DECLARACIÓN JURADA DE CONFORMIDAD (DJC)

(Según Resolución S.I.C. N° 236/2024 (Materiales para instalaciones eléctricas) y complementarias)

a. Número de identificación único de declaración de conformidad: 00009

b. Información del signatario:

i. Razón Social:	Provar Consorcio de Cooperación Empresaria
ii. C.U.I.T:	30-71023845-2
ii. Nombre comercial o Marca registrada:	Provar Consorcio de Cooperación Empresaria
iv. Domicilio Legal:	Hipólito Yrigoyen 4268, San Martín, Buenos Aires, 1650, Argentina
v. Domicilio de depósito del importador:	Ruta Prov. N°24 Entre Teresa de Calcuta y Corrientes, (Polo industrial - Gral. Rodriguez)
vi. Teléfono:	116801-0737
vii. Correo electrónico:	admin@neored.com.ar

Representante Autorizado (Si fuera aplicable):

viii. Nombre y apellido / razón social:	No aplicable
ix. C.U.I.T.	No aplicable
x. Domicilio legal:	No aplicable

c. Información del producto:

i. Código de identificación único del producto (Autodeterminado)	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65
ii. Fabricante (Nombre y dirección de la planta de producción);	Zhejiang Changcheng Trading Co.,Ltd. / Fábrica: CNC Electric Group Co., Ltd. No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province - CHINA
iii. Identificación del producto:	Contactor / AC Contactor
marca:	CNC
modelo:	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65
características técnicas:	Ver anexo del certificado Nro FR_721419

d. Normas y evaluación de la conformidad:

i. Reglamento/s por el que se encuentra alcanzado	Resolución S.I.C. N° 236/2024 (Materiales para instalaciones eléctricas)	
ii. Norma/s Técnica:	IEC 60947-1:2020, IEC 60947-4-1:2023, IEC 60947-5-1:2024	
iii. Referencia al documento de evaluación de conformidad emitido por Organismo de Certificación:	Nro. de certificado:	FR_721419
	Esquema: (ISO/IEC 17067)	2
	Fecha de emisión:	17/04/2025

	Fecha de última vigilancia:	No aplicable
	Fecha de próxima vigilancia:	17/04/2027
	Organismo de Certificación:	LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES – LCIE, organismo perteneciente al CB Scheme.
	Contacto:	contact@lcie.fr

e. Otros datos.

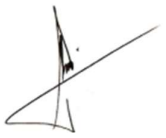
i. Enlace a la copia de la declaración de conformidad en Internet	N/A

f. Responsabilidad y Sanciones

La presente **Declaración Jurada de la Conformidad (DJC)** se emite en total conformidad con el **Reglamento Técnico** aprobado por Resolución S.I.C. N° 236/2024 (Materiales para instalaciones eléctricas) de la **SECRETARÍA DE INDUSTRIA Y COMERCIO**, asumiendo la responsabilidad directa por los datos declarados, por la conformidad del producto y por la conservación de la DJC, así como la totalidad de la documentación respaldatoria de los datos aquí denunciados, durante diez años después de la introducción del producto en el mercado de la República Argentina.

La inexactitud, falsedad u omisión de carácter esencial de cualquier dato o información en esta Declaración, o la falta de presentación de la documentación requerida por la Autoridad, será pasible de las sanciones previstas en la **Ley N° 24.240** y sus modificatorias, así como en el **Decreto N° 274/2019**, sin perjuicio de la responsabilidad penal, civil o administrativa aplicable, conforme al **Artículo 110 del Reglamento de Procedimientos Administrativos, Decreto N° 1.759/72 – T.O. 2017**.

Fecha de emisión de esta declaración:	3 de julio de 2025
Lugar:	Buenos Aires, Argentina



_____

Firma del responsable

Gabriel Tiburtini
Apoderado

Provar Consorcio de Cooperación Empresaria

Ref. Certif. No.

FR_721419

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	**Contactor** AC Contactor
Name and address of the applicant	**Zhejiang Changcheng Trading Co.,Ltd.** No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province - CHINA
Name and address of the manufacturer	**CNC Electric Group Co., Ltd.** No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province - CHINA
Name and address of the factory	**CNC Electric Group Co., Ltd.** No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province - CHINA
Note: *When more than one factory, please report on page 2*	☐ Additional Information on page 2
Ratings and principal characteristics	See Annex
Trademark / Brand (if any)	CNC
Customer's Testing Facility (CTF) Stage used	/
Model / Type Ref.	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65
Additional information (if necessary may also be reported on page 2)	☐ Additional Information on page 2
A sample of the product was tested and found to be in conformity with	IEC 60947-1:2020 IEC 60947-4-1:2023 IEC 60947-5-1:2024
As shown in the Test Report Ref. No. which forms part of this Certificate	B240164-01, B240164-02

This CB Test Certificate is issued by the National Certification Body

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES - LCIE
33 avenue du Général Leclerc
92260 Fontenay-aux-Roses, FRANCE
www.lcie.fr

Date: 17/04/2025

Signature: Julien GAUTHIER
Certification Officer

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
S.A.S au capital de 15.745.984 €
RCS Nanterre B 408 363 174

ANNEX

Rated operational voltage Ue (V):	220/230/380/400/660/690V~
Rated insulation voltage Ui (V):	690V
Rated impulse withstand voltage Uimp (kV):	6kV
Conventional free air thermal current Ith (A):	50A(CJX2i-40 / CJX2s-40); 60A(CJX2i-50 / CJX2s-50); 80A(CJX2i-65 / CJX2s-65)
Utilization category:	AC-3, AC-4
Ue/Ie at each utilization category:	CJX2i-40, CJX2s-40: 34A (AC-3, 660/690V~); 40A (AC-3, 220/230/380/400V~); 9A (AC-4, 660/690V~); 18,5A (AC-4, 220/230/380/400V~).
	CJX2i-50, CJX2s-50: 39A (AC-3, 660/690V~); 50A (AC-3, 220/230/380/400V~); 12A (AC-4, 660/690V~); 24A (AC-4, 220/230/380/400V~).
	CJX2i-65, CJX2s-65: 42A (AC-3, 660/690V~); 65A (AC-3, 220/230/380/400V~); 14A (AC-4, 660/690V~); 28A (AC-4, 220/230/380/400V~).
Rated control circuit supply voltage Us(a.c. / d.c.):	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz
Rated prospective short-circuit current "r" (kA) :	5kA
Rated conditional short-circuit current Iq (kA):	5kA
Type of co-ordination:	Type 2
Type of SCPD:	Fuse RT16 gG 80 A
Number of poles:	3P
Auxiliary circuits:	1 NO and 1 NC Ith: 10A AC-15: 380V~, 0,95A; 220V~ 1,6A; 50/60Hz DC-13: 220V DC, 0,15A

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES - LCIE
33 avenue du Général Leclerc
92260 Fontenay-aux-Roses, FRANCE
www.lcie.fr

Date: 17/04/2025

Signature: Julien GAUTHIER
Certification Officer

Test Report issued under the responsibility of:

TEST REPORT
IEC 60947-4-1
Low voltage switchgear and controlgear
Part 4: Contactors and motor-starters
Section 1 - Electromechanical contactors and motor-starters

Report Number. .....:	**B240164-01**
Date of issue .....:	**2025-04-01**
Total number of pages.....:	**104 pages**
Name of Testing Laboratory preparing the Report.....:	**Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)**
Applicant's name.....:	**Zhejiang Changcheng Trading Co.,Ltd.**
Address .....:	**No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province, China**
Test specification:	
Standard.....:	IEC 60947-4-1:2023 to be used in conjunction with IEC 60947-1:2020.
Test procedure .....:	CB Scheme
Non-standard test method .....:	N/A
TRF template used .....:	IECEE OD-2020-F1:2023, Ed.1.6
Test Report Form No.....:	IEC60947_4_1E
Test Report Form(s) Originator ....:	DEKRA Certification B.V.
Master TRF.....:	Dated 2024-03-15

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	AC Contactor
Trade Mark ..... :	CNC
Manufacturer ..... :	CNC Electric Group Co., Ltd. No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province, China
Model/Type reference ..... :	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65
Ratings ..... :	See pages 9 to 15

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)	
Testing location/ address.....:		Inspection and Quarantine Mansion, jingang Avenue, Liushi, Yueqing, Wenzhou, Zhejiang, P.R.China	
Tested by (name, function, signature).....:		Gaoke Zheng - Testing engineer Lechen HU - Testing engineer (Reviewer)	Gaoke Zheng Lechen Hu
Approved by (name, function, signature)...:		Xiaomu Ye - Technical manager	Xiaomu Ye
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment): N/A

Summary of testing:

Standard used:

-IEC 60947-1:2020

-IEC 60947-4-1:2023

-IEC 60947-5-1:2024

-EN 60947-1:2007 + A1:2011 + A2:2014

-EN IEC 60947-4-1:2019

-EN 60947-5-1:2017

-This CB test report consists of 2 reports B240164-01 and B240164-02.

-All the samples are satisfied to the clauses examined.

-2 products of model CJX2i and CJX2s with 2 different colours of enclosures are applied.

-The 2 enclosures have the same structure and are made of the same material, only the colours are different. So, the type tests are performed on products of model CJX2i.

-The products have two groups of auxiliary contacts, 1 for NO and 1 for NC, the position of the auxiliary contact is marked on the plate NO or NC (See marking plate page 6 to 8).

-The auxiliary contacts are tested according to the standard IEC/EN 60947-5-1(See test report B240164-02).

-The product CJX2i-40, CJX2i-50, CJX2i-65 have the same function design and internal structure, only the marking plate are different.

Tests performed (name of test and test clause):

IEC 60947-4-1 (See report B240164-01)

Type reference	Utilization category	Ue	Us	Tests sequence				
				1	2	3	4	5
CJX2i-65	AC-3	660/690V~	440V~	1	1	1	1	1
	AC-4	660/690V~	440V~	-	1	-	-	-
	AC-3	220/230/380/400V~	440V~	-	1	-	-	-
	AC-4	220/230/380/400V~	440V~	-	1	-	-	-
	AC-3	660/690V~	415V~	1*	-	-	-	-
	AC-3	660/690V~	380/400V~	1*	-	-	-	-
	AC-3	660/690V~	240V~	1*	-	-	-	-
	AC-3	660/690V~	220/230V~	1*	-	-	-	-
	AC-3	660/690V~	127V~	1*	-	-	-	-
	AC-3	660/690V~	110V~	1*	-	-	-	-
	AC-3	660/690V~	48V~	1*	-	-	-	-
	AC-3	660/690V~	36V~	1*	-	-	-	-
	AC-3	660/690V~	24V~	1*	-	-	-	-

*Only clause 9.3.3.2.1

IEC 60947-5-1 (See report B240164-02)

Type reference	Number of auxiliary contacts	Number of NC auxiliary contacts	Number of NO auxiliary contacts	Ue	Us	Tests sequence					
						I	II	III	IV	V	VI
CJX2i-65	2	1	1	380V~	440V~	1	-	-	1	1	1
				380V~	415V~	-	1	-	-	-	-
				220V~	380/400V~	-	1	-	-	-	-
				220V DC	240V~	-	1	-	-	-	-
				380V~	220/230V~	-	-	1	-	-	-
				220V~	127V~	-	-	1	-	-	-
				220V DC	110V~	-	-	1	-	-	-

Testing location:

Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)

Address: Inspection and Quarantine Mansion, jingang Avenue, Liushi, Yueqing, Wenzhou, Zhejiang, P.R.China

Summary of compliance with National Differences

- IECEE Member countries that are also CENELEC members
  Compliance with Group Differences evaluated ☐ **yes** ☐ **No** ☒ N/A

- IECEE Member countries with published National Differences which were evaluated:
  N/A

- IECEE Member countries that did not publish any National Differences:
  N/A

To support compliance with published National Differences, attach a compilation of relevant ND and/or GD TRFs to the CB Test Report

Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other: … (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

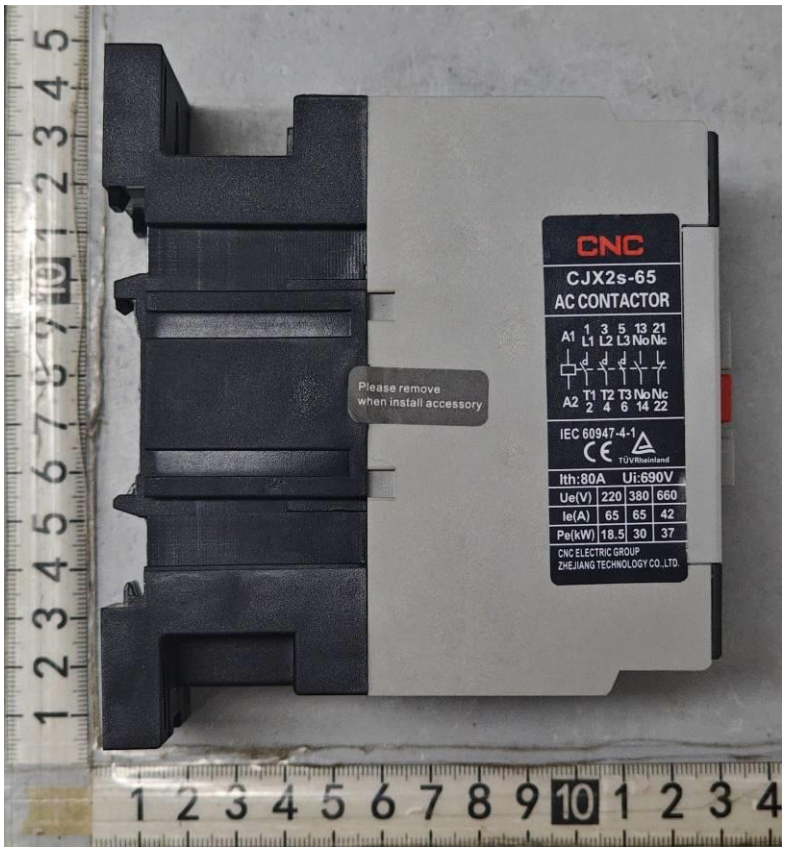
Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

CJX2i-65

Copy of marking plate:

CJX2s-65



Test item particulars.....:	Contactor
Classification of installation and use.....:	On rail
Supply Connection.....:	Terminals for copper conductors
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2024-12
Date (s) of performance of tests.....:	2024-12-31 to 2025-02-27

General remarks:

"(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.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	CNC Electric Group Co., Ltd. No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province, China

General product information and other remarks:

Main circuit:

3P

Ue: 220/230/380/400/660/690V~; 50/60Hz

Us: 440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz

Utilization category	Ue	Ie		
		CJX2i-40 / CJX2s-40	CJX2i-50 / CJX2s-50	CJX2i-65 / CJX2s-65
AC-3	660/690V~	34A	39A	42A
	220/230/380/400V~	40A	50A	65A
AC-4	660/690V~	9A	12A	14A
	220/230/380/400V~	18,5A	24A	28A

Ith: 50A(CJX2i-40 / CJX2s-40); 60A(CJX2i-50 / CJX2s-50); 80A(CJX2i-65 / CJX2s-65)

Ui= 690V Uimp=6kV

Pollution degree: 3

-Nominal diameter of thread for Main circuits terminals: M8 Tightening torque: 6 Nm

Minimum cross section(mm^2) / Number of conductors / Rigid –flexible: 2,5 mm^2 / 2 / Rigid and flexible

Maximum cross section(mm^2) / Number of conductors / Rigid –flexible: 25 mm^2 / 1 / Rigid and flexible

Distance for metal screen: Back:0mm Front:0mm; Top:45mm Botton:45mm; Left:0mm Right:0mm

Auxiliary circuit:

Utilization category	Ue	Ie
AC-15	380V~ 50/60Hz	0,95A
AC-15	220V~ 50/60Hz	1,6A
DC-13	220V DC	0,15A

Ith=10A

Ui: 400V Uimp=4kV

Pollution degree: 3

-Nominal diameter of thread for Auxiliary circuits terminals: M3.5 Tightening torque: 0,8 Nm

Minimum cross section(mm^2) / Number of conductors / Rigid –flexible: 0,5 mm^2 / 2 / Rigid and flexible

Maximum cross section(mm^2) / Number of conductors / Rigid –flexible: 1,5 mm^2 / 2 / Rigid and flexible

Distance for metal screen: Back:0mm Front:0mm; Top:45mm Botton:45mm; Left:0mm Right:0mm

Control circuit:

-Nominal diameter of thread for Auxiliary circuits terminals: M3.5 Tightening torque: 0,8 Nm

Minimum cross section(mm^2) / Number of conductors / Rigid –flexible: 0,5 mm^2 / 2 / Rigid and flexible

Maximum cross section(mm^2) / Number of conductors / Rigid –flexible: 1,5 mm^2 / 2 / Rigid and flexible

Distance for metal screen: Back:0mm Front:0mm; Top:45mm Botton:45mm; Left:0mm Right:0mm

- kind of equipment	Contactor
- number of poles	3
- kind of current (AC or DC)	AC
- interrupting medium	Air
- method of operation	Electromagnetic
- method of control	Automatic
- method of change-over for particular types of starters	N/A
- method of connecting for particular types of starters	N/A
- motor overload detection	N/A
- motor switching	N/A
- rated frequency	50/60Hz
- rated duties	Uninterrupted duties
- Utilization category	AC-3 and AC-4
Rated and limiting values, main circuit	
Rated voltages	
- rated operational voltage U_e (V)	220/230/380/400/660/690V~
- rated stator operational voltage U_{es} (V)	N/A
- rated rotor operational voltage U_{er} (V)	N/A
- rated insulation voltage U_i (V)	690V
- rated stator insulation voltage U_{is} (V)	N/A
- rated rotor insulation voltage U_{ir} (V)	N/A
- rated impulse withstand voltage U_{imp} (kV)	6kV
- rated starting voltage of an auto-transformer starter	N/A
Currents or powers	
- conventional free air thermal current I_{th} (A)	See page 9
- conventional enclosed thermal current I_{the} (A)	N/A
- conventional stator thermal current I_{ths} (A)	N/A
- conventional rotor thermal current I_{thr} (A)	N/A
- rated operational current I_e (A) or rated operational powers	See page 9
- rated stator operational current I_{es} (A) or rated stator operational powers	N/A
- rated rotor operational current I_{er} (A)	N/A
- rated uninterrupted current I_u (A)	Equal to Ie

