination starters and protected starters only):		P
	E - the circuit breaker or the switch is capable of being opened manually by its operating means		P

	F - neither end of the SCPD is completely separated from its mounting means to an exposed conductive part		P
	G - if a circuit breaker with rated ultimate short-circuit breaking capacity less than the rated conditional short-circuit current assigned to the combination or protected starter is employed, the circuit breaker shall be tested to trip:		P
	1) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current		P
	2) circuit breaker with overload relays or releases, at 250% of the rated current of the circuit breaker		P
	Type 1 co-ordination (all devices):		P
	H - there has been no discharge of parts beyond the enclosure. The starter may be inoperative after each operation		P
	Type 1 co-ordination (combination and protected starters only):		P
	I - dielectric verification test voltage (2 Ue) for 1 min (V) but not less than 1000V ..... :		—
	Type 2 co-ordination (all devices):		P
	J - no damage to the overload relay or other parts has occurred, except that welding of contactor or starter contacts is permitted, if they are easily separated without significant deformation		P
	K - the tripping of the overload relay shall be conform to the published tripping characteristics, before and after the test		P
	L - dielectric verification test voltage (2 Ue) for 5 s but not less than 1000V ..... :		P
	Leakage current equipment suitable for isolation		-
	test voltage (1,1 Ue) (V) ..... :		-
	Leakage current: ≤ 2 mA /pole ..... :		P

	TEST SEQUENCE IV	**-**

	- Verification of ability to withstand overload currents: Clause 9.3.5 (applicable for contactors only)	**P**

8.3.5	Verification of ability to withstand overload currents		**P**
	Overload current withstand capability of contactors AC-3 and AC-4:		P
	ambient temperature (°C) ..... :		—
	rated operational current Ie (A) max. AC- 3 ..... :		—
	test current (Ie) (A) ..... :		—
	duration of test: 10 s ..... :		—
	After the test, the contactor shall be substantially in the same condition as before the test (visual inspection)		P

	TEST SEQUENCE V	**-**

	- Verification of mechanical properties of terminals: Clause 8.2.4 **- Verification of degrees of protection of enclosed contactors and starters (see annex C of part 1**	**P**

8.2.4	Verification of mechanical properties of terminals		P
		See construction	P
Annex C	Verification of degrees of protection of enclosed contactors and starters		P
		See construction	P

	TEST SEQUENCE Annex B	**-**

	- Mechanical durability B2 **Single 8 test** **Double 3 test** **- Electrical durability B3**	**P**

Annex B2	**Mechanical durability**		-
	Single 8 test		P
	Double 3 test		P
Annex B3	**Electrical durability**		-
			P

	TEST SEQUENCE Annex F	**-**

	Requirements for auxiliary contact linked with power contact (mirror contact)		**-**
			-

	TEST SEQUENCE EMC tests	**P**

	Immunity		P
	Emission		P

- End of Test Report -

Type of equipment: AC Contactor
model: CJX2-D0910

Details of:

View:

[X] general

[ ] front

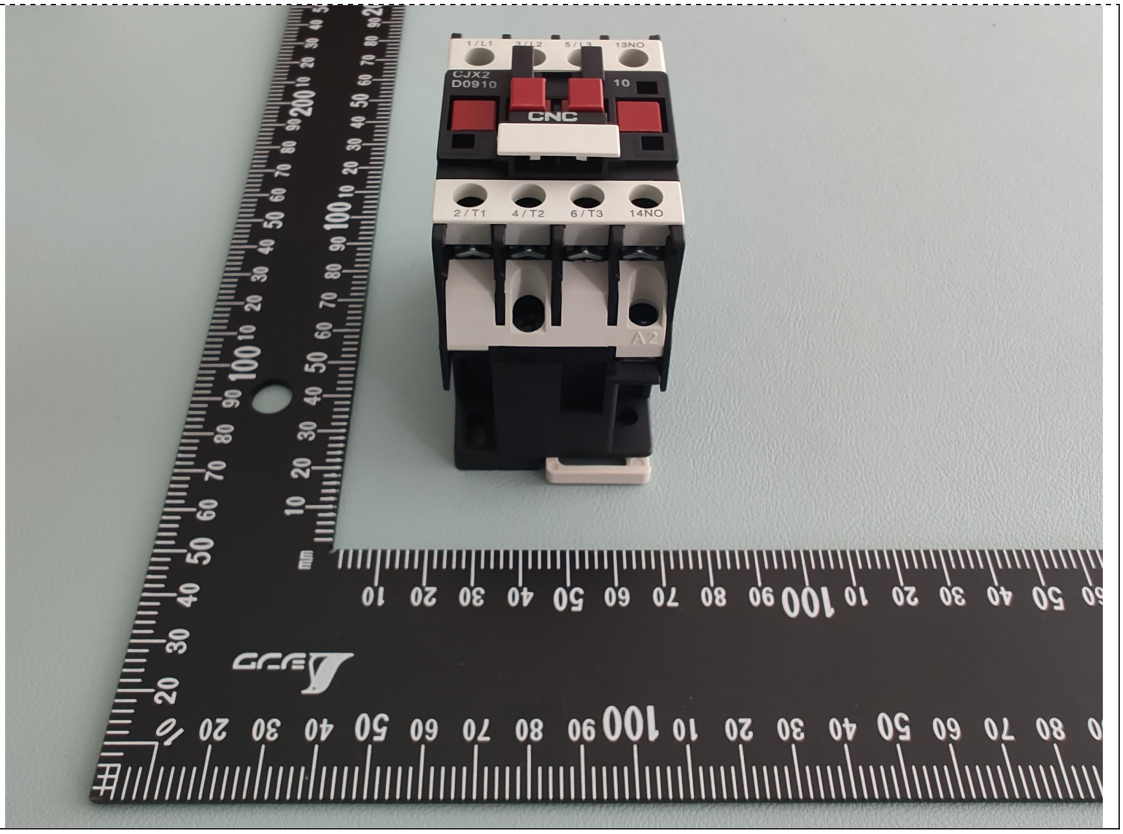
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of:

View:

[X] general

[ ] front

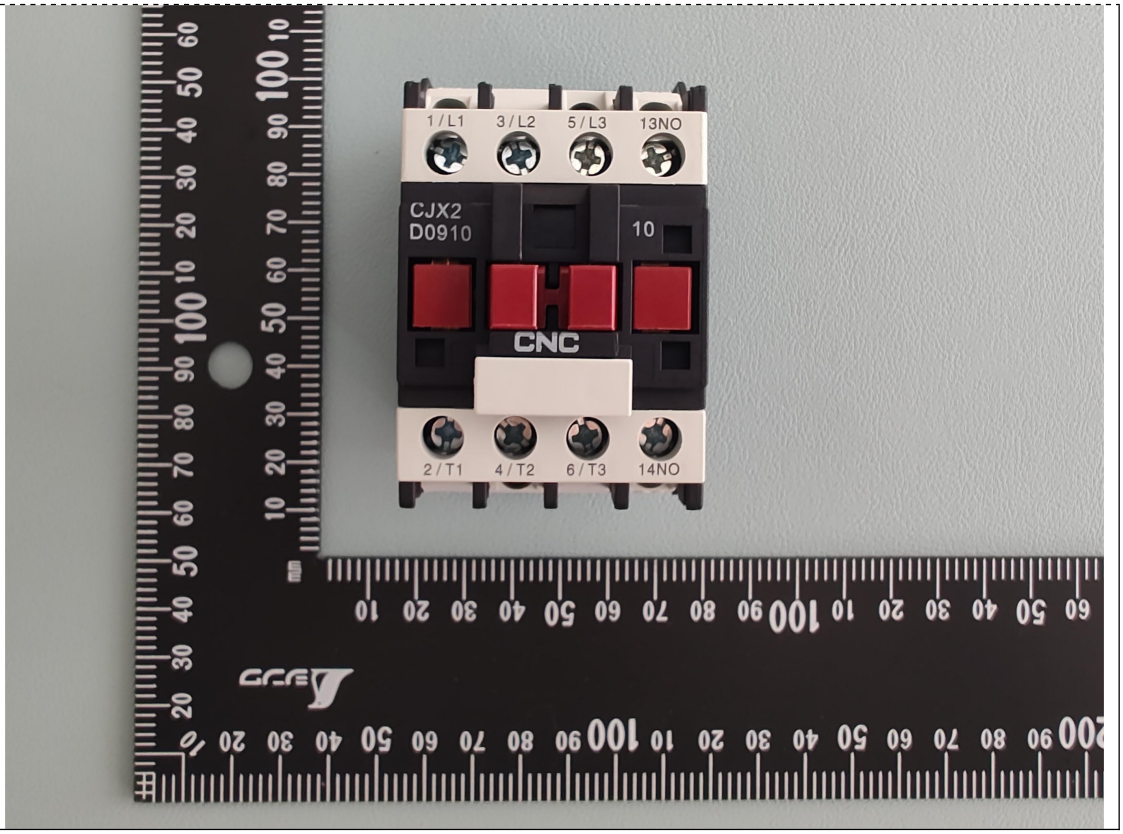
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of:

View:

[X] general

[ ] front

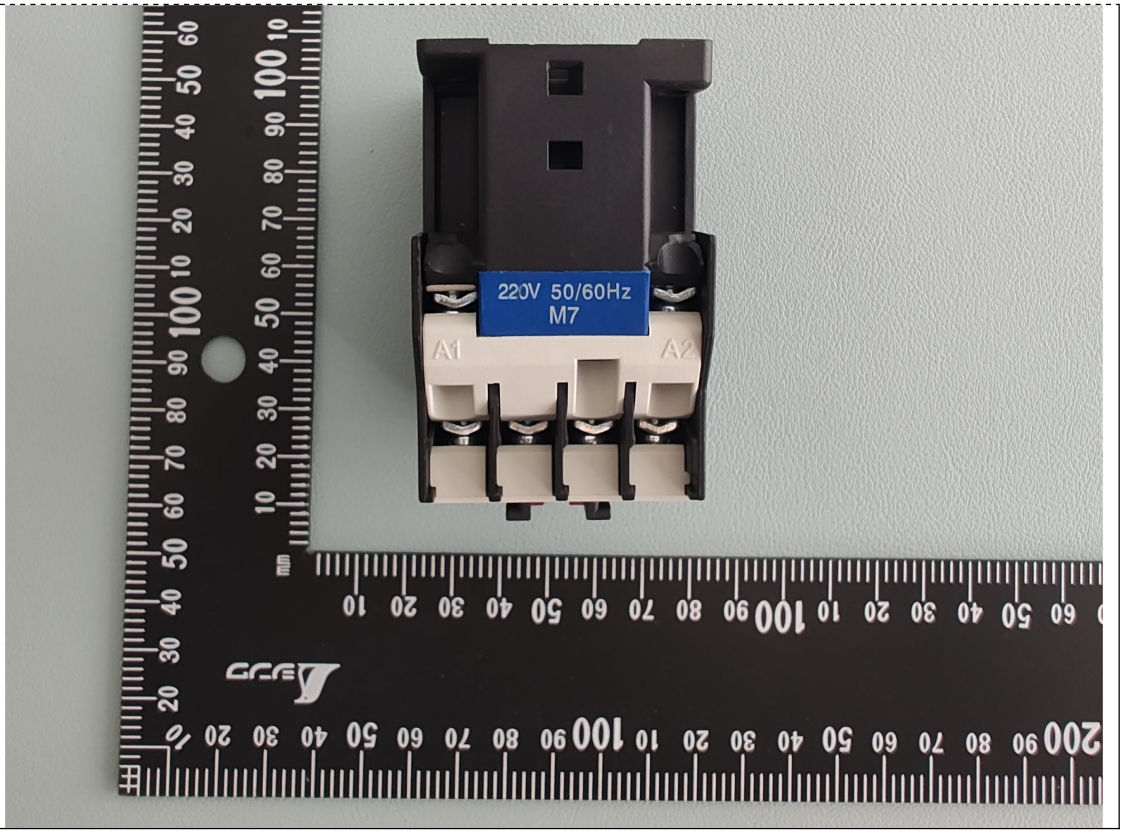
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of:

View:

[X] general

[ ] front

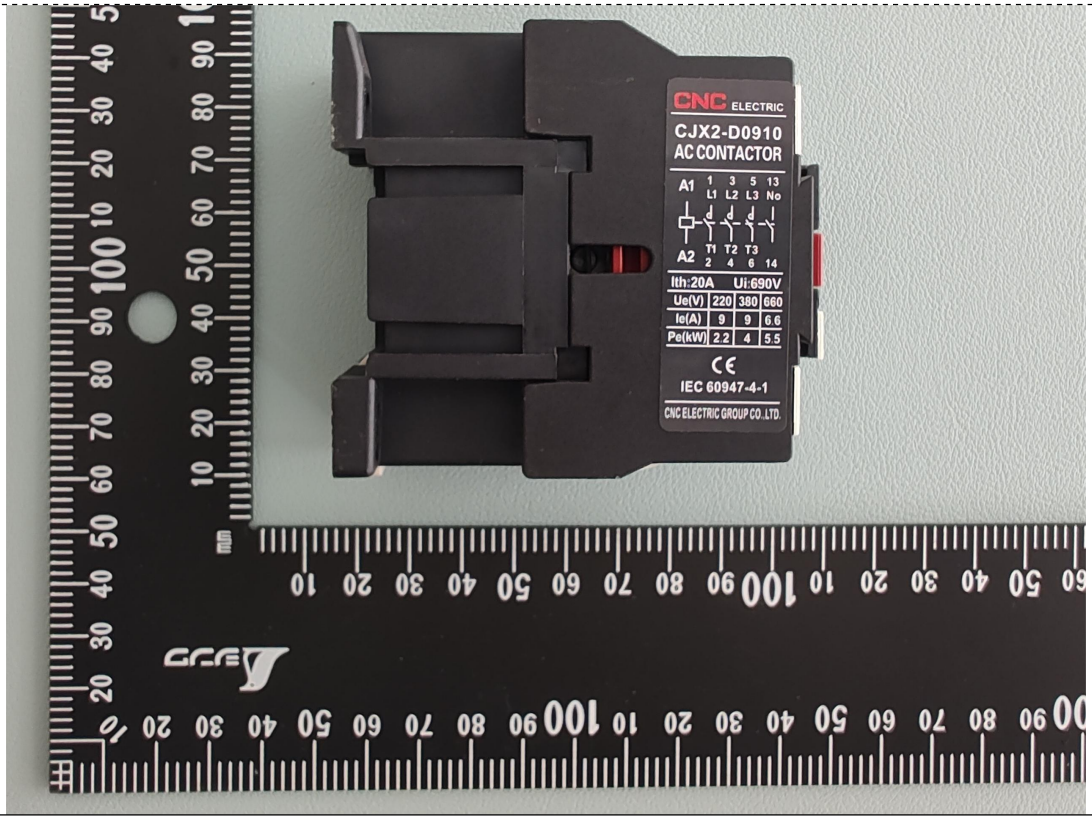
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



- End of Photo Documentation-