-rated duty.....:	Uninterrupted duties
Normal load and overload characteristics	
- ability to withstand motor switching overload currents.....:	8 X Ie
-rated making capacity .....:	10 X Ie for AC-3; 12 X Ie for AC-4
-rated breaking capacity.....:	8 X Ie for AC-3; 10 X Ie for AC-4
-conventional operational performance .....:	2 X Ie for AC-3; 6 X Ie for AC-4
Starting and stopping characteristics of starters	
-service conditions for starters .....:	N/A
Short-circuit characteristics	
- rated ultimate short-circuit breaking capacity of a MPSD I_{cu} (kA).....:	N/A
- rated service short-circuit breaking capacity of a MPSD I_{cs} (kA) .....:	N/A
- rated prospective short-circuit current "r" (kA) .....:	5kA
- rated conditional short-circuit current Iq (kA).....:	Ir=Iq
- type of co-ordination.....:	2
- Pole impedance of a contactor (Z) .....:	1,0mΩ±0,5mΩ
Control circuits	
Characteristics of electrical and electronic control circuits	
- type of current.....:	AC
- rated frequency or d.c. .....:	50/60Hz
- rated control circuit voltage Uc (a.c. / d.c.) .....:	N/A
- rated control circuit supply voltage Us (a.c. / d.c.) .....:	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz
- nature of external control circuit devices (contacts, sensors, optocouplers, electronic active components, etc):	N/A
- power consumption .....:	N/A
- limited energy (if the source is in accordance with 8.1.14):	N/A
- SELV (PELV) supply .....:	N/A
- holding power .....:	24VA±30%(50Hz); 22VA±30%(60Hz)
- pick-up power .....:	220VA±30%(50Hz); 220VA±30%(60Hz)
Rated and limiting values of air supply control circuit	
- rated pressure and limits.....:	N/A
- volumes of air .....:	N/A

Auxiliary circuits:	
- rated operational voltage Ue (V) ..... :	380V~, 220V~, 220V DC
- rated insulation voltage: Ui (V) ..... :	400V~
- rated operational current: Ie (A) ..... :	0,95A at 380V~
	1,6A at 220V~
	0,15A at 220V DC
- kind of current ..... :	AC / DC
- rated frequency: (Hz) ..... :	50/60Hz
- number of circuits ..... :	2
- number and kind of contact elements ..... :	1 NO and 1 NC
- rated uninterrupted current: Iu (A) ..... :	Equal to Ie
- utilization category: (AC, DC, current and voltage) ..... :	AC-15 / DC-13
Short-circuit characteristic	
- Rated conditional short-circuit current (kA) ..... :	1kA
- kind of protective device ..... :	Fuse: RT18-32A; gG; 10A

Rated and limiting values of relays and releases	
- types of relay or release.....:	☐ a) release with shunt coil (shunt trip) ☐ b) under voltage and under–current opening relay or release ☐ c) overload time-delay relay the time-lag of which is: ☐ 1) substantially independent of previous load (e.g. time-delay magnetic overload relay) ☐ 2) dependent on previous load (e.g. thermal or electronic overload relay) ☐ 3) dependent on previous load (e.g. thermal or electronic overload relay) and also sensitive to phase loss ☐ d) instantaneous overload relay or release ☐ e) instantaneous short-circuit relays or releases. ☐ f) Stall relay or release ☐ g) other relays or releases (e.g., control relay associated with devices for the thermal protection of the motor
characteristic values	
a) release with shunt coil, under–voltage (under–current) opening relay or release	
- rated voltage (current) .....:	N/A
- rated frequency.....:	N/A
- operating voltage (current) .....:	N/A
- operating time.....:	N/A
- inhibit time.....:	N/A
b) Overload relay and release (including the overload function of MPSD)	
-designation and current settings.....:	N/A
-rated frequency, when necessary (for example in case of a current transformer operated overload relay) .....:	N/A
- time-current characteristics (or range of characteristics), when necessary.....:	N/A
- trip class according to classification in table 2, or the value of maximum tripping time, in seconds, under the conditions specified in 8.2.1.5.1, table 3, column D, when this time exceeds 40 s. .....:	N/A
- number of poles.....:	N/A
- nature of the relay: thermal, magnetic, electronic without thermal memory.....:	N/A
- nature of the reset .....:	N/A
- tripping time of overload relays class 10A if longer than 2 min at –5 °C or below .....:	N/A

c) Release with residual current sensing relay	
- rated current .....:	N/A
- operating current .....:	N/A
- operating time or time-current characteristic according to table T.1 of IEC 60947-1:2020…….:	N/A
- inhibit time (when applicable) .....:	N/A
- type designation (see Annex T of IEC 60947-1:2020) .....:	N/A
d) Short-circuit release of a MPSD:	
- rated operational currents (I_e) or rated operational powers	N/A
- rated frequency …….:	N/A
- current setting (or range of settings) if applicable .....:	
Type and characteristics of automatic change-over devices and automatic acceleration control devices	
Types	☐ a) time delay, e.g. time delay contactor relays (see IEC 60947-5-1) applicable to control-devices or specified-time-or nothing relays (see IEC 61810-1) ☐ b) under current devices (undercurrent relays ☐ c) other devices for automatic control - ☐ devices dependent on voltage - ☐ devices on power - ☐ devices depending on speed
Characteristics	
a) the characteristics of time-delay devices are	
- the rated time-delay or its range, if adjustable .....:	N/A
- for time-delay devices fitted with a coil, the rated voltage, when it differs from the starter line voltage.....:	N/A
b) the characteristics of the under voltage devices are	
- the rated current (thermal current and /or rated short-circuit withstand current, according to the indications given by the manufacturer) .....:	N/A
- the current setting or its range, if adjustable .....:	N/A
c) the characteristics of the other devices shall be determined by agreement between manufacturer and user	

Types and characteristics of auto-transformers for two-step auto-transformer starter

Account being taken of the starting characteristics (see 5.3.5.5.3), starting auto-transformers shall be characterized by

- rated voltage of auto-transformer ..... : N/A
- the number of taps available for adjusting torque and current ..... : N/A
- the starting voltage, i.e. the voltage at the tapping terminals, as a percentage of the rated voltage of auto-transformer ..... : N/A
- the current they can carry for a specified duration ..... : N/A
- the rated duty(see 5.3.4) ..... : N/A
- the method of cooling ..... : ☐ air-cooling ☐ oil-cooling
- mounting design ..... : ☐ built-in ☐ or provide separately

Types and characteristics of starting resistors for rheostatic starters

Account being taken of the starting characteristics (see 5.3.5.5.1), the starting resistor shall be characterized by: N/A

- the rated rotor insulation voltage (Uir) ..... : N/A
- their resistor value ..... : N/A
- the mean thermal current, defined by the value of steady current they can carry for specified duration ..... : N/A
- the rated duty (see 5.3.4) ..... : N/A
- the method of cooling ..... : ☐ free air ☐ forced air ☐ foil immersion
- mounting design ..... : ☐ built-in ☐ or provide separately

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Clause	Requirement + Test	Result - Remark	Verdict

6.2	**MARKING**		
	Data shall be marked on the equipment (mandatory):		
	a – manufacturer's name or trade mark (6.1.1)		P
	b – type designation or serial number (6.1.1)	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65	P
	Data shall be marked on the equipment:		
	c - number of the standard (6.1.1)	IEC/EN 60947-4-1	P
	b - polarity of terminals, if applicable (6.1.2)		N/A
	h - IP code (6.1.2)		N/A
	s – (Overload) relays and releases: Characteristic values, designation and current settings (6.1.2)		N/A
	Data (6.1.2) shall be included on the nameplate, or on the equipment, or in the product documentation:		
	a - rated operational voltages (6.1.2)	220/230/380/400/660/690V~	P
	c - utilization category and rated operational currents (or rated powers), at the rated operational voltages of the equipment	AC-3 and AC-4	P
	d - either the value of the rated frequency/ies, or the indication d.c. (or symbol) .....:	50/60Hz	P
	e – pole impedance of the switching device (*Z*);	1,0mΩ±0,5mΩ	P
	f – environmental information		N/A
	Safety and installation:		
	g – rated insulation voltage – rated impulse withstand voltage	690V	P
	i - pollution degree	III	P

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Clause	Requirement + Test	Result - Remark	Verdict
	j – short circuit rating: - rated conditional short-circuit current (see 5.3.6) and type of co-ordination of the contactor or starter (see 8.2.5.1) and the type, current rating and characteristics of the associated SCPD; - rated conditional short-circuit current (see 5.3.6) of the combination starter, the combination switching device, the protected starter or the protected switching device and type of co-ordination (see 8.2.5.1) - for MPSD, rated ultimate short-circuit breaking capacity (I_{cu}) and rated service short circuit breaking capacity (I_{cs}) (see 8.2.4.7).		N/A
	k - maximum permissible altitude of the site of installation, if greater than 2 000 m.	p-≤2000m altitude, if the altitude greater than 2000m, this item subject to agreement between manufacturer and user	P
	l – conductor connection terminal - length of insulation to be removed before insertion of the conductor into the terminal; - maximum number of conductors which may be clamped. for non-universal screwless terminals: - “s” or "sol" for terminals declared for rigid-solid conductors; - "r" for terminals declared for rigid (solid and stranded) conductors; - “f” for terminals declared for flexible conductors.	-15mm of insulation to be removed before -For Main circuits terminals: Max.Rigid –flexible:25mm^2 /1 Min.Rigid –flexible:2,5mm^2 /2 -For Auxiliary circuits terminals: Max.Rigid –flexible:1,5mm^2/2 Min.Rigid –flexible:0,5mm^2/2 -For Control circuits terminals: Max.Rigid –flexible:1,5mm^2/2 Min.Rigid –flexible:0,5mm^2/2	P
	m - reference of the different parts of the starter to be associated including the dedicated wiring accessories which can be used for wiring the starter or the combination of contactors;		N/A
	Control circuits		

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Clause	Requirement + Test	Result - Remark	Verdict
	The following information concerning control circuits shall be placed either on the coil or on the equipment:		
	n – rated control circuit voltage (Uc), nature of current and rated frequency	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz	P
	o - if declared, the power consumption of the control circuit such as holding power, pickup power according to 8.2.4.5.		N/A
	Air supply systems for starter or contactors operated by compressed air		
	p - rated supply pressure of the compressed air and limits of variation of this pressure, if they are different from those specified in 8.2.1.2		N/A
	Auxiliary circuits:		
	q – ratings of auxiliary circuits		P
	Overcurrent relays and releases:		
	r – types of relays and releases, time current characteristics and influence of ambient air temperature		N/A
	Additional information for certain types of contactor and starter:		
	Rheostatic starters:		
	t – circuit diagram and - severity of start, see 5.3.5.5.2 - starting time, see 5.3.5.5.2		N/A
	Auto-transformer starters:		
	u – rated starting voltage(s), i.e. voltage(s) at the tapping terminals		N/A
	EMC		
	v – information about the applicable electromagnetic environment equipment and class A or B of CISPR 11 and special requirements, if applicable, for example shielded or twisted conductors	☐ E-II ☐ E-III ☐ E-IV	N/A
	Suitability for use downstream of a BDM		

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Clause	Requirement + Test	Result - Remark	Verdict
	w - the type and designation of the associated basic drive module (BDM), on the load side of the BDM, compliant with IEC 61800-5-1 with the appropriate setting limits and the maximum wiring length to the starter or • the maximum rated voltage, • the maximum recurring peak voltage, • the maximum pulse frequency, and • the rated voltage pulse slope, obtained in the condition of 9.3.3.3.10;		N/A
	MPSD shall be marked in addition, in a place such that they are visible and legible when the MPSD is installed, for the: - suitability for isolation, if applicable. - indication of the open and closed positions		N/A
	The following data shall be marked externally on the MPSD in a place such they may be visible and legible when the MPSD is installed: – range of the rated instantaneous short-circuit current setting (I_i), for adjustable releases.		N/A
	For dedicated accessories used for wiring the starter or the combination of contactors, data under 6.1.1 c), 6.1.2 g) and the current I_{th}, if applicable, shall be provided in the product documentation.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

6.3	**Instruction for installation, operation and maintenance, decommissioning and dismantling**		
	The manufacturer shall specify in his documents or catalogues the conditions for installation, operation and maintenance, if any, of the equipment during operation and after a fault. The manufacturer shall also specify the measures to be taken with regard to EMC, if any.		P
	For equipment only suitable in environment A (see 8.3.1) the manufacturer shall provide the following notice to potential customers, and with the product for users:	NOTICE: This product has been designed for environment A. Use of this product in environment B may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures.	N/A
	If necessary, the instructions for the transport, installation and operation of the equipment shall indicate the measures that are of particular importance for the proper and correct installation, commissioning and operation of the equipment.		P
	Additional information for the decommissioning and dismantling of the equipment shall be made available to the user in case of foreseeable hazardous condition of the device, for example due to stored energy, instability or falling of objects, etc.		N/A
	These documents shall indicate the recommended extent and frequency of maintenance, if any.		P
	For each relevant potential hazard, the manufacturer shall provide safety signs, graphical symbols or safety notes of the hazard, for example by using IEC 60417-5036 (2002-10). Signal words shall be defined according to ISO 3864-2.		P
	Subclause 6.3 of IEC 60947-1:2020 applies with the following addition.		
	The instructions shall also cover the dedicated wiring accessories.		P
	In case of protected starters, the manufacturer shall also provide the necessary mounting and wiring instruction		N/A
	The manufacturer of a starter incorporating an automatic reset overload relay capable of being connected to enable automatic restarting, shall provide, with the starter, that information necessary to alert the user to the possibility of automatic restarting.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	In case of a separately mounted overload relay, instruction shall provide: – The determination method of the short-circuit protection of the complete starter: Selection f the smallest SCPD according to the lowest I_q of its components. Only components with the same kind of SCPD can be co-ordinated. – The cable cross-sections of the power circuit; – The maximum crossover current I_{cd} according to B.4.5. – The maximum rated values of the control circuit of the contactor to be associated according to 6.1.2 n)		N/A
	When the contactor or starter is declared as suitable for use downstream to basic drive module, appropriate instruction shall be provided for assessing the use conditions according to the conditions given in 6.1.2 w) and for verifying the length of connection to the motor is below the limit given in the instruction manual of the BDM in order to limit the reflected wave phenomena.		N/A
	For enclosed combination starters provided with a defeating mechanism of the door or cover interlocking as described in 8.1.11.1, the instruction shall include information about the associated defeating method.		N/A
	If the construction requires energization by an external source that is not a limited energy source as defined in 8.1.14, the manufacturer shall provide the appropriate information for short-circuit and overcurrent protection of the ports.		N/A
	Hazardous substances used intentionally in the equipment shall be declared in the equipment documentation. See also 8.1.1.		N/A
6.4	**Environmental information**		
	When declared, the material declarations shall be provided according to IEC TS 63058		P
	Hazardous substances used by design in the equipment shall be declared in the product documentation.		P
6.5	**Instruction for equipment capable to be reused, repaired and upgraded**		
	Equipment declared as capable of being reused or repaired or upgraded should be provided with the appropriate instructions.		P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

7	**NORMAL SERVICE, MOUNTING AND TRANSPORT CONDITIONS**		
	Clause 7 of IEC 60947-1:2020 applies with the following addition:		
	Unless otherwise stated by the manufacturer, a contactor or a starter is for use in pollution degree 3 environmental conditions, as defined in 7.1.3.2 of IEC 60947-1:2020. However, other pollution degrees may be considered to apply, depending upon the micro-environment.	Pollution degree 3	P
	Rail mounting shall be specified according to IEC 60715:2017, when relevant.		P
	Altitude above 2 000 m are subjected to agreement between manufacturer and user.		P

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Clause	Requirement + Test	Result - Remark	Verdict

8.1	**Constructional requirements**		
	The equipment with its enclosure, if any, whether integral or not, shall be designed and constructed to withstand the stresses occurring during installation and normal use and, in addition, shall provide a specified degree of resistance to abnormal heat and fire		P
8.1.2	Materials		
8.1.2.1 Part 1	Parts of insulating materials which might be exposed to thermal stresses due to electrical effects, within the equipment, shall not be adversely affected by abnormal heat and by fire.		P
	Test method used :		
8.1.2.2 Part 1	Glow wire testing	(See 8.2.1.1.1 part 1 below)	P
	When tests on the equipment or on sections taken from the equipment are used, parts of insulating materials necessary to retain current-carrying parts in position shall conform to the glow-wire tests of 8.2.1.1.1 of IEC 60947-1:2020 at a test temperature of 850 °C		P
8.1.2.3 Part 1	Test based on flammability category	(See 8.2.1.1.2 part 1 below)	N/A
8.1.3	Current-carrying parts and their connection		
8.1. 3 Part 1	No contact pressure through insulating materials		P
8.1.4	Clearances and creepage distances		
	Clearances		P
	Rated impulse withstand voltage (see test sequence I)	Uimp=6kV for Main circuits Uimp=4kV for Auxiliary circuits	P
	Creepage distances		P
	Pollution degree ..... :	III	P
	Comparative tracking index (V) ..... :	175V	P
	Material group ..... : Rated insulation voltage Ui (V) ..... :	IIIa Ui = 690V	P
	Minimum creepage distance (mm) ..... :	10mm for Main circuits 6,3mm for Auxiliary circuits	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Measured creepage distance (mm) ..... :	19,6mm for Main circuits 19,6mm for Auxiliary circuits	P
8.1.5	Actuator		
8.1.5.1 Part 1	Insulation		
	The actuator of the equipment shall be insulated from the live parts for the rated insulation voltage and, if applicable, the rated impulse withstand voltage.		N/A
	If the actuator is made of metal, it shall be capable of being satisfactorily connected to a protective conductor unless it is provided with additional reliable insulation;		N/A
	If the actuator is made of or covered by insulating material, any internal metal part, which might become accessible in the event of insulation failure, shall also be insulated from live parts for the rated insulation voltage.		N/A
8.1. 5.2 Part 1	Direction of movement		
	The direction of operation for actuators of devices shall normally conform to IEC 60447.		N/A
	Where devices cannot conform to these requirements, e.g. due to special applications or alternative mounting positions, they shall be clearly marked such that there is no doubt as to the "I" and "O" positions and the direction of operation.		N/A
8.1.5.3	Mounting		
	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		N/A
8.1.5.4	Protection		
	There shall be no path or opening which allows incandescent particles to be discharged from the area of the manual operating means.		N/A
8.1.6	Indication of contact position		
8.1. 6.1 Part 1	Indication means, applies to manually operated starters		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated. This is done by means of a position indicating device		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	If symbols are used, they shall indicate the closed and open positions respectively, in accordance with IEC 60417-2: 60417-2-IEC-5007 I On (power) 60417-2-IEC-5008 O Off (power)		N/A
	For equipment operated by means of two push-buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O"		N/A
	Red colour shall not be used for any other push-button		N/A
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073		N/A
8.1. 6.2 Part 1	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided		N/A
8.1.7	Additional requirements for equipment suitable for isolation		
	If the tripped position of the MPSD is not the indicated open position, it should be clearly visible that it is not the open position. The verification of the main contact position for a manual starter and a MPSD suitable for isolation shall be tested according to 9.3.3.2.3.		N/A
	MPSDs and manual motor starter suitable for isolation shall be provided with means for locking in the open position.		N/A
8.1.7.1 part 1	Additional constructional requirements:		
	Equipment suitable for isolation shall provide in the open position an isolation distance in accordance with the requirements necessary to satisfy the isolating function		N/A
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) ..... :		N/A
	- measured clearances (mm) ..... :		N/A
	- test Uimp across gap (kV) ..... :		N/A
	Indication of the position of the main contacts shall be provided by one or more of the following means		N/A
	- the position of the actuator		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- a separate mechanical indicator		N/A
	- visibility of all moving main contacts		N/A
	The effectiveness of each of the means of indication provided on the equipment and its mechanical strength shall be verified	(See 8.2.5 part 1 below)	N/A
	When means are provided or specified by the manufacturer to lock the equipment in the open position, locking in that position shall only be possible when the main contacts are in the open position	(See 8.2.5 part 1 below)	N/A
	Equipment shall be designed so that the actuator, front plate or cover are fitted to the equipment in a manner which ensures correct contact position indication and locking, if provided		N/A
	For equipment provided with positions such as “tripped position” or “standby position”, which are not the indicated open position, those positions shall be clearly identified. The marking of such positions shall not include the symbols “I” or “O”		N/A
	An actuator having only one position of rest shall not be considered as appropriate to indicate the position of the main contact		N/A
8.1.7.2 part 1	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)		N/A
	Time interval between opening of the contacts of the auxiliary contact and the contacts of the main poles: ≥20 ms ..... :		N/A
	Measured time interval (ms) ..... :		N/A
	During the closing operation the contacts of the auxiliary switch closes after or simultaneously with the contacts of the main poles		N/A
8.1.7.3 part 1	Supplementary requirements for equipment provided with means for padlocking the open position:		
	The locking means is so designed that it cannot be removed with the appropriate padlock(s) installed		N/A
	Test force F applied to the actuator in an attempt to operate to the closed position (N) ..... :		N/A
	Rated impulse withstand voltage (kV) ..... :		N/A
	Test Uimp on open main contacts at the test force		N/A
8.1.8	Terminals		

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Clause	Requirement + Test	Result - Remark	Verdict
	Constructional requirements		
8.1.8.1 part 1	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength	(see 8.2.4 part 1 below)	P
	Terminal connections shall be such that necessary contact pressure is maintained	(see 8.2.4 part 1 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 part 1 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 part 1 below)	P
	If required by application, terminals and conductors may be connected by means of cable lugs for copper conductors only		N/A
	Screwless-type clamping units, unless otherwise specified by the manufacturer, shall accept rigid and flexible conductors as indicated in Table 1.		N/A
8.1.8.2 part 1	Connecting capacity		
	type of conductors .....:	Rigid and flexible	
	minimum cross-sectional area of conductor (mm^2) .....:	Main circuits terminals: 2,5mm^2 Auxiliary circuits terminals: 0,5mm^2 Control circuits terminals: 0,5mm^2	P
	maximum cross-sectional area of conductor (mm^2) .....:	Main circuits terminals: 25mm^2 Auxiliary circuits terminals: 1,5mm^2 Control circuits terminals: 1,5mm^2	P
	number of conductors simultaneously connectable to the terminal .....:	Main circuits terminals: 2,5mm^2 for 1+25mm^2 for 1 Auxiliary circuits terminals: 0,5mm^2 for 1+1,5mm^2 for 1 Control circuits terminals: 0,5mm^2 for 1+1,5mm^2 for 1	P
8.1.8.3 part 1	Connection		
	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

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.8.2	Terminal identification and marking,		
	marking complies with Annex A		P
8.1.8.4 part 1	Terminal identification and marking,		
	terminal intended exclusively for the neutral conductor		N/A
	protective earth terminal		N/A
	other terminals		N/A
8.1.9	Additional requirements for equipment provided with a neutral pole		
8.1.9 part 1	marking of the neutral pole		N/A
	The switched neutral pole shall not break before and shall not make after the other poles		N/A
	Conventional thermal current of neutral pole		N/A
	Equipment having a value Ith < 63 A, this value shall be identical for all poles		N/A
	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.		N/A
	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.		N/A
8.1.10	Provisions for protective earthing		
8.1.10.1 part 1	The exposed conductive parts shall be electrically interconnected and connected to a protective earth terminal		N/A
8.1.10.2 part 1	The protective earth terminal shall be readily accessible		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	The electrical continuity between the exposed conductive parts of the protective earth terminal and the metal sheathing of connecting conductors		N/A
	The protective earth terminal shall have no other functions		N/A
8.1.10.3 part1	The protective earth terminal shall be clearly and permanently identified by its marking.		N/A
8.1.10.4 part1	All exposed conductive parts of the equipment and/or its enclosure shall be effectively connected to the terminal for the incoming external protective conductor.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The resistance of the circuit from the exposed conductive part to the protective earth terminal shall not exceed 0,1 Ω.		N/A
8.1.11	Enclosure for equipment		
8.1.11.1 part1	Design		
	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.		N/A
	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.		N/A
	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.		N/A
	The enclosure, when it is opened: all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space shall be provided inside the enclosure		N/A
	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		N/A
	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		N/A
	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		N/A
	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		N/A
8.1.11.2 part1	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		N/A
8.1.12	Degree of protection of enclosed equipment		
8.1.12 part1	Degrees of protection of enclosed equipment and relevant tests are given in Annex C of IEC 60947-1:2020	(see 8.2.3 part 1 below)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.13	Conduit pull-out, torque and bending with metallic conduits		
8.1.13 part1	Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending	(see 8.2.7 part 1 below)	N/A
8.1.14	Limited energy source		
8.1.14.2	Limited energy source with galvanic separation		
	The output is inherently limited in compliance with Table 19; or		
	A linear or non-linear impedance limits the output in compliance with Table 19. If a positive temperature coefficient device (e.g. PTC) is used, it shall pass the applicable tests specified in IEC 60730-1;		N/A
	A regulating network limits the output in compliance with Table 19, both with and without a single fault in the regulating network;		N/A
	An over-current protective device is used and the output is limited in compliance with Table 20.		N/A
	Type of overcurrent protection device ……:		N/A
8.1.14.3	Limited energy source with current limiting impedance		
	The output voltage is limited in compliance with Table 21 and a linear or non-linear impedance limits the output in compliance with Table 21 both with and without a single fault.		N/A
8.1.15	Stored charge energy circuit		
	Parts including stored charge (capacitors) that are removable for servicing (such as coil replacement), installation, or disconnection shall present no risk of electric energy hazard after disconnection.		N/A
	Capacitors connected to accessible hazardous live parts shall be discharged to an energy level less than 0,5 mJ within 5 s after the removal of power.		N/A
8.1.16	Fault and abnormal conditions		
	The product shall be designed to avoid operating modes or sequences that can cause a fault condition or component failure leading to a hazard.		N/A
8.1.17	Short-circuit and overload protection of ports		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Where the power source for a signal port or power port that is external to the device does not comply with the requirements for limited energy sources in 8.1.14, the product shall not present a hazard under short-circuit or overload conditions. Instructions for the installation of external overcurrent protection shall be made available in accordance with 6.3.		N/A
8.1.18	Use of voltage transient limiting device		
	A varistor shall comply with IEC 61051-2 or IEC 61643-331 taken into account the appropriate climatic categories and a maximum continuous voltage of at least 1,25 times the rated voltage of the circuit.		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**Performance requirements**		
A	Starters shall be so constructed that they:		
	a) are trip free;		N/A
	b) can be caused to open their contacts by the means provided when running and at any time during the starting sequence;		N/A
	c) will not function in other than the correct starting sequence.		N/A
B	Starters employing contactors shall not trip due to the shocks caused by operation of the contactors when tested according to 9.3.3.1, after the starter has carried its rated full load current at the reference ambient temperature (i.e. +20 °C) and has reached thermal equilibrium at both minimum and maximum settings of the overload relay, if adjustable	(see 9.3.3.1 below)	N/A
C	For rheostatic starters, the overload relay shall be connected in the stator circuit.		N/A
	Special arrangements may be made to protect the rotor contactors and resistors against overheating, if requested by the user		N/A
D	When starters are used in conditions in which the overheating of the starting resistors or transformers would represent an exceptional hazard, it is recommended that a suitable device be fitted to switch off the starter automatically before a dangerous temperature is reached.		N/A
E	The moving contacts of multipole equipment intended to make and break together shall be so coupled that all poles make and break substantially together, whether operated manually or automatically		P
8.2.1.2	Limits of operation of contactors and power-operated starters	(see 9.3.3.2 below)	P
	MPSDs shall be trip-free (see 3.6.24 of IEC 60947-1:2020) and shall have their energy for the tripping operation stored automatically prior to the completion of the closing operation.		N/A
8.2.1.3	Limits of operation of under-voltage relays and releases	(see 9.3.3.2.2 below)	N/A
8.2.1.4	Limits of operation of shunt-coil operated releases (shunt trip)	(see 9.3.3.2.2 below)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.1.5	Limits of operation of current sensing relays and releases	(see 9.3.3.2.2 below)	N/A
8.2.2	Temperature rise	(see 9.3.3.3 below)	P
8.2.2.3	Accessible parts		P
	When an equipment includes accessible hot functional surfaces or hot adjacent surfaces on which the temperature-rise exceed the limits in Table 3 of IEC 60947-1:2020, the equipment shall be marked on these hot surfaces with ISO symbol 7010-W017 (2011-05) "Warning; Hot surface" and include any relevant information in the equipment documentation.		P
	When the housing does not permit marking due to size and/or form, only a reference in the equipment documentation may be provided.		P
8.2.3	Dielectric properties	(see 9.3.3.4 below)	P
8.2.4	Normal load and overload performance requirements		P
8.2.4.1	Making and breaking capacities	(see 9.3.3.5 below)	P
8.2.4.2	Conventional operational performance	(see 9.3.3.6 below)	P
8.2.4.3	Durability	(see annex B below)	N/A
8.2.4.4	Overload current withstand capability of contactors and IMPSD	(see 9.3.5 below)	P
8.2.4.5	Coil power consumption	(see 9.3.3.2.1.2 below)	P
8.2.4.6	Pole impedance	(see 9.3.3.2.1.3 below)	P
8.2.4.7	Ability of a MPSD to make and break under short-circuit conditions	(see annex P below)	N/A
8.2.5	Co-ordination with short-circuit protective devices	(see 9.3.4 below)	P

8.3	**Electromagnetic compatibility (EMC)**		
	Environment A		N/A
	Environment B		N/A
8.3.2	Immunity	(see 9.4 below)	N/A
8.3.3	Emission	(see 9.4 below)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.4	**Embedded software**		
	The development and testing of embedded software shall be managed		N/A
8.5	**Security**		
	Based on a security risk assessment, security measures shall be implemented according to IEC TS 63208.		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.2	**Compliance with constructional requirements**		
9.2.2 part 1	Test of materials to abnormal heat and fire		
9.2.2.1 part 1	Glow wire test (on equipment)		
	The suitability of materials used is verified by making tests: a) on the equipment; or b) on sections taken from the equipment; or c) on samples of identical material	b) on sections taken from the equipment	P
	The suitability shall be determined with respect to resistance to abnormal heat and fire		P
	The manufacturer shall indicate which tests, amongst a), b) and c), shall be used	☐ a) ☒ b) ☐ c)	P
	As described in IEC 60695-2-10 and –2-11		P
	parts retaining current-carrying parts ..... Remark : a protective conductor is not considered as a current-carrying part	☐ 850 ± 15°C or ☒ 960 ± 15°C Enclosure: 960°C Extinguish at 4s Contactor support: part: 960°C Extinguish at 3s Control circuit support part: part: 960°C Extinguish at 3s	P
	all other parts	☒ 650 ± 10°C Fixing mean: 650°C Terminal cover: 650°C No visible flame and no sustained glowing	P
	No visible flame, no sustained glowing or flames and glowing extinguish within 30 s		P
	For the purpose of this test, a protective conductor is not considered as a current-carrying part.		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.2.2 part 1	Flammability, hot wire ignition and arc ignition tests (on materials)		
	Suitable specimens of material shall be subjected to the following tests: a) flammability tests, in accordance with IEC 60695-11-10 b) Hot wire ignition (HWI) test, as described in Annex M c) Arc ignition (AI) test, as described in Annex M		N/A
	The test c) is required only if the material is located within the 13 mm of arcing parts or live parts which are subject to loosening of connections.		N/A
	Materials located within 13 mm of arcing arts are exempt from this test if the equipment is subjected to make/break testing.		N/A
a)	Flammability tests, in accordance with IEC 60695-11-10		N/A
	Test method	☐ A) – Horizontal burning test ☐ B) – Vertical burning test	N/A
b)	Hot wire ignition (HWI) test, as described in Annex M		N/A
c)	Arc ignition (AI) test, as described in Annex M		N/A
9.2.4 part 1	Enclosure for equipment's		
	Degree of protection .....:	IP20 for front cover	P
	Test for first characteristic		
	Test for first numeral .....:	1: 2: IP2X This clause is for enclosed equipment and is not applicable to this product. However, the test was conducted on the front cover of the product with positive result 3: 4: 5: 6:	P
	Test for second characteristic		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test for second numeral .....:	1: 2: 3: 4: 5: 6: 7: 8:	N/A
9.2.5 part 1	Mechanical and electrical properties of terminals		
9.2.5.2 part 1	Test of mechanical strength of terminals		
	maximum cross-section of conductor (mm²) :	25 mm² for Main circuits terminals 1,5 mm² for Auxiliary circuits terminals 1,5 mm² for control circuits terminals	P
	diameter of thread (mm) .....:	7,6 mm for Main circuits terminals 3,3 mm for Auxiliary circuits terminals 3,3 mm for control circuits terminals	P
	torque (Nm) .....:	6 Nm for Main circuits terminals 0,8 Nm for Auxiliary circuits terminals 0,8 Nm for control circuits terminals	P
	5 times on 2 separate clamping units		P
9.2.5.3 part 1	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the minimum cross-section area (mm²) .....:	2,5 mm² for Main circuits terminals 0,5 mm² for Auxiliary circuits terminals 0,5 mm² for control circuits terminals	P
	number of conductor of the minimum cross-section .....:	2	P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	diameter of bushing hole (mm) .....:	9,5 mm for Main circuits terminals 6,5 mm for Auxiliary circuits terminals 6,5 mm for control circuits terminals	P
	height between the equipment and the platen (mm) .....:	280 mm for Main circuits terminals 260 mm for Auxiliary circuits terminals 260 mm for control circuits terminals	P
	mass at the conductor(s) (kg) .....:	0,7kg for Main circuits terminals 0,3kg for Auxiliary circuits terminals 0,3kg for control circuits terminals	P
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	135 continuous revolutions	P
9.2.5.4 part 1	Pull-out test		
9.2.5.4.1 part 1	Round copper conductors		
	force (N) .....:	50N for Main circuits terminals 20N for Auxiliary circuits terminals 20N for control circuits terminals	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
9.2.5.4.2 part 1	Flat copper conductors		
	force (N) .....:	50N for Main circuits terminals 20N for Auxiliary circuits terminals 20N for control circuits terminals	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
9.2.5.3 part 1	Testing for damage to and accidental loosening of conductor (flexion test)		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	conductor of the maximum cross-section (mm²) ..:	25 mm² for Main circuits terminals 1,5 mm² for Auxiliary circuits terminals 1,5 mm² for control circuits terminals	P
	number of conductor of the maximum cross-section .....:	2 for Main circuits terminals 2 for Auxiliary circuits terminals 2 for control circuits terminals	P
	diameter of bushing hole (mm) .....:	13,0mm for Main circuits terminals 6,5mm for Auxiliary circuits terminals 6,5mm for control circuits terminals	P
	height between the equipment and the platen (mm) .....:	300mm for Main circuits terminals 260mm for Auxiliary circuits terminals 260mm for control circuits terminals	P
	mass at the conductor(s) (kg) .....:	4,5kg for Main circuits terminals 0,4kg for Auxiliary circuits terminals 0,4kg for control circuits terminals	P
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	135 continuous revolutions	P
9.2.5.4 part 1	Pull-out test		
9.2.5.4.1 part 1	Round copper conductors		
	force (N) .....:	135N for Main circuits terminals 40N for Auxiliary circuits terminals 40N for control circuits terminals	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
9.2.5.4.2 part 1	Flat copper conductors		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	force (N) .....:	135N for Main circuits terminals 40N for Auxiliary circuits terminals 40N for control circuits terminals	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
9.2.5.3 part 1	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the largest and minimum cross-section (mm²) .....:	25mm²/2,5mm² for Main circuits terminals 1,5mm²/0,5mm² for Auxiliary circuits terminals 1,5mm²/0,5mm² for control circuits terminals	P
	number of conductor of the minimum cross-section, number of conductor of the maximum cross-section .....:	1+1	P
	diameter of bushing hole (mm) .....:	13,0mm/9,5mm for Main circuits terminals 6,5mm/6,5mm for Auxiliary circuits terminals 6,5mm/6,5mm for control circuits terminals	P
	height between the equipment and the platen (mm) .....:	300mm/280mm for Main circuits terminals 260mm/260mm for Auxiliary circuits terminals 260mm/260mm for control circuits terminals	P
	mass at the conductor(s) (kg) .....:	4,5kg/0,7kg for Main circuits terminals 0,4kg/0,3kg for Auxiliary circuits terminals 0,4kg/0,3kg for control circuits terminals	P
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	135 continuous revolutions	P
9.2.5.4 part 1	Pull-out test		
9.2.5.4.1 part 1	Round copper conductors		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	force (N) .....:	135N/50N for Main circuits terminals 40N/20N for Auxiliary circuits terminals 40N/20N for control circuits terminals	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
9.2.5.4.2 part 1	Flat copper conductors		
	force (N) .....:	135N/50N for Main circuits terminals 40N/20N for Auxiliary circuits terminals 40N/20N for control circuits terminals	P
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit		P
9.2.5.5 part 1	Test for insertability of unprepared round copper conductors having the maximum cross-section		
	Test gauge .....:	A7 for Main circuits terminals A1 for Auxiliary circuits terminals A1 for Control circuits terminals	P
	The measuring section of the gauge shall be able to penetrate freely into the terminal aperture to the full depth of the terminal		P
	Alternatively, the test can be carried out by inserting the largest conductor of type and rated cross-section among those recommended by the manufacturer, after the insulation has been removed and the end has been reshaped .....:		N/A
	The stripped end of the conductor shall be able to enter completely within the clamping unit aperture, without use of undue force		P
9.2.2	Electrical performance of screwless-type clamping units		
	Test according to subclause 9.8 of IEC 60999-1 and 9.8 of IEC 60999-2	See report _____	N/A
	The number of specimens shall be at least 4.		N/A
	Test current is I_{th}.		N/A
9.2.3	Ageing test for screwless-type clamping units		
	Test according to subclause 9.10 of IEC 60999-1 and 9.10 of IEC 60999-2	See report _____	N/A
	Test current is I_{th}.		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.2.4	Limited energy source test		
	Equipment operating under normal conditions		N/A
	In case the limited energy source requirement depends on over-current protective device(s), the device(s) shall be short-circuited.		N/A
	Maintain the limited VA energy for a period specified in 8.1.14……:		N/A
	Maintain the limit of apparent energy for the time period indicated in Table 19, Table 20, or Table 21, as applicable……..:		N/A
	Available apparent energy does not exceed the limits indicated in Table 19, Table 20, or Table 21, as applicable……..:		N/A
	In case the limited energy source requirement depends on over-current protective device(s), the current rating of at least one of the protective device(s) in the current path shall not exceed the limit in Table 20.		N/A
	Test conducted under the most unfavourable combination		N/A
9.2.5	Breakdown of components		
	Tested with the product operating with the load creating the more severe condition		N/A
	Each identified component shall be subjected to a breakdown of components test in open- and or short-circuit failure modes, whichever is most severe		N/A
	no emission of flame or molten metal		N/A
	no ignition of cotton		N/A
	no opening of the fusible element F (according to subclause 9.3.4.1.2 d) of IEC 60947-1:2020)		N/A
9.2.6	Wire flexing test		
	Wiring to components mounted on a door or cover is to be tested by opening the door or cover as far as possible and then closing it for 500 cycles of operation.	500 cycles	N/A
9.3.3.4	Test of dielectric properties		
9.3.3.4.1 Part 1	2) Verification of impulse withstand voltage		
	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		P
	- rated impulse withstand voltage (kV) :	6 kV for main circuit 4 kV for auxiliary circuit	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	7,3kV	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- test Uimp auxiliary circuits (kV) :	4,8kV	P
	- test Uimp control circuits (kV) :		N/A
	Application of test voltage		
	Between the conductors		P
	Between conductors and ground		P
9.3.3.4.1 Part 1	3) Power-frequency withstand verification of solid insulation		
	- rated insulation voltage (V) :	690V	P
	- main circuits, test voltage for 1 min (V)	1890V	P
	- auxiliary circuits, test voltage for 1 min (V)	1890V	P
	- control circuits, test voltage for 1 min (V)		N/A
	Application of test voltage		
	Between the conductors		P
	Between conductors and ground		P
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur		P
9.2.6 part 1	Verification of the effectiveness of indication of the main contact position of equipment suitable for isolation		
9.2.6.2.1 part 1	Dependent and independent manual operation		
	actuating force for opening (N) ..... :		N/A
	means to keep the contact(s) closed and the number of contacts……..…:		N/A
	test force for 10 s (N) ..... :		N/A
	After the test, when the test force is no longer applied, the actuator being left free, the open position shall not be indicated by any of the means provided		N/A
	the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with a means of locking in the open position, it shall not be possible to lock the equipment while the test force is applied		N/A
9.2.6.2.2 part 1	Dependent power operation		

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Clause	Requirement + Test	Result - Remark	Verdict
	means to keep the contact(s) closed and the number of contacts……..…:		N/A
	Supply voltage of 110% of rated voltage (V)…….:		N/A
	Three attempts of 5 s to operate the equipment at intervals of 5 min.		N/A
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test		N/A
9.2.6.2.3 part 1	Independent power operation		
	means to keep the contact(s) closed and the number of contacts……..…:		N/A
	Three attempts to operate the equipment by the stored energy.		N/A
	Lock ability of driving mechanism in OFF-position at test force and blocked main contacts ..... :		N/A
	Position indicator does not show OFF-position after capture of test force at blocked main contacts		N/A
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation		N/A
	When the equipment is provided with means for locking in the open position, it shall not be possible to lock the equipment during the test		N/A
9.2.8 part 1	Conduit pull-out test, torque test and bending test with metallic conduits		
9.2.8.2 part 1	Pull-out test		
	Torque for screwing the conduit into the entry.....:		N/A
	Pull force (N) .....:		N/A
	5 min, the displacement of the conduit in relation with the entry shall be less than one thread depth		N/A
	There shall be no evidence of damage impairing further use of the enclosure		N/A
9.2.8.3 part 1	Bending test		

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Clause	Requirement + Test	Result - Remark	Verdict
	A slowly increasing bending moment shall be applied without jerk to the free end of the conduit		N/A
	Bending moment is maintained at.....:		N/A
	1 min		N/A
	The test is then repeated in a perpendicular direction		N/A
	There shall be no evidence of damage impairing further use of the enclosure		N/A
9.2.8.4 part 1	Torque test		
	Torque (Nm) .....:		N/A
	it shall be possible to unscrew the conduit and there shall be no evidence of damage impairing further use of the enclosure		N/A
9.2.9.2 part 1	Earth continuity test		
	test current ≥ 10 A (A).....:		N/A
	cross section (mm^2).....:		N/A
	resistance (Ω).....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
a)	**TEST SEQUENCE 1** #1: CJX2i-65 Us:440V~ 50/60Hz #2: CJX2i-65 Us:415V~ 50/60Hz #3: CJX2i-65 Us:380/400V~ 50/60Hz #4: CJX2i-65 Us:240V~ 50/60Hz #5: CJX2i-65 Us:220/230V~ 50/60Hz #6: CJX2i-65 Us:127V~ 50/60Hz #7: CJX2i-65 Us:110V~ 50/60Hz #8: CJX2i-65 Us:48V~ 50/60Hz #9: CJX2i-65 Us:36V~ 50/60Hz #10: CJX2i-65 Us:24V~ 50/60Hz		
	- verification of temperature rise (Clause 9.3.3.3.)		
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		
	- verification of dielectric properties (Clause 9.3.3.4)		
9.3.3.3	Temperature rise		
	Sub clause 9.3.3.3. of IEC 60947-1:2020 applies		
	ambient temperature 10-40 °C .....:	22,6°C	P
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:		N/A
	material of enclosure .....:		N/A
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 9.3.3.3.4 of IEC 60947-1:2020 applies with following addition		
	loaded as stated in 8.2.2.5		P
	- setting of the maximum current setting.....:		N/A
	- setting overload relay.....:		N/A
	- conventional thermal current Ith (A) .....:	80,0A for Main circuit 10,0A for Auxiliary circuit	P
	- conventional enclosed thermal current Ithe (A) .:		N/A
	- for equipment intended for utilization category AC-6b, the test current for the temperature rise test shall be equal to 1,35 times Ie (the rated capacitive current).		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable/busbar cross-section (mm²) / (mm) .....:	25mm²/1m for main circuit 1,5mm²/1m for Auxiliary circuit	P
	- temperature rise of main circuit terminals (K) ....:	< 56,9 K see page 92	P
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 9.3.3.3.5. of part 1 applies with following addition		
	The temperature rise shall be measured during the test of 9.3.3.3.4		N/A
	- conventional thermal current Ith (A) at their rated voltage.....:		N/A
	- conventional enclosed thermal current Ithe (A) .:		N/A
	- cable/busbar cross-section (mm²) / (mm) .....:		N/A
	- temperature rise of control circuit (K) .....:	<_____ K see page ____	N/A
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	The coil with the highest measured holding power consumption, for a given frequency a.c. or d.c., according to 9.3.3.2.1.2.2 is deemed to be representative for all coils, for the same contactor, and shall be used for the temperature rise test.		
	a) Uninterrupted and eight-hour duty windings (8.2.2.7.1)		
	The temperature rise shall be measures during the test of 9.3.3.3.4		P
	- rated control supply voltage Us (V) .....:	440V~	P
	- class of insulating material .....:	B	P
	- uninterrupted or eight-hour duty windings	Uninterrupted	P
	- temperature rise of control circuit terminals (K) .:	< 57,7 K see page 92	P
	b) Intermittent duty windings (8.2.2.7.2)		
	- no current flowing though the main circuit		P
	- rated control supply voltage Us (V) .....:	440V~	P
	- class of insulating material .....:	B	P
	- intermittent duty class .....:	3	P
	- close open operating cycle .....:	1200s/h	P
	- on-load factor .....:	40%	P
	- temperature rise of control circuit terminals (K) .:	< 37,9 K see page 92	
	c) temporary or periodic duty (8.2.2.7.3)		N/A
	- no current flowing though the main circuit		N/A
	- rated control supply voltage Us (V) .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- class of insulating material .....:		N/A
	- close open operating cycle .....:		N/A
	- on-load time .....:		N/A
	- temperature rise of control circuit terminals (K) .:	< ____ K see page ____	N/A
9.3.3.3.7	Auxiliary circuit, test conditions:		
	Normally loaded with their maximum rated operational current at any convenient voltage	10,0A	P
	The temperature rise shall be measures during the test of 9.3.3.3.4		P
	- conventional thermal current Ith (A).....:	10A	P
	- conventional enclosed thermal current Ithe (A) .:		N/A
	- cable/busbar cross-section (mm²) / (mm) .....:	1,5mm²/1mm	P
	- cable cross-section (mm²) .....:		N/A
	- temperature rise of auxiliary circuit terminals (K) :	< 20,6 K see page 92	P
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m		N/A
	Number of starts per hour .....:		N/A
	Rated duty .....:		N/A
	Starting characteristic	See page _____	N/A
	- cable/busbar cross-section (mm²) / (mm) .....:		N/A
	- cable cross-section (mm²) .....:		N/A
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of IEC 60947-1	N/A
	- temperature rise of starting resistor enclosure (K) .....:	See table 3 of IEC 60947-1	N/A
	- temperature rise of issuing air (K) ……:	See table 3 of IEC 60947-1	N/A
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$		N/A
	Number of starts per hour .....:		N/A
	Rated duty .....:		N/A
	Starting characteristic.....:	See page	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable/busbar cross-section (mm²) / (mm) .....:		N/A
	Temperature rise of:		
	- windings (K), See table 5 (+15 K) .....:		N/A
	- operating means (K) , See table 3 of part 1.....:		N/A
	- parts intended to be touched but not hand held (K) , See table 3 of part 1		N/A
	- parts which need not be touched during normal operation (K) , See table 3 of part 1		N/A
9.3.3.3.10	Starters declared as suitable for use downstream of a basic drive module (BDM)		
	the test shall be performed with a BDM compliant with IEC 61800-5-1 used as the main supply		
	the BDM shall operate in normal operating conditions at the conditions declared in 6.1.2 w).		
	The rated voltage pulse slope is equal to the voltage pulse slope with the maximum d*V*/d*t* measured from 10 % to 90 % of the output voltage of the BDM.		N/A
	The measurement method shall cover a bandwidth of at least 0 Hz to 100 kHz but not less than ten times the maximum output pulse frequency of the BDM.		N/A
9.3.3	Performance under no load, normal load and overload conditions		
9.3.3.1	Operation		
	For starter only:		
	reference ambient temperature (i.e. +20 °C) :		N/A
	Rated full load current (A) :		N/A
	No tripping after 3 operations when stator has reached thermal equilibrium at minimum and maximum settings		N/A
	For overload relay with combined stop and reset actuating mechanism only		
	With closed contactor, the resetting mechanism shall be operated and this shall cause the contactor drop out		N/A
	For overload relay with either a reset or separate stop and reset mechanism only		
	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		N/A
9.3.3.2	Operating limits		
9.3.3.2.1	Power-operated equipment:		

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.1.2	Limits of operation of contactors and power-operated starters		
8.2.1.2 Part 1	Limits of operation of power operated equipment		
	rated control circuit supply voltage Us (V) .....:	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC	P
	frequency (Hz) .....:	50/60Hz	P
	rated air supply pressure ……..:		N/A
	ambient temperature ……:	Between -5 °C and +40 °C	P
	operation range……..:	85% to 110%	P
	close at any value between 85% and 110% (V or bar) .....:	Test at 110% for Us: #1:484V(50/60Hz) #2:457V(50/60Hz) #3:440V(50/60Hz) #4:264V(50/60Hz) #5:253V(50/60Hz) #6:140V(50/60Hz) #7:121V(50/60Hz) #8:53V(50/60Hz) #9:40V(50/60Hz) #10:26V(50/60Hz) Test at 85% for Us: #1:374V(50/60Hz) #2:353V(50/60Hz) #3:323V(50/60Hz) #4:204V(50/60Hz) #5:187V(50/60Hz) #6:108V(50/60Hz) #7:94V(50/60Hz) #8:41V(50/60Hz) #9:31V(50/60Hz) #10:20V(50/60Hz)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	drop out voltage: 75% to 20% (or 10% if specified by manufacturer) for a.c. and 75% to 10% for d.c. (V) .....:	Drop out voltage between 20%xUs and 75%xUs: #1: 195~197V(50Hz) #2: 154~155V(50Hz) #3: 149~151V(50Hz) #4: 80~81V(50Hz) #5: 85~86V(50Hz) #6: 42~43V(50Hz) #7: 42~42V(50Hz) #8: 17~18V(50Hz) #9: 14~14V(50Hz) #10: 9~10V(50Hz) #1: 225~228V(60Hz) #2: 185~186V(60Hz) #3: 185~187V(60Hz) #4: 95~96V(60Hz) #5: 105~105V(60Hz) #6: 48~49V(60Hz) #7: 55~56V(60Hz) #8: 20~21V(60Hz) #9: 15~16V(60Hz) #10: 12~12V(60Hz)	P
	drop out pressure (bar) 75% to 10% of rated pressure…….……..:		N/A
	In the case of coils, the limiting drop-out values apply when the coil circuit resistance is equal to that obtained at –5 °C……:		P
	Calculated values……:		N/A
	Drop out time (if applicable)……..:		N/A
	For latched contactors, the device shall drop out and open fully when a de-latching voltage between 85 % and 110 % of the rated de-latching voltage is applied……..:		N/A
	MPSDs shall be trip-free and shall have their energy for the tripping operation stored automatically prior to the completion of the closing operation.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.2.1 part 1	Capacitive drop out test		
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.		N/A
	The capacitor is short-circuit by a switch of negligible impedance.		N/A
	The supply voltage shall then be adjusted to 110 % U_s.....:		N/A
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) .....:	_____nF	N/A
	Verification of the drop out of the contactor when the switch is operated to the open position.....:		N/A
	The test voltage is the highest value of the declared rated supply voltage range *Us*.		N/A
9.3.3.2.1.2 .1	Coil power consumption		
	A contactor coil is evaluated for both holding power and pick-up power		P
	The coil with the lowest rated control supply voltage Us, the coil with the highest rated control supply voltage Us, plus 3 coils deemed to be representative of the coils with the highest calculated hold power		P
	ambient temperature +23 °C ± 3 °C		P
	The test shall be made without any load in the main and auxiliary circuits		P
	rated control supply voltage Us (V)……:	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC	P
	rated frequency (Hz)……..:	50/60Hz	P
	For a given coil, where a voltage range is declared, the test shall be made at the highest voltage at the respective frequency		N/A
	The measured values shall be obtained with a r.m.s. measurement method covering at least a bandwidth from 0 Hz to 10 kHz and the resulting power values shall be given within a measurement uncertainty better than 5 %		P
9.3.3.2.1.2 .2	Holding power for conventional and electronically controlled electromagnet		

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Clause	Requirement + Test	Result - Remark	Verdict
	The current measurement I(i) of the coil shall be performed after the coil has been energized and has reached a stable temperature		P
	The holding power consumption is defined as follows		
	Sh(i) = Us(i) × I(i) [VA] for a.c. controlled electromagnet	#1:20,7VA(50Hz) #2:27,4VA(50Hz) #3:26,4VA(50Hz) #4:29,3VA(50Hz) #5:27,1VA(50Hz) #6:25,2VA(50Hz) #7:24,8VA(50Hz) #8:27,0VA(50Hz) #9:28,7VA(50Hz) #10:19,2VA(50Hz) #1:16,7VA(60Hz) #2:19,1VA(60Hz) #3:18,0VA(60Hz) #4:20,4VA(60Hz) #5:18,2VA(60Hz) #6:24,9VA(60Hz) #7:20,5VA(60Hz) #8:27,8VA(60Hz) #9:21,2VA(60Hz) #10:16,1VA(60Hz)	P
	Pc(i) = Us(i) × I(i) [W] for d.c. controlled electromagnet		N/A
	Sh = Σ (Us(i) × I(i)) / n [VA] respectively Pc = Σ (Us(i) × I(i)) / n [W] (n = number of tested coils)		P
	The published value shall be equal or higher than the average value of the tested coils		P
	For electronically controlled electromagnet with alternating current and direct current ratings, the measurement should be performed for both ratings		P
9.3.3.2.1.2.3	Pickup power for d.c. controlled electromagnet with separate pick-up and hold-on windings or a.c. controlled conventional electromagnet		

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Clause	Requirement + Test	Result - Remark	Verdict
	The pick-up measurement shall be performed directly after the measurement of the hold current (see 9.3.3.2.1.2.2)		P
	The current measurement I(i) of the coil shall be performed immediately after the coil has been de-energized, the contactor has been held in the Off position and re-energized		P
	The pick-up power consumption is defined as follows		P
	Sp(i) = Us × I(i) [VA] for a.c. controlled contactor	#1:188VA(50Hz) #2:254VA(50Hz) #3:251VA(50Hz) #4:265VA(50Hz) #5:242VA(50Hz) #6:251VA(50Hz) #7:221VA(50Hz) #8:210VA(50Hz) #9:218VA(50Hz) #10:154VA(50Hz) #1:179VA(60Hz) #2:206VA(60Hz) #3:207VA(60Hz) #4:201VA(60Hz) #5:185VA(60Hz) #6:252VA(60Hz) #7:191VA(60Hz) #8:283VA(60Hz) #9:208VA(60Hz) #10:163VA(60Hz)	P
	Pp(i) = Us × I(i) [W] for d.c. controlled contactor with separate pick-up and hold windings		N/A
	Sp = Σ (Us(i) × I(i)) / n [VA] respectively Pp = Σ (Us(i) × I(i)) / n [W] (n = number of tested coils)		P
	The published value shall be equal or higher than the average value of the tested coils		P
9.3.3.2.1.2.4	Pick-up power for electronically controlled electromagnet		

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Clause	Requirement + Test	Result - Remark	Verdict
	The pick-up measurement shall be performed directly after the measurement of the hold current (see 9.3.3.2.1.2.2)		N/A
	For a given coil, where a voltage range is declared, the test shall be carried out at the lowest and the highest value of the voltage range		N/A
	The contactor has been held in the OFF position and re-energized for the time necessary to perform the complete pick-up procedure.		N/A
	The current $I_{(i)}$ of each coil shall be measured during the whole time the electromagnet has been energized at its maximum power and has reached steady state conditions.		N/A
	The pick-up power consumption is defined as follows		N/A
	Sp(i) = Us × I(i) [VA]		N/A
	Sp = Σ (Us(i) × I(i)) / n [VA] (n = number of tested coils)		N/A
	The published value shall be equal or higher than the average value of the tested coils		N/A
	The absolute value of possible occurring current peaks during the whole pick-up process are less or equal to the following values of the peak ratio		
	Peaks duration range (ms) Maximum peak ratio From 0 to and including 0,1 7 Larger than 0,1 4 Larger than 1 2 Larger than 5 1,5		N/A
	In case the values are exceeded, these peak values in addition to the pick-up power shall be stated in the product documentation.		N/A
9.3.3.2.1.3	Pole impedance		
9.3.3.8 part 1	The pole impedance shall be determined during the test and with the conditions given in 9.3.3.3.4.		P
	The test in an enclosure is not deemed necessary even if the contactor can be used in an individual enclosure		P
	The voltage drop Ud shall be measured between the line and load terminals (terminals included) of the contactor preferably at the same time the temperature rise is measured		P
	The impedance per pole is defined as follows		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Z = Ud / Ith [Ω]	Test Sample: #1 CJX2i-65 during Clause 9.3.3.3 Temperature rise L1:1,0mΩ L2:1,0mΩ L3:1,0mΩ	P
	Care should be taken that voltage drop measurement does not significantly affect the temperature rise nor affect significantly the impedance		P
9.3.3.2.2	Relays and releases		
8.2.1.3	a) Operation of under-voltage relays and releases		
	When associated with a switching device, the release shall be fitted to the switching device having the maximum current rating for which the release is suitable		N/A
	1) Drop-out voltage		
	Rated control supply voltage(U) ..... :		N/A
	Frequency (Hz)..... :		N/A
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage .... :		N/A
	The voltage shall be reduced from rated control supply voltage at a rate to reach 0 V in approximately 30 s		N/A
	The test for the lower limit is made without previous heating of the release coil		N/A
	In the case of a release with a range of rated control supply voltage, this test applies to the maximum voltage of the range		N/A
	When associated with a switching device, the test for the lower limit is made without current in the main circuit		N/A
	The test for the upper limit is made starting from a constant temperature corresponding to the application of rated control supply voltage to the release and rated current in the main poles.		N/A
	This test may be combined with the temperature-rise test of 9.3.3.3.		N/A
	In the case of a release with a range of rated control supply voltage, this test is made at the minimum rated control supply voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	2) Test for limits of operation when associated with a switching device		
	Starting with the main circuit open, at the temperature of the test room, and with the supply voltage at 35 % rated maximum control supply voltage, it shall be verified that the switching device cannot be closed by the operation of its actuator		N/A
	When the supply voltage is raised to 85 % of the minimum control supply voltage, it shall be verified that the switching device can be closed by the operation of its actuator		N/A
	3) Performance under over-voltage conditions		
	When associated with a switching device, the test is made without current in the main circuit.		N/A
	The test at 110 % of the rated supply voltage shall be made for 30 min or until the temperature has reached thermal equilibrium and without impairing its functions. Verification shall be made according 2) above		N/A
8.2.1.4	b) Shunt-coil operated releases		
	When associated with a switching device, the release shall be fitted to the switching device having the maximum rated current for which the release is suitable		N/A
	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 ..... :		N/A
	In the case of a release having a range of rated control circuit supply voltages, the test voltages shall be 70 % of the minimum rated control circuit supply voltage and 110 % of the maximum rated control voltage		N/A
	c) Thermal, electronic and time-delay magnetic overload relays		
8.2.1.5	Limits of operation of current sensing relays and releases		
8.2.1.5.1	Limits of operation of time-delay overload relays when all poles are energized		
8.2.1.5.1.1	General tripping requirements of overload relays		
	type of time-delay overload relay ..... :		N/A
	trip class ..... :		N/A
	current setting ..... :		N/A
	ambient temperature °C) ..... :		N/A
	test enclosure W x H x D (mm x mm x mm) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) ..... :		N/A
	ambient temperature: - 5°C ..... :		N/A
	a) at A times of current setting, tripping shall not occur in less than 2 h starting from the cold state; test current ..... :	No tripping; ……A	N/A
	b) when the current is subsequently raised to B times the current setting, tripping shall occur in less than 2 h; test current ..... :	Tripping; …..A	N/A
	c) for class 2, 3, 5 and 10 A overload relays energized at *C* times the current setting, tripping shall occur in less than 2 min starting from thermal equilibrium, at the current setting, in accordance with 9.3.3 of IEC 60034-1; for class 10 An overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 4 minutes	Class; ____ Tripping current___ A Trip-time: ____ s	N/A
	d) for class 10, 20 , 30 and 40 overload relays energized at C times the current, tripping shall occur in less than 4, 8 or 12 min, starting from thermal equilibrium at the current setting; class; test current; tripping time .....:	Class; ____ Tripping current___ A Trip-time: ____ s	N/A
	e) at D times the current setting, tripping shall occur within the limits given in Table 2 for the appropriate trip class and tolerance band, starting from the cold state; test current; tripping time Tp (s) .....:	Class; ____ Tripping current___ A Trip-time: ____ s	N/A
	ambient temperature: + 20 °C .....:		N/A
	a) at A times of current setting, tripping shall not occur in less than 2 h starting from the cold state; test current .....:	Test current: ____ A	N/A
	b) when the current is subsequently raised to B times the current setting, tripping shall occur in less than 2 h; test current .....:	Test current Trip time: ____s	N/A
	c) for class 2, 3, 5 and 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 ..... :	Test current Trip time: ____s	N/A
	d) for class 10, 20 , 30 and 40 overload relays energized at C times the current, tripping shall occur in less than 4, 8 or 12 min, starting from thermal equilibrium at the current setting; class; test current; tripping time .....:	Test current Trip time: ____s	N/A
	e) at D times the current setting, tripping shall occur within the limits given in Table 2 for the appropriate trip class and tolerance band, starting from the cold state; test current; tripping time Tp (s) .....:	Class; ____ Tripping current___ A Trip-time: ____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 40 °C .....:		N/A
	a) at A times of current setting, tripping shall not occur in less than 2 h starting from the cold state; test current .....:	Test current: ____ A	N/A
	b) when the current is subsequently raised to B times the current setting, tripping shall occur in less than 2 h; test current .....:	Test current Trip time: ____s	N/A
	c) for class 2, 3, 5 and 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 .....:	Test current Trip time: ____s	N/A
	d) for class 10, 20 or 30 overload relays energized at C times the current, tripping shall occur in less than 4, 8 or 12 min, starting from thermal equilibrium at the current setting; class; test current; tripping time .....:	Test current Trip time: ____s	N/A
	e) 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) .....:	Class; ____ Tripping current___ A Trip-time: ____ s	N/A
8.2.1.5.1.2	Thermal memory test verification		
	Unless the manufacturer has specified that the device does not contain thermal memory, electronic overload relays shall fulfil the following requirements(see figure 8)		N/A
	Apply a current equal to Ie until the device has reached the thermal equilibrium	Ie = _____ A	N/A
	Interrupt a current for a duration of 2 x *Tp* (see Table 2) with a relative tolerance of 10% (where *Tp* is the time measured at the *D* current according to Table 3).	*Tp* = _____ *A* *D* = _____ A Measured time *Tp* = ____ s	N/A
	Apply a current equal to 7,2 x *Ie*	I test = _____ A	N/A
	The relay shall trip within 50% of the time *TP*	Trip time = _____ s	N/A
8.2.1.5.2	Limits of operation of three-pole time-delay overload relays energized on two poles:		
	ambient temperature (°C).....:		N/A
	In case of overload relays having an adjustable current setting, the characteristics shall apply both when the relay is carrying the current associated with the maximum setting and when the relay is carrying the current associated with the minimum setting		N/A
	a) 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	RT / S / RS / T / ST / R	N/A

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Clause	Requirement + Test	Result - Remark									Verdict
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole de-energized, tripping shall occur in less than 2 h; current value; test current	RT	S	RS	T	ST	R				N/A
	d) Instantaneous magnetic overload relays										
8.2.1.5.3	Limits of operation of instantaneous magnetic overload relays										
	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										N/A
	Magnetic settings…… :										N/A
	Accuracy ± 10% of the value……..:										N/A
	e) Short-circuit releases										
	ambient temperature .....:										N/A
	MPSD mounted in accordance with 8.2.2 …….:										N/A
	Test at minimum current setting:										N/A
	cable/busbar cross-section (mm²) / (mm) :										N/A
	test current equal to 80 % of the short-circuit current setting (A) ……..:										N/A
	No operation within 0,2 s										N/A
	test current equal to 120 % of the short-circuit current setting (A) ……..:										N/A
	Operating time (s) ……..:										N/A
	Test at maximum current setting:										N/A
	cable/busbar cross-section (mm²) / (mm) :										N/A
	Test current equal to 80 % of the short-circuit current setting (A) ……..:										N/A
	No operation within 0,2 s										N/A
	Test current equal to 120 % of the short-circuit current setting (A) ……..:										N/A
	Operating time (s) ……..:										N/A
	Additional single pole test for MPSD with electromagnetic over-current releases:										N/A
	Test current equal to 120 % of the short-circuit current setting (A) ……..:										N/A
	Operating time (s) ……..:										N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Value declared by the manufacturer……:		N/A
	f) Under-current relays		
8.2.1.5.4.1	Limits of operation under-current relays		N/A
	Under-current relays or release, when associated with a switching device, shall operate to open the switching device within 90% to 110 % of the set time when the current during run is below 0,9 times the under-current setting in all poles	Under current setting:_____A Test current:_____A Set time:_____s Measured:_____s	N/A
	g) Under-current relays in automatic change-over		
8.2.1.5.4.2	Limits of operation of automatic change over by under-current relays		N/A
	- for star-delta starters from star to delta, and - for auto-transformer starters from the starting to the ON position		N/A
	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.	Lowest drop-out:…….A / Actual current setting: …..A = ≤ 1,5 times	N/A
	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		N/A
8.2.1.5.5.	h) Stall relays		
	The limits of operation shall be verified accordance with cl. 8.2.1.5.5		N/A
	For currents sensing stall relays , the verification shall be made for the minimum and for the maximum set current values and for the minimum and maximum stall inhibit time(four settings)		N/A
	For stall relays operating in conjunction with a rotation sensing mean, the verification shall be made for the minimum and maximum stall inhibit time. The sensor can be simulated by an appropriate signal on the sensor input of the stall relay		N/A
	a) current sensing relays		
	minimum current setting / minimum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A
	minimum current setting / maximum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	maximum current setting / minimum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A
	maximum current setting / maximum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A
	b) rotation sensing relays: an input signal indicating no rotation exits		
	minimum set stall inhibit time	_____ s Trip time = _____s	N/A
	maximum set stall inhibit time	_____ s Trip time = _____s	N/A
8.2.1.5.6.	i) Jam relays		
	The limits of operation shall be verified accordance with cl. 8.2.1.5.6		N/A
	The verification shall be made for the minimum and for the maximum set current values and for the minimum and maximum stall inhibit time (four settings)		N/A
	For each of the four settings, the test shall be made under the following conditions:		N/A
	- apply a test current of 95% of the set current value. The jam relay shall not trip		N/A
	- increase the test current to 120 % of the set current value. The jam relay shall trip according to the requirements given in 8.2.1.5.6		N/A
	minimum current setting / minimum set stall inhibit time Test current 95 % of set value	_____ s _____ A no trip	N/A
	minimum current setting / minimum set stall inhibit time Test current increase to 1,2 times	_____ A _____ s Trip time = _____s	N/A
	minimum current setting / maximum set stall inhibit time Test current 95 % of set value	_____ s _____ A no trip	N/A
	minimum current setting / maximum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A
	maximum current setting / minimum set stall inhibit time	_____ s _____ A	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	no trip	
	maximum current setting / minimum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A
	maximum current setting / maximum set stall inhibit time Test current 95 % of set value	_____ s _____ A no trip	N/A
	maximum current setting / maximum set stall inhibit time Test current 1,2 times	_____ A _____ s Trip time = _____s	N/A
9.3.3.2.3	Verification of main contact position for manual starter and MPSD suitable for isolation		
9.2.6 Part 1	Verification of the effectiveness of indication of the main contact position of equipment suitable for isolation		
	Dependent and independent manual operation		
	- actuating force for opening (N) :		N/A
	- test force with blocked main contacts (N) :		N/A
	- used method to keep the contact closed :		N/A
	During and after the test, open position not indicated :		N/A
	Equipment with locking mean, no locking in the open position while test force is applied :		N/A
	Dependent power operation		
	- main contacts fixed together in the closed position :		N/A
	- used method to keep the contact closed :		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) :		N/A
	During and after the test, open position not indicated :		N/A
	Equipment show no damage impairing its normal operation :		N/A
	Equipment with locking mean, no locking in the open position while test force is applied :		N/A
	Independent power operation		
	- main contacts fixed together in the closed position :		N/A
	- used method to keep the contact closed :		N/A
	- stored energy of the power operator released (3 times) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During and after the test, open position not indicated :		N/A
	Equipment show no damage impairing its normal operation :		N/A
	Equipment with locking mean, no locking in the open position while test force is applied :		N/A
9.3.3.4	Test of dielectric properties		
9.3.3.4.1 Part 1	2) Verification of impulse withstand voltage		
	The 1,2/50µs impulse voltage shall be applied five times for each polarity at intervals of 1s minimum		P
	- rated impulse withstand voltage (kV) :	6 kV for main circuit 4 kV for auxiliary circuit	P
	- sea level of the laboratory:	Sea level	P
	- test Uimp main circuits (kV) :	7,3kV	P
	- test Uimp auxiliary circuits (kV) :	4,8kV	P
	- test Uimp control circuits (kV) :		N/A
	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		P
	- other circuits		P
	- exposed conductive parts		P
	- enclosure of mounting plate		P
	iv) equipment suitable for isolation		
	Across the poles of the main circuit, the line terminals being connected together and the load terminals connected together.		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) :		N/A
	No unintentional disruptive discharge during the tests		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.4.1 Part 1	3) Power-frequency withstand verification of solid insulation		
	- rated insulation voltage (V) :	690V	P
	- main circuits, test voltage for 1 min (V)	1890V	P
	- auxiliary circuits, test voltage for 1 min (V)	1890V	P
	- control circuits, test voltage for 1 min (V)	1890V	P
	Application of test voltage		
	i) Between all terminals of the main circuit connected together (incl. control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	ii) Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation.		P
	iii) Between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit		P
	- other circuits		P
	- exposed conductive parts		P
	- enclosure of mounting plate		P
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur		P
	Equipment suitable for isolation		
	The leakage current shall be measured through each pole with the contacts in open position (< 0,5 mA)	1,1 times U_e= ___V	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
b)	**TEST SEQUENCE 2** **#11 CJX2i-65 Us:440V~ 50/60Hz**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		
	Operational performance capability (Clause 9.3.3.6)		
9.3.3.5	Making and breaking capacity		
	Conditions, make operations only.....:	Test at AC-3	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-3	
	Control supply voltage at 110% U_s for half the number of operation cycles and 85% U_s for the other half, for AC-3, AC-3e and AC-4,	484V for 25 times 373V for 25 times	P
	rated operational voltage Ue (V) …….. :	660/690V~	P
	rated operational current Ie (A) or power (kW) ....:	42A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 715V L2: 717V L3: 716V	P
	- test current (A) I/Ie = 10 .....:	L1: 432A L2: 433A L3: 431A	P
	- power factor/time constant .....:	L1: 0,47 L2: 0,48 L3: 0,49	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	60s	P
	- number of make operations .....:	50	P
	Behaviour and condition during and after the test:		
	- 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

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, make/break operations only.....:	Test at AC-3	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660/690V~	P
	rated operational current Ie (A) or power (kW) ....:	42A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 739V L2: 741V L3: 740V	P
	- test current (A) I/Ie = 8 .....:	L1: 341A L2: 343A L3: 342A	P
	- power factor/time constant .....:	L1: 0,43 L2: 0,42 L3: 0,42	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	40s	P
	- number of operations	☐ 50 make ☒ 50 make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	34,29kHz	P
	Measured oscillatory frequency (kHz) .....:	32,54kHz	P
	Factor y .....:	1,09	P
	Behaviour and condition during and after the test:		
	- 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
	For starters incorporated two contactors, 2 contactor shall be used with the following sequence: Close A – open A – close B – open B- off period		N/A
	Number of operation energized simultaneously		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.6	Operational performance capability:		
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660/690V~	P
	rated operational current Ie (A) or power (kW) ....:	42A	P
	Conditions, make/break operations:		P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 731V L2: 732V L3: 732V	P
	- test current (A) I/Ie = 2 .....:	L1: 84,2A L2: 84,9A L3: 85,0A	P
	- power factor/time constant .....:	L1: 0,46 L2: 0,46 L3: 0,46	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	10s	P
	- number of operations	☐ …… make ☒ …… make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	25,99kHz	P
	Measured oscillatory frequency (kHz) .....:	26,01kHz	P
	Factor y .....:	1,10	P
	Behaviour and condition during and after the test:		
	- 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
	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ui), min 1000 V for 60 s. (V) ..... :	Test voltage: 1380 V	P
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur.		P
	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) ..... :		N/A
	Leakage current: ≤ 2 mA /pole ..... :		N/A
	Equipment provided with mirror contacts		
	the mirror contact shall withstand its rated insulation voltage U_i. Ui (V)……..…:	Test voltage: _____ V	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
b)	**TEST SEQUENCE 2** **#12 CJX2i-65 Us:440V~ 50/60Hz**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		
	Operational performance capability (Clause 9.3.3.6)		
9.3.3.5	Making and breaking capacity		
	Conditions, make operations only.....:	Test at AC-4	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-4	
	Control supply voltage at 110% U_s for half the number of operation cycles and 85% U_s for the other half, for AC-3, AC-3e and AC-4,	484V for 25 times 373V for 25 times	P
	rated operational voltage Ue (V) …….. :	660/690V~	P
	rated operational current Ie (A) or power (kW) ....:	14A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 712V L2: 710V L3: 714V	P
	- test current (A) I/Ie = 12 .....:	L1: 169A L2: 171A L3: 170A	P
	- power factor/time constant .....:	L1: 0,43 L2: 0,45 L3: 0,44	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	20s	P
	- number of make operations .....:	50	P
	Behaviour and condition during and after the test:		
	- 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

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, make/break operations only.....:	Test at AC-4	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-4	
	rated operational voltage Ue (V) .....:	660/690V~	P
	rated operational current Ie (A) or power (kW) ....:	14A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 742V L2: 740V L3: 741V	P
	- test current (A) I/Ie = 10 .....:	L1: 144A L2: 143A L3: 143A	P
	- power factor/time constant .....:	L1: 0,46 L2: 0,44 L3: 0,45	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	20s	P
	- number of operations	☐ 50 make ☒ 50 make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	28,78kHz	P
	Measured oscillatory frequency (kHz) .....:	27,30kHz	P
	Factor y .....:	1,09	P
	Behaviour and condition during and after the test:		
	- 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
	For starters incorporated two contactors, 2 contactor shall be used with the following sequence: Close A – open A – close B – open B- off period		N/A
	Number of operation energized simultaneously		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.6	Operational performance capability:		
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-4	
	rated operational voltage Ue (V) .....:	660/690V~	P
	rated operational current Ie (A) or power (kW) ....:	14A	P
	Conditions, make/break operations:		P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 731V L2: 731V L3: 732V	P
	- test current (A) I/Ie = 6 .....:	L1: 84,5A L2: 84,6A L3: 85,0A	P
	- power factor/time constant .....:	L1: 0,46 L2: 0,46 L3: 0,46	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	10s	P
	- number of operations	☐ …… make ☒ …… make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	25,99kHz	P
	Measured oscillatory frequency (kHz) .....:	26,01kHz	P
	Factor y .....:	1,10	P
	Behaviour and condition during and after the test:		
	- 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
	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ui), min 1000 V for 60 s. (V) ..... :	Test voltage: 1380 V	P
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur.		P
	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) ..... :		N/A
	Leakage current: ≤ 2 mA /pole ..... :		N/A
	Equipment provided with mirror contacts		
	the mirror contact shall withstand its rated insulation voltage U_i. Ui (V)……..…:	Test voltage: _____ V	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
b)	**TEST SEQUENCE 2** **#13 CJX2i-65 Us:440V~ 50/60Hz**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		
	Operational performance capability (Clause 9.3.3.6)		
9.3.3.5	Making and breaking capacity		
	Conditions, make operations only.....:	Test at AC-3	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-3	
	Control supply voltage at 110% U_s for half the number of operation cycles and 85% U_s for the other half, for AC-3, AC-3e and AC-4,	484V for 25 times 373V for 25 times	P
	rated operational voltage Ue (V) …….. :	220/230/380/400V~	P
	rated operational current Ie (A) or power (kW) ....:	65A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 411V L2: 409V L3: 410V	P
	- test current (A) I/Ie = 10 .....:	L1: 669A L2: 668A L3: 667A	P
	- power factor/time constant .....:	L1: 0,46 L2: 0,45 L3: 0,45	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	80s	P
	- number of make operations .....:	50	P
	Behaviour and condition during and after the test:		
	- 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

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, make/break operations only.....:	Test at AC-3	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	220/230/380/400V~	P
	rated operational current Ie (A) or power (kW) ....:	65A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 437V L2: 439V L3: 438V	P
	- test current (A) I/Ie = 8 .....:	L1: 531A L2: 533A L3: 526A	P
	- power factor/time constant .....:	L1: 0,44 L2: 0,42 L3: 0,43	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	60s	P
	- number of operations	☐ 50 make ☒ 50 make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	57,88kHz	P
	Measured oscillatory frequency (kHz) .....:	54,03kHz	P
	Factor y .....:	1,08	P
	Behaviour and condition during and after the test:		
	- 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
	For starters incorporated two contactors, 2 contactor shall be used with the following sequence: Close A – open A – close B – open B- off period		N/A
	Number of operation energized simultaneously		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.6	Operational performance capability:		
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	220/230/380/400V~	P
	rated operational current Ie (A) or power (kW) ....:	65A	P
	Conditions, make/break operations:		P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 435V L2: 436V L3: 434V	P
	- test current (A) I/Ie = 2 .....:	L1: 136A L2: 137A L3: 138A	P
	- power factor/time constant .....:	L1: 0,43 L2: 0,42 L3: 0,44	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	20s	P
	- number of operations	☐ …… make ☒ …… make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	43,87kHz	P
	Measured oscillatory frequency (kHz) .....:	41,45kHz	P
	Factor y .....:	1,08	P
	Behaviour and condition during and after the test:		
	- 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
	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ui), min 1000 V for 60 s. (V) ..... :	Test voltage: 1380 V	P
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur.		P
	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) ..... :		N/A
	Leakage current: ≤ 2 mA /pole ..... :		N/A
	Equipment provided with mirror contacts		
	the mirror contact shall withstand its rated insulation voltage U_i. Ui (V)……..…:	Test voltage: _____ V	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
b)	**TEST SEQUENCE 2** **#14 CJX2i-65 Us:440V~ 50/60Hz**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		
	Operational performance capability (Clause 9.3.3.6)		
9.3.3.5	Making and breaking capacity		
	Conditions, make operations only.....:	Test at AC-4	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-4	
	Control supply voltage at 110% U_s for half the number of operation cycles and 85% U_s for the other half, for AC-3, AC-3e and AC-4,	484V for 25 times 373V for 25 times	P
	rated operational voltage Ue (V) …….. :	220/230/380/400V~	P
	rated operational current Ie (A) or power (kW) ....:	28A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 409V L2: 411V L3: 410V	P
	- test current (A) I/Ie = 10 .....:	L1: 342A L2: 340A L3: 343A	P
	- power factor/time constant .....:	L1: 0,43 L2: 0,44 L3: 0,43	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	40s	P
	- number of make operations .....:	50	P
	Behaviour and condition during and after the test:		
	- 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

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, make/break operations only.....:	Test at AC-4	
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-4	
	rated operational voltage Ue (V) .....:	220/230/380/400V~	P
	rated operational current Ie (A) or power (kW) ....:	28A	P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 434V L2: 432V L3: 433V	P
	- test current (A) I/Ie = 10 .....:	L1: 290A L2: 291A L3: 291A	P
	- power factor/time constant .....:	L1: 0,47 L2: 0,46 L3: 0,48	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	30s	P
	- number of operations	☐ 50 make ☒ 50 make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	51,15kHz	P
	Measured oscillatory frequency (kHz) .....:	48,37kHz	P
	Factor y .....:	1,09	P
	Behaviour and condition during and after the test:		
	- 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
	For starters incorporated two contactors, 2 contactor shall be used with the following sequence: Close A – open A – close B – open B- off period		N/A
	Number of operation energized simultaneously		N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.6	Operational performance capability:		
	Type of product .....:	CJX2i-65	
	utilization category .....:	AC-4	
	rated operational voltage Ue (V) .....:	220/230/380/400V~	P
	rated operational current Ie (A) or power (kW) ....:	28A	P
	Conditions, make/break operations:		P
	- test voltage (V) U/Ue = 1,05 .....:	L1: 431V L2: 433V L3: 432V	P
	- test current (A) I/Ie = 6 .....:	L1: 171A L2: 173A L3: 172A	P
	- power factor/time constant .....:	L1: 0,47 L2: 0,48 L3: 0,48	P
	- on-time (ms) .....:	50ms	P
	- off-time (s) .....:	20s	P
	- number of operations	☐ …… make ☒ …… make/ break	P
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) .....:	46,18kHz	P
	Measured oscillatory frequency (kHz) .....:	43,62kHz	P
	Factor y .....:	1,09	P
	Behaviour and condition during and after the test:		
	- 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
	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ui), min 1000 V for 60 s. (V) ..... :	Test voltage: 1380 V	P
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur.		P
	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) ..... :		N/A
	Leakage current: ≤ 2 mA /pole ..... :		N/A
	Equipment provided with mirror contacts		
	the mirror contact shall withstand its rated insulation voltage U_i. Ui (V)……..…:	Test voltage: _____ V	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
c)	**TEST SEQUENCE 3** **#15 CJX2i-65 Us:440V~ 50/60Hz**		
	- Performance under short-circuit conditions (Clause 9.3.4)		
9.3.4	Performance under short-circuit conditions		
	For MPSD	See Annex P	
	If devices tested in free air may also be used in an individual enclosure, they shall be additionally tested in the smallest of such enclosures stated by the manufacturer.		N/A
	For devices tested only in free air, information shall be provided to indicate that the device has not been evaluated for use in an individual enclosure.		P
	The individual enclosure shall be in accordance with the manufacturer specifications. In case of multiple enclosure options are provided, the individual enclosure with the smallest volume shall be taken		N/A
	Sub clause 9.3.4.1.1 of IEC 60947-1:2020 applies except that, for type “1” co-ordination, the fusible element F and resistor are replaced by a solid 6 mm^2 wire of 1,2 m to 1,8 m length connected to the neutral, or with the agreement of the manufacturer, to one of the phases	☒ neutral ☐ phase ____	P
	Maximum motor current Ie and maximum Ue are covered	690V, 65A	P
	Rated control supply voltage.....:	440V~	P
9.3.4.2.2	Test at the prospective current "r":		
	type of product.....:	CJX2i-65	P
	test circuit, figure 9, 10, 11, 12.....:	Figure 11	P
	type of SCPD .....:	RT16 gG 80 A	P
	ratings of SCPD, co-ordination type 1 .....:		N/A
	ratings of SCPD, co-ordination type 2 .....:	690V, 80A	P
	rated operational current Ie (A) AC-3 .....:	65A	P
	rated operational voltage (V).....:	690V~	P
	prospective current "r" (kA) (table 13 or 14).....:	5kA	P
	Wire size (mm^2) type 1	____ mm^2	N/A
	Wire size (mm^2) type 2	25 mm^2	P

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Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (V) .....:	L1: 750V L2: 747V L3: 752V	P
	r.m.s. test current (A) .....:	L1: 5080A L2: 5140A L3: 5150A	P
	peak current (A) .....:	L1: 7160A L2: 7330A L3: 7320A	P
	power factor	0,68	P
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I^2dt and Ip (A^2s / A) .....:	L1:6,06kA^2s/1,44kA L2:27,5kA^2s/3,83kA L3:28,2kA^2s/4,35kA	P
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I^2dt and Ip (A^2s / A)	L1:30,7kA^2s/4,05kA L2:10,4mA^2s/16,8A L3:30,8kA^2s/4,07kA	P
9.3.4.2.4	Behaviour of the equipment during the test		
	Both types of co-ordination (all devices):		
	A - the fault current has been successfully interrupted by the SCPD, the combination starter or the combination switching device 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. Degree of protection by the enclosure is not less than IP2X		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):		
	E – the circuit breaker or switch is capable of being opened manually by its operating means		N/A
	F - neither end of the SCPD is completely separated from its mounting means to an exposed conductive part		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	G - if a circuit breaker with rated ultimate short-circuit breaking capacity less than the rated conditional short-circuit current assigned to the combination starter, the combination switching device, the protected starter or the protected switching device is employed, the circuit breaker shall be tested to trip as follows:		N/A
	1) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current		N/A
	2) circuit breaker with overload relays or releases, at 250% of the rated current of the circuit breaker		N/A
	Type 1 co-ordination (all devices):		
	H - There has been no discharge of parts beyond the enclosure. Damage to the contactor and the overload relay is acceptable. The starter other than MPSD may be inoperative after each operation. The starter shall therefore be inspected and the contactor and/or the overload relay and the release of the circuit-breaker shall be reset if necessary and, in the case of fuse protection, all fuse-links shall be replaced.		N/A
	Type 1 co-ordination (combination and protected starters only):		
	I - The adequacy of insulation in according with 8.3.3.4.1, item 4), of part 1 is verified after each operation (at currents “r” and “Iq”) by a dielectric test on the complete unit under test (SCPD plus contactor/starter but before replacement of parts). The test voltage shall be applied to the incoming supply terminals, with the switch or circuit-breaker in open position, as follows:		N/A
	Dielectric verification test voltage (2 Ue) but not less than 1000V for 60 s (V).....:	Test voltage: _____ V	N/A
	- between each pole and all other poles connected to the frame of the starter		N/A
	- between all live parts of all poles connected together and the frame of the starter		N/A
	- between the terminals of the line side connected together and terminals of the other side connected together		N/A
	For equipment suitable for isolation, the leakage current shall be measured through each pole, with the contacts in open position, at test voltage of 1,1 Ue and shall not exceed 6 mA	Test voltage: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	N/A
	Type 2 co-ordination (all devices)		

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Clause	Requirement + Test	Result - Remark	Verdict
	J - no damage to the overload relay or other parts has occurred, except that welding of contactor or starter contacts other than MPSD contacts is permitted, if they are easily separated without significant deformation, but no replacement of parts is permitted during the test, except that , in case of fuse protection, all fuse shall be replaced.		P
	In the case of welded contact as described above, the functionally of the device shall be verified by carrying out 10 operations under the conditions of table 10 for the applicable utilization category.	Contacts welded ☐ yes ☒ no	P
	Operational performance capability (9.3.3.6):		
	Type of product :		N/A
	utilization category :		N/A
	rated operational voltage Ue (V) :		N/A
	rated operational current Ie (A) or power (kW) :		N/A
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,05 (V) :		N/A
	- test current (A) I/Ie = 6 :		N/A
	- power factor/time constant :		N/A
	- on-time (ms) :		N/A
	- off-time (s) :		N/A
	- number of make/break operations :	10	N/A
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) :		N/A
	Measured oscillatory frequency (kHz) :		N/A
	Factor y :		N/A
	Behaviour and condition during and after the test:		
	- 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
	K - The tripping of the overload relay shall be verified at a multiple of the current setting and shall conform to the published tripping characteristics, according to 5.7.5, both before and after the short-circuit test.	Test current:_____A Measured:_____s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	L - The adequacy of insulation in according with 8.3.3.4.1, item 4), of part 1 shall be verified by a dielectric test on the contactor , starter, the combination starter, the combination switching device , the protected starter or protected switching device as follows:		P
	Dielectric verification test voltage (2 Ue) for 60 s (V) but not less than 1000V :	Test voltage: 1380 V	P
	- between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		P
	- between each pole of the main circuit and the other poles connected together and to the enclosure ore mounting plate with the contacts in all normal positions of operation		P
	- between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit - the other circuits - the exposed conductive parts - the enclosure or mounting plate		P
	In case of combination starters, combination switching devices, protected starters and protecting switching devices, additional tests according to 8.3.3.4.1, item 3) of part 1 shall be made as follows:		N/A
	Dielectric verification test voltage according table 12A of part 1) for 60 s (V)		
	across the main poles of the device with the contacts of the switch or of the circuit- breaker open and the contacts of the starter closed	Test voltage: _____ V	N/A
	For equipment suitable for isolation, the leakage current shall be measured through each pole, with the contacts in the open position, at a test voltage of 1,1 Ue and shall not exceed 2 mA	Test voltage: _____ V L1: _____ mA L1: _____ mA L1: _____ mA	N/A
9.3.4.2.3	Test at the rated conditional short-circuit current "Iq"		
	Type of product .....:		N/A
	Test circuit, figure 9, 10, 11, 12.....:		N/A
	type of SCPD .....:		N/A
	ratings of SCPD, co-ordination type 1 .....:		N/A
	ratings of SCPD, co-ordination type 2 .....:		N/A
	rated operational current Ie (A) AC-3 .....:		N/A
	rated operational voltage (V)		N/A
	prospective current "Iq" (kA) .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Wire size (mm^2) type 1	____ mm^2	N/A
	Wire size (mm^2) type 2	____ mm^2	N/A
	test voltage (V) .....:	L1: L2: L3:	N/A
	r.m.s. test current (A) .....:	L1: L2: L3:	N/A
	peak current (A) .....:	L1: L2: L3:	N/A
	power factor		N/A
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I^2t and Ip (A^2s / A) .....:	L1: L2: L3:	N/A
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I^2t and Ip (A^2s / A) .....:	L1: L2: L3:	N/A
	3. one breaking operation of SCPD by closing the switching device on to the short-circuit I^2t and Ip (A^2s / A) .....:	L1: L2: L3:	N/A
	Behaviour of the equipment during the test		
	Both types of co-ordination (all devices):		
	A - the fault current has been successfully interrupted by the SCPD, the combination starter or the combination switching device and the fuse or fusible element, or solid connection between the enclosure and supply shall not have melted		N/A
	B - the door or cover of the enclosure has not been blown open and it is possible to open the door or cover. Degree of protection by the enclosure is not less than IP2X		N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals		N/A
	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		N/A
	Both types of co-ordination (combination starters and protected starters only):		

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Clause	Requirement + Test	Result - Remark	Verdict
	E – the circuit breaker or switch is capable of being opened manually by its operating means		N/A
	F - neither end of the SCPD is completely separated from its mounting means to an exposed conductive part		N/A
	G - if a circuit breaker with rated ultimate short-circuit breaking capacity less than the rated conditional short-circuit current assigned to the combination starter, the combination switching device, the protected starter or the protected switching device is employed, the circuit breaker shall be tested to trip as follows:		N/A
	1) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current		N/A
	2) circuit breaker with overload relays or releases, at 250% of the rated current of the circuit breaker		N/A
	Type 1 co-ordination (all devices):		
	H - There has been no discharge of parts beyond the enclosure. Damage to the contactor and the overload relay is acceptable. The starter other than MPSD may be inoperative after each operation. The starter shall therefore be inspected and the contactor and/or the overload relay and the release of the circuit-breaker shall be reset if necessary and, in the case of fuse protection, all fuse-links shall be replaced.		N/A
	Type 1 co-ordination (combination and protected starters only):		
	I - The adequacy of insulation in according with 8.3.3.4.1, item 4), of part 1 is verified after each operation (at currents “r” and “Iq”) by a dielectric test on the complete unit under test (SCPD plus contactor/starter but before replacement of parts). The test voltage shall be applied to the incoming supply terminals, with the switch or circuit-breaker in open position, as follows:		N/A
	Dielectric verification test voltage (2 Ue) but not less than 1000V for 60 s (V).....:	Test voltage: _____ V	N/A
	- between each pole and all other poles connected to the frame of the starter		N/A
	- between all live parts of all poles connected together and the frame of the starter		N/A
	- between the terminals of the line side connected together and terminals of the other side connected together		N/A
	For equipment suitable for isolation, the leakage current shall be measured through each pole, with the contacts in open position, at test voltage of 1,1 Ue and shall not exceed 6 mA	Test voltage: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Type 2 co-ordination (all devices)		
	J - no damage to the overload relay or other parts has occurred, except that welding of contactor or starter contacts other than MPSD contacts is permitted, if they are easily separated without significant deformation, but no replacement of parts is permitted during the test, except that , in case of fuse protection, all fuse shall be replaced.		N/A
	In the case of welded contact as described above, the functionally of the device shall be verified by carrying out 10 operations under the conditions of table 10 for the applicable utilization category.	Contacts welded ☐ yes ☐ no	N/A
	Operational performance capability (9.3.3.6):		
	Type of product :		N/A
	utilization category :		N/A
	rated operational voltage Ue (V) :		N/A
	rated operational current Ie (A) or power (kW) :		N/A
	Conditions, make/break operations:		N/A
	- test voltage U/Ue = 1,05 (V) :		N/A
	- test current (A) I/Ie = 6 :		N/A
	- power factor/time constant :		N/A
	- on-time (ms) :		N/A
	- off-time (s) :		N/A
	- number of make/break operations :	10	N/A
	Characteristic of transient recovery voltage for AC-2, AC-3, AC-3e, AC-4, AC-8a and AC-8b only:		
	oscillatory frequency (kHz) :		N/A
	Measured oscillatory frequency (kHz) :		N/A
	Factor y :		N/A
	Behaviour and condition during and after the test:		
	- no permanent arcing		N/A
	- no flash-over between poles		N/A
	- no blowing of the fusible element in the earth circuit		N/A
	- no welding of the contacts		N/A
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	K - The tripping of the overload relay shall be verified at a multiple of the current setting and shall conform to the published tripping characteristics, according to 5.7.5, both before and after the short-circuit test.	Test current:_____A Measured:_____s	N/A
	L - The adequacy of insulation in according with 8.3.3.4.1, item 4), of part 1 shall be verified by a dielectric test on the contactor , starter, the combination starter, the combination switching device , the protected starter or protected switching device as follows:		N/A
	Dielectric verification test voltage (2 Ue) for 60 s (V) but not less than 1000V :	Test voltage: _____ V	N/A
	- between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		N/A
	- between each pole of the main circuit and the other poles connected together and to the enclosure ore mounting plate with the contacts in all normal positions of operation		N/A
	- between each control and auxiliary circuit not normally connected to the main circuit and: - the main circuit - the other circuits - the exposed conductive parts - the enclosure or mounting plate		N/A
	In case of combination starters, combination switching devices, protected starters and protecting switching devices, additional tests according to 8.3.3.4.1, item 3) of part 1 shall be made as follows:		N/A
	Dielectric verification test voltage according table 12A of part 1) for 60 s (V)		N/A
	across the main poles of the device with the contacts of the switch or of the circuit- breaker open and the contacts of the starter closed	Test voltage: _____ V	N/A
	For equipment suitable for isolation, the leakage current shall be measured through each pole, with the contacts in the open position, at a test voltage of 1,1 Ue and shall not exceed 2 mA	Test voltage: _____ V L1: _____ mA L1: _____ mA L1: _____ mA	N/A
9.3.4.3	AC-3e co-ordination test procedure		
	Type of product .....:		
	utilization category .....:		
	rated operational voltage Ue (V) .....:		N/A
	rated operational current Ie (A) or power (kW) ....:		N/A
	Conditions, break operations:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- test voltage U/Ue = 1,05 (V) .....:		N/A
	- test current Icd (A) .....:		N/A
	- power factor/time constant .....:		N/A
	- on-time (ms) .....:		N/A
	- off-time (s) .....:		N/A
	- number of make/break operations .....:	3	N/A
	Characteristic of transient recovery voltage		
	oscillatory frequency (kHz) .....:		N/A
	Measured oscillatory frequency (kHz) .....:		N/A
	Factor y .....:		N/A
	Behaviour of contactors or starters during and after the I_{cd} test:		
	- no permanent arcing		N/A
	- no flash-over between poles		N/A
	- no blowing of the fusible element in the earth circuit		N/A
	- no welding of the contacts		N/A
	- the contacts shall operate correctly when the contactor or starter is switched by the applicable method of control		
	Dielectric verification		
	test voltage (2 Ue), min. 1000 V for 60 s. (V) ..... :	Test voltage: _____ V	N/A
	No flashover, breakdown of insulation either internally (puncture) or externally (tracking) or any other manifestation of disruptive discharge shall occur.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
d)	**TEST SEQUENCE 4** **#16 CJX2i-65 Us:440V~ 50/60Hz**		
	Overload current withstand capability of contactors and IMPSDs		
9.3.5	Verification of ability to withstand overload currents		
	Overload current withstand capability of contactors and IMPSDs, AC-3, AC-3e or AC-4		
	ambient temperature (°C) .....:	23°C	P
	rated operational current Ie (A) max. AC-3 or Ie (A) max. AC-3e .....:	65A	P
	test current (A) .....:	520A	P
	duration of test: 10 s .....:	10s	P
	After the test, the contactor shall be substantially in the same condition as before the test (visual inspection)		P

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**Compliance with performance requirements**		
e)	**TEST SEQUENCE 5** **#17 CJX2i-65 Us:440V~ 50/60Hz**		
	1) verification of mechanical properties of terminals according to 8.2.4 of IEC 60947-1:2020 Clause 9.2.2 and 9.2.3; **2) verification of degrees of protection of enclosed contactors and starters (see Annex C of IEC 60947-1:2020)**		
8.2.4 part 1	Verification of mechanical properties of terminals	(see 8.2.4 part 1 above)	P
Annex C Part 1	Verification of degrees of protection of enclosed contactors and starters	(see 8.2.3 part 1 above)	P

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Clause	Requirement + Test	Result - Remark	Verdict

9.4	**EMC**		
	Where a range of contactors or starters comprise similar control electronics, within similar frame sizes, it is only necessary to test a single representative sample of the contactor or starter as specified by the manufacturer.		N/A
	The test sample shall be operated with the rated control circuit supply voltage.		N/A
9.4.2	Immunity (for equipment incorporating electronic circuits)		
	Test levels of IEC60947-4-1: table 16 ..... : Special requirements are specified in clause 9.4.2.1 to 9.4.2.7		N/A
9.4.2.2	Performance of the test sample during and after the test		
	The product shall perform according to the performance criteria given in Table 12.		N/A
9.3.6.2	Operating limits		
8.2.1.2	Limits of operation of contactors and power-operated starters		
8.2.1.2 Part 1	Limits of operation of power operated equipment		
	rated control circuit supply voltage Us (V) .....:		N/A
	frequency (Hz) .....:		N/A
	rated air supply pressure ……..:		N/A
	ambient temperature ……:		N/A
	operation range……..:		N/A
	close at any value between 85% and 110% (V or bar).....:	_	N/A
	drop out voltage: 75% to 20% (or 10% if specified by manufacturer) for a.c. and 75% to 10% for d.c. (V) .....:		N/A
	drop out pressure (bar) 75% to 10% of rated pressure……..……:		N/A
	In the case of coils, the limiting drop-out values apply when the coil circuit resistance is equal to that obtained at –5 °C……:		N/A
	Calculated values……:		N/A
	Drop out time (if applicable)……..:		N/A
	For latched contactors, the device shall drop out and open fully when a de-latching voltage between 85 % and 110 % of the rated de-latching voltage is applied……..:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.4.2.3	Electrostatic discharge		
	Discharges shall be applied only to points which are accessible during normal usage.		N/A
	performance criterion B of Table 12.		N/A
9.4.2.4	Radiated radio-frequency electromagnetic field		
	performance criterion A of Table 12.		N/A
9.4.2.5	Conducted disturbances induced by radio-frequency fields		
	performance criterion A of Table 12.		N/A
9.4.2.6	Electrical fast transient/bursts		
	The contactor shall be operated at least one time during the test and the overload relay is loaded at 0,9 times the current setting with a maximum of 100 A.		N/A
	performance criterion B of Table 12.		N/A
9.4.2.7	Surges (1,2/50 µs – 8/20 µs)		
	performance criterion B of Table 12.		N/A
9.4.2.8	Power frequency magnetic fields		
	performance criterion A of Table 12.		N/A
9.4.2.9	Voltage dips and short-time interruptions		
	performance criterion C of Table 12.		N/A
	performance criterion B of Table 12.		N/A
	Contactors: general criteria of Table 12		N/A
9.4.2.10	Harmonics in the supply		
	For MPSD with electronic over-current release verification up to the fifth harmonic component at 50 % of the fundamental component:		N/A
	Method used……..:		N/A
	Unwanted tripping at 0,9 times the current setting for 10 times the tripping time……..:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.4.3	Emission		
9.4.3.2	Conducted radio-frequency emission tests		
	The test shall be conducted using the method of CISPR 11		N/A
	The emission shall not exceed the levels given in table 17		N/A
9.4.3.3	Radiated radio-frequency emission tests		
	The test shall be conducted using the method of CISPR 11		N/A
	The emission shall not exceed the levels given in table 18		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	TEST SEQUENCE Annex A		N/A
Annex A	**Marking and identification of terminals of contactors, starters and associated overload relays**		
	TEST SEQUENCE Annex B		N/A
	Special tests		
Annex B2	**Mechanical durability**		
	TEST SEQUENCE Annex F		N/A
	Requirements for auxiliary contact linked with power contact (mirror contact)		
	TEST SEQUENCE Annex H		N/A
	Extended functions to electronic overload relays		
	TEST SEQUENCE Annex K		N/A
	Procedure to determine data for electromechanical contactors used in functional safety applications.		
	TEST SEQUENCE Annex L		N/A
	Assessment procedure for electromechanical overload protection used in safety applications and especially in explosive atmospheres		
	TEST SEQUENCE Annex M		N/A
	DC contactors for use in photovoltaic (PV) applications		
	TEST SEQUENCE Annex N		N/A
	Additional requirements and tests for equipment with protective separation		
	TEST SEQUENCE Annex O		N/A
	Load monitoring indicators		
	TEST SEQUENCE Annex P		N/A
	Short-circuit breaking tests of MPSD		

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Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Heating Test **#1 CJX2i-65 Us:440V~ 50/60Hz**		
	Test voltage (V) ..... :	**--**	**—**
	Ambient (°C) ..... :	**22,6 °C**	**—**

Thermocouple Locations	**max. temperature measured, (K)**	**max. temperature limit, (K)**
Main circuit terminals	**56,9**	**65**
Enclosure	**28,6**	**40**
Auxiliary circuit terminals	**20,6**	**65**
Supplementary information: N/A		

	TABLE: Heating test, resistance method					
	Test voltage (V) :			**--**		**—**
	Ambient, t_1 (°C) :			**22,4**		**—**
	Ambient, t_2 (°C) :			**22,6**		**—**
Temperature rise of winding	**R_1 (Ω)**	**R_2 (Ω)**	**ΔT (K)**	**Max. dT (K)**	**Insulation class**	
#1 CJX2i-65 Us:440V~ 50/60Hz	**621**	**761**	**57,7**	**110**	**B**	
Supplementary information: N/A						

	TABLE: Dielectric Strength	
Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**
Between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation	**1890**	**No**
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	**1890**	**No**
Between each control and auxiliary circuit not normally connected to the main circuit and the main circuit	**1890**	**No**
Supplementary information: N/A		

	TABLE: insulation resistance measurements	**N/A**
Insulation resistance R between:	**R (MΩ)**	**Required R (MΩ)**
Between mains poles (primary fuse disconnected)		
Between parts separated by basic or supplementary insulation		
Between parts separated by double or reinforced insulation		
Supplementary information:		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Clearance And Creepage Distance Measurements					
clearance cl and creepage distance dcr at/of:	**Up (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**required dcr (mm)**	**dcr (mm)**
Opening contact (Main circuit)	**/**	**/**	**5,5**	**9,72**	**10**	**19,6**
Between phase (Main circuit)	**/**	**/**	**5,5**	**19,6**	**10**	**19,6**
Between live parts and other accessible parts (Main circuit)	**/**	**/**	**5,5**	**28,5**	**10**	**31,5**
Between live parts and mounting plate (Main circuit)	**/**	**/**	**5,5**	**24,8**	**10**	**24,8**
Opening contact (Auxiliary circuit)	**/**	**/**	**3**	**9,72**	**6,3**	**19,6**
Between live parts and other accessible parts (Auxiliary circuit)	**/**	**/**	**3**	**25,3**	**6,3**	**30,3**
Between live parts and mounting plate (Auxiliary circuit)	**/**	**/**	**3**	**24,8**	**6,3**	**24,8**
Supplementary information: N/A						

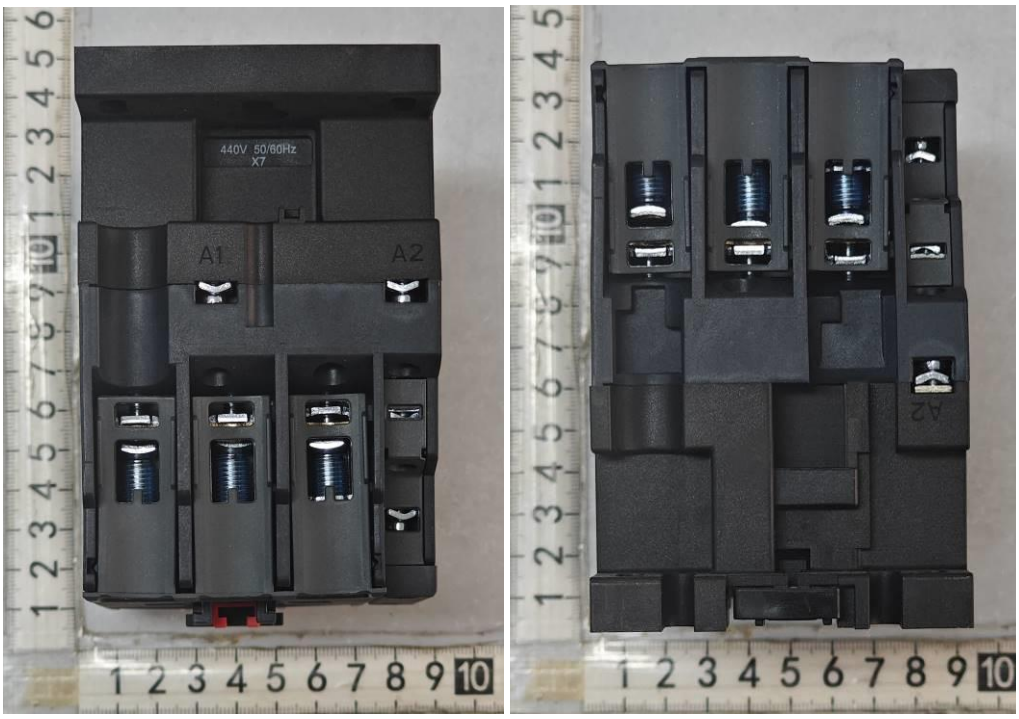
Photographs

CJX2i-65 Us:440V~ 50/60Hz

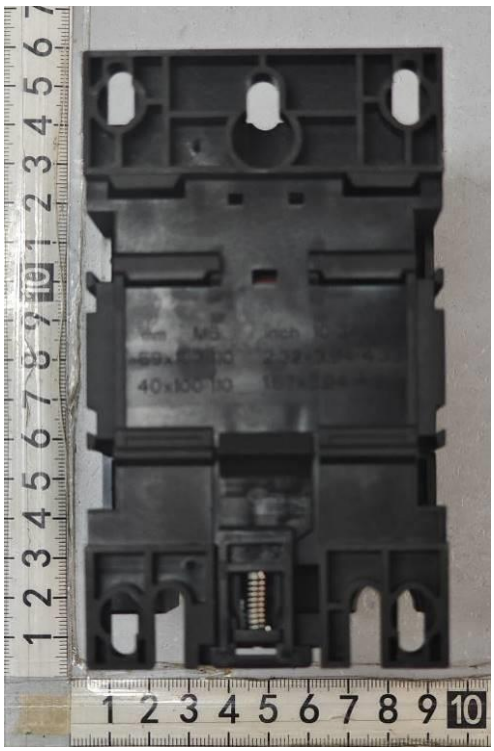
Over View

Side View

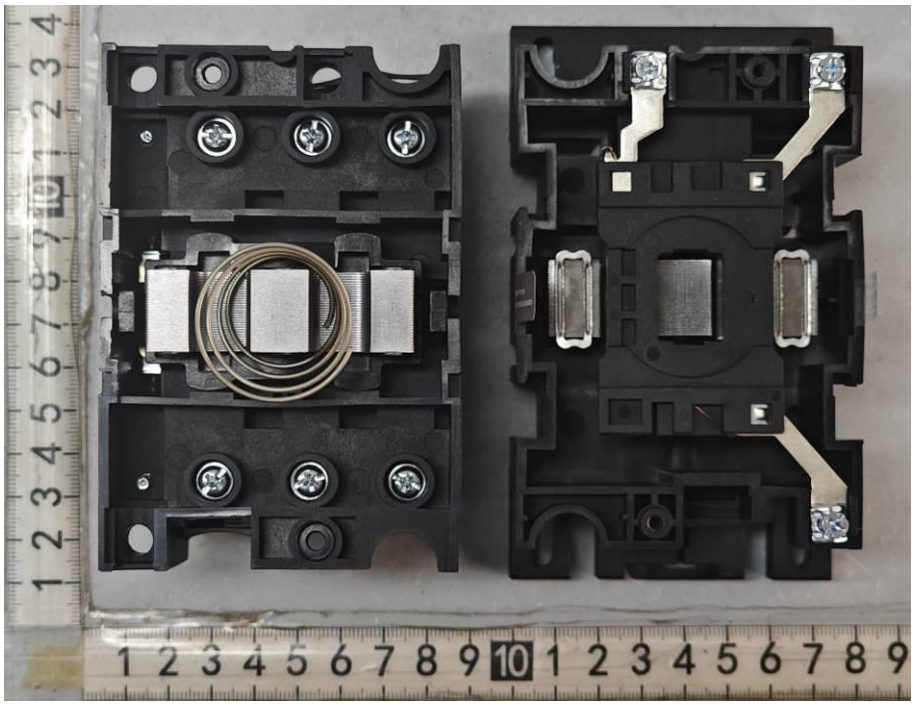
Side View



Side View



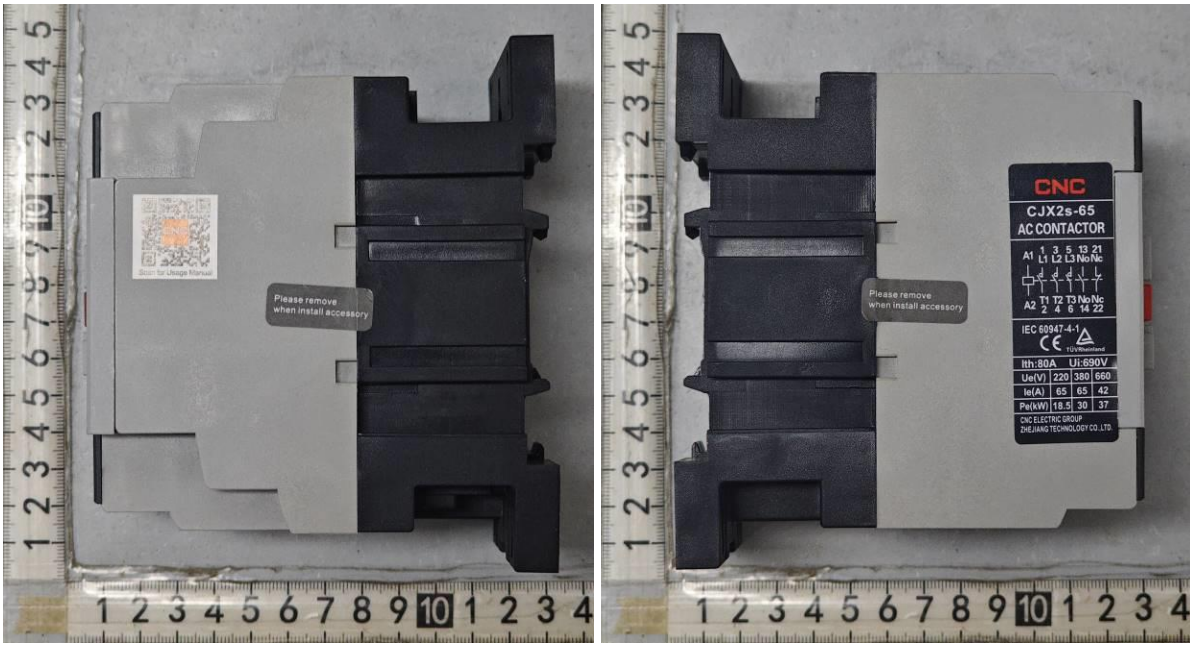
Inside View



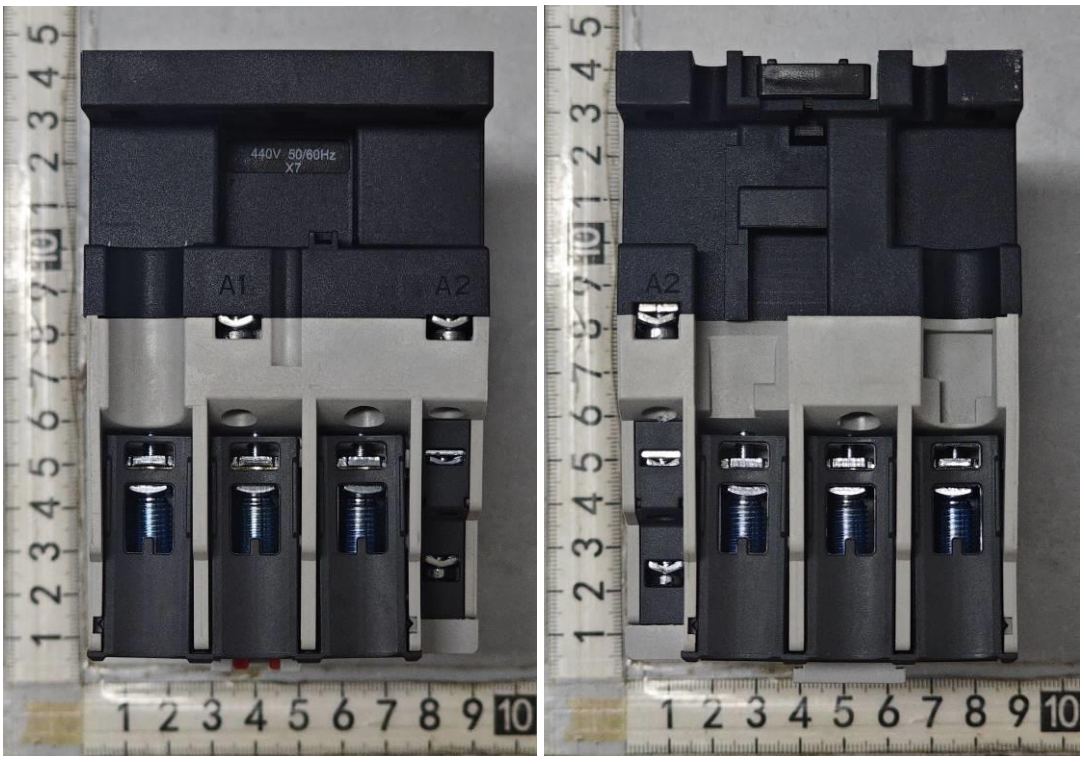
CJX2s-18 Us:440V~ 50/60Hz

Over View

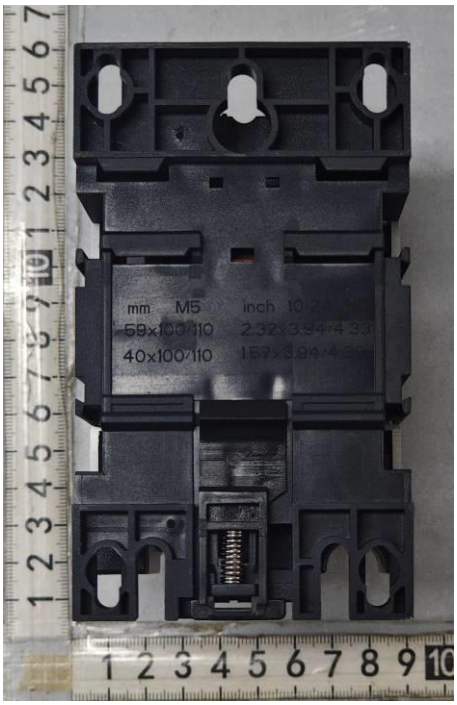
Side View



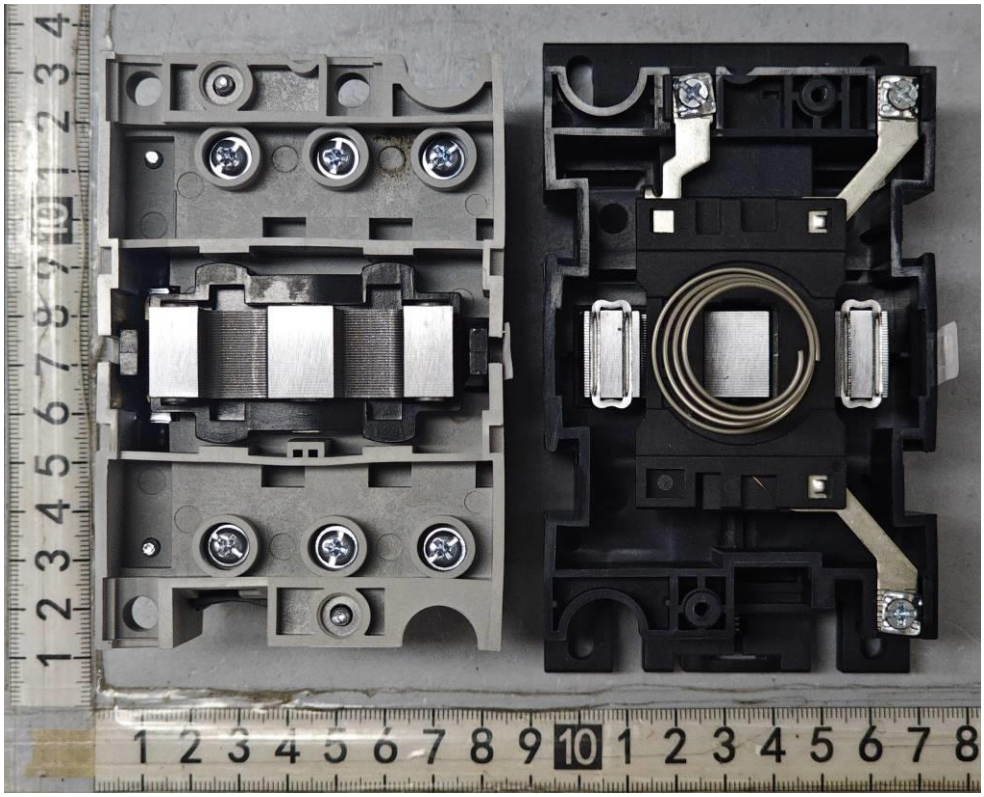
Side View



Side View



Inside View



Test Report issued under the responsibility of:

TEST REPORT
IEC 60947-5-1
Part 5: Control circuit devices and switching elements
Electromechanical control circuit devices

Report Number..... :	**B240164-02**
Date of issue ..... :	**2025-04-01**
Total number of pages ..... :	**74 pages**
Name of Testing Laboratory preparing the Report ..... :	**Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)**
Applicant's name..... :	**Zhejiang Changcheng Trading Co.,Ltd.**
Address ..... :	**No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province, China**
Test specification:	
Standard ..... :	IEC 60947-5-1:2024 to be used in conjunction with IEC 60947-1:2020
Test procedure..... :	CB Scheme
Non-standard test method..... :	N/A
TRF template used ..... :	IECEE OD-2020-F1:2023, Ed.1.6
Test Report Form No. ..... :	IEC60947_5_1I
Test Report Form(s) Originator.... :	DEKRA Certification B.V.
Master TRF ..... :	Dated 2024-07-15

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	AC Contactor
Trademark(s) ..... :	CNC
Manufacturer ..... :	CNC Electric Group Co., Ltd. No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province, China
Model/Type reference ..... :	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65
Ratings ..... :	See pages 10 to 14

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**	Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)	
Testing location/ address.....:		Inspection and Quarantine Mansion, jingang Avenue, Liushi, Yueqing, Wenzhou, Zhejiang, P.R.China	
Tested by (name, function, signature).....:		Gaoke Zheng - Testing engineer Lechen HU - Testing engineer (Reviewer)	Gaoke Zheng Lechen Hu
Approved by (name, function, signature)...:		Xiaomu Ye - Technical manager	Xiaomu Ye
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment): N/A

Summary of testing:

Standard used:

-IEC 60947-1:2020

-IEC 60947-4-1:2023

-IEC 60947-5-1:2024

-EN 60947-1:2007 + A1:2011 + A2:2014

-EN IEC 60947-4-1:2019

-EN 60947-5-1:2017

-This CB test report consists of 2 reports B240164-01 and B240164-02.

-All the samples are satisfied to the clauses examined.

-2 products of model CJX2i and CJX2s with 2 different colours of enclosures are applied.

-The 2 enclosures have the same structure and are made of the same material, only the colours are different. So, the type tests are performed on products of model CJX2i.

-The products have two groups of auxiliary contacts, 1 for NO and 1 for NC, the position of the auxiliary contact is marked on the plate NO or NC (See marking plate page 6 to 8).

-The main contacts are tested according to the standard IEC/EN 60947-4-1(See test report B240164-01).

-The product CJX2i-40, CJX2i-50, CJX2i-65 have the same function design and internal structure, only the marking plate are different.

Tests performed (name of test, test clause and date test performed):

IEC 60947-4-1 (See report B240164-01)

Type reference	Utilization category	Ue	Us	Tests sequence				
				1	2	3	4	5
CJX2i-65	AC-3	660/690V~	440V~	1	1	1	1	1
	AC-4	660/690V~	440V~	-	1	-	-	-
	AC-3	220/230/380/400V~	440V~	-	1	-	-	-
	AC-4	220/230/380/400V~	440V~	-	1	-	-	-
	AC-3	660/690V~	415V~	1*	-	-	-	-
	AC-3	660/690V~	380/400V~	1*	-	-	-	-
	AC-3	660/690V~	240V~	1*	-	-	-	-
	AC-3	660/690V~	220/230V~	1*	-	-	-	-
	AC-3	660/690V~	127V~	1*	-	-	-	-
	AC-3	660/690V~	110V~	1*	-	-	-	-
	AC-3	660/690V~	48V~	1*	-	-	-	-
	AC-3	660/690V~	36V~	1*	-	-	-	-
	AC-3	660/690V~	24V~	1*	-	-	-	-

*Only clause 9.3.3.2.1

IEC 60947-5-1 (See report B240164-02)

Type reference	Number of auxiliary contacts	Number of NC auxiliary contacts	Number of NO auxiliary contacts	Ue	Us	Tests sequence					
						I	II	III	IV	V	VI
CJX2i-65	2	1	1	380V~	440V~	1	-	-	1	1	1
				380V~	415V~	-	1	-	-	-	-
				220V~	380/400V~	-	1	-	-	-	-
				220V DC	240V~	-	1	-	-	-	-
				380V~	220/230V~	-	-	1	-	-	-
				220V~	127V~	-	-	1	-	-	-
				220V DC	110V~	-	-	1	-	-	-

Testing location:

Zhejiang Academy of Science and Technology for Inspection & Quarantine (Yueqing Branch)

Address: Inspection and Quarantine Mansion, jingang Avenue, Liushi, Yueqing, Wenzhou, Zhejiang, P.R.China

Summary of compliance with National Differences

- IECEE Member countries that are also CENELEC members
  Compliance with Group Differences evaluated ☐ **yes** ☐ **No** ☒ N/A

- IECEE Member countries with published National Differences which were evaluated:

- IECEE Member countries that did not publish any National Differences:

To support compliance with published National Differences, attach a compilation of relevant ND and/or GD TRFs to the CB Test Report

Use of uncertainty of measurement for decisions on conformity (decision rule):

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other: … (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.
Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

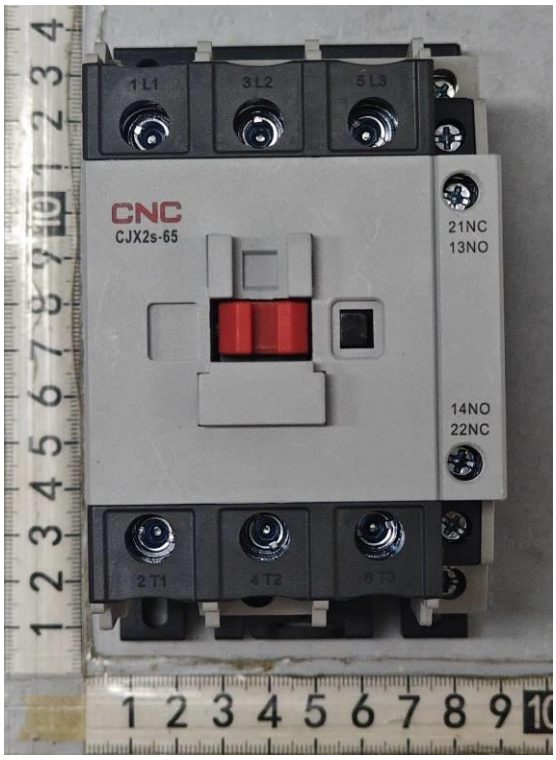
Copy of marking plate:

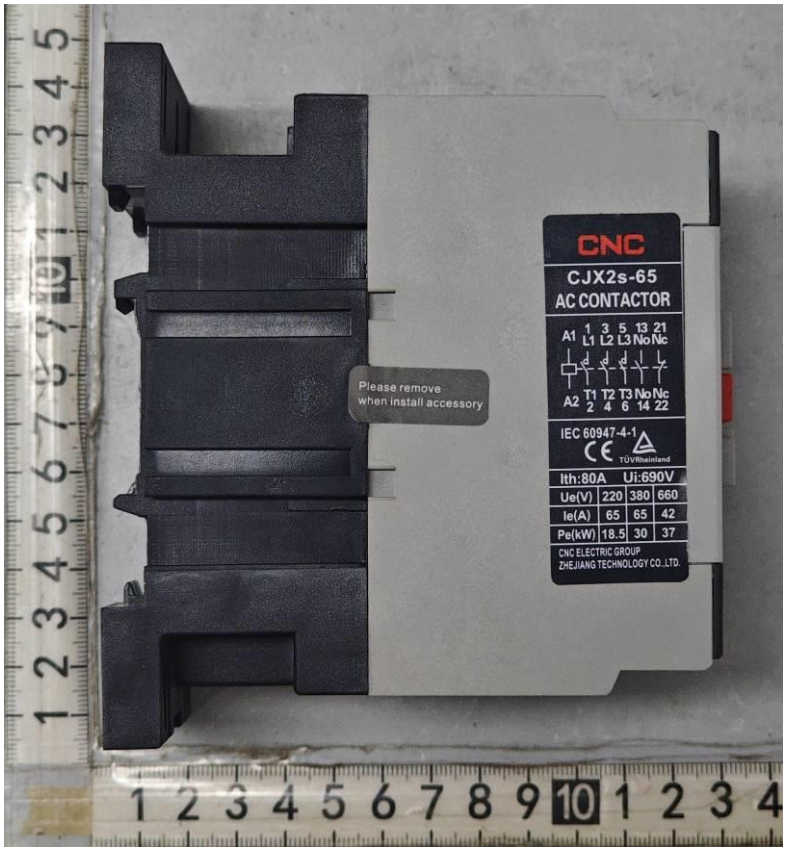
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

CJX2i-65

Copy of marking plate:

CJX2s-65





Test item particulars.....:	Auxiliary contacts of AC Contactor
Classification of installation and use .....:	On rail
Supply Connection.....:	Terminals for copper conductors
- Kind of control circuit device.....:	☐ manual control switches for example push-buttons, rotary switches, foot switches, etc.
	☒ electromagnetically operated control switches, either time delayed or instantaneous for example contactor relays
	☐ pilot switches for example pressure switches, temperature sensitive switches (thermostats), programmers, etc.
	☐ position switches
	☐ reed contact magnetic switches
	☐ associated control equipment for example indicator lights, etc.
- Kind of switching elements.....:	☒ auxiliary contacts of a switching device (e.g. contactor, circuit breaker) which are not dedicated exclusively for use with the coil of that device
	☐ interlocking contacts of enclosure doors
	☐ control circuit contacts of rotary switches
	☐ control circuit contacts of overload relays
- Number of poles .....:	
- Kind of current .....:	☒ ac and/or ☒ dc
- Interrupting medium.....:	☒ air, ☐ oil, ☐ gas, ☐ vacuum, ☐ ...
Operating conditions	
- Method of operations.....:	☐ manual
	☒ electromagnetic
	☐ pneumatic
	☐ electro-pneumatic
-Method of control.....:	☒ automatic
	☐ non-automatic
	☐ semi-automatic

Rated and limiting values for switching elements:	
Voltages:	
- rated operational voltage Ue (V) ..... :	380V~, 220V~, 220V DC
- rated insulation voltage Ui (V) ..... :	400V
- rated impulse withstand voltage Uimp (kV) ..... :	4kV
Currents:	
- conventional free air thermal current Ith (A) ..... :	10A
- conventional enclosed thermal current Ithe (A) ..... :	N/A
- rated operational current Ie (A) ..... :	0,95A at 380V~ 1,6A at 220V~ 0,15A at 220V DC
Rated frequency (Hz) ..... :	50/60Hz
Utilization category ..... :	AC-15 and DC-13
Short-circuit characteristic:	
- rated conditional short-circuit current (kA) ..... :	1kA
- kind of protective device ..... :	Fuse
Control circuits	
- type of current ..... :	AC
- rated frequency or direct current ..... :	50/60Hz
- rated control circuit voltage *Uc* ..... :	N/A
- rated control circuit supply voltage *Us* ..... :	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz
- limited energy ..... :	N/A
- SELV (PELV) supply ..... :	N/A
- power consumption ..... :	N/A
- power consumption of the electromagnet of a contactor relay, holding power ..... : pick-up power ..... :	24VA±30%(50Hz); 22VA±30%(60Hz) 220VA±30%(50Hz); 220VA±30%(60Hz)
Others	
Electrically separated contact elements ..... :	N/A
Actuating quantities for pilot switches ..... :	N/A
Pilot switches having two or more contact elements ... :	N/A
Indication of contact elements of same polarity ..... :	Yes
IP code, in case of an enclosed control device ..... :	IP20
Pollution degree ..... :	III
Suitability for isolation, with the symbol 07-13-06 of IEC 60617-7 ..... :	N/A
Electromagnetic compatibility (EMC) Environment A or B ..... :	N/A

Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2024-12
Date (s) of performance of tests.....:	2024-12-31 to 2025-02-27
General remarks:	
"(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.**	
Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies).....:	CNC Electric Group Co., Ltd. No. 66, Huachi Road, Yanjiang Industrial Area, BeiBaixiang Town, Yueqing City, Wenzhou City, 325603, Zhejiang Province, China

General product information and other remarks:

Main circuit:

3P

Ue: 220/230/380/400/660/690V~; 50/60Hz

Us: 440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz

Utilization category	Ue	Ie		
		CJX2i-40 / CJX2s-40	CJX2i-50 / CJX2s-50	CJX2i-65 / CJX2s-65
AC-3	660/690V~	34A	39A	42A
	220/230/380/400V~	40A	50A	65A
AC-4	660/690V~	9A	12A	14A
	220/230/380/400V~	18,5A	24A	28A

Ith: 50A(CJX2i-40 / CJX2s-40); 60A(CJX2i-50 / CJX2s-50); 80A(CJX2i-65 / CJX2s-65)

Ui= 690V Uimp=6kV

Pollution degree: 3

-Nominal diameter of thread for Main circuits terminals: M8 Tightening torque: 6 Nm

Minimum cross section(mm^2) / Number of conductors / Rigid –flexible: 2,5 mm^2 / 2 / Rigid and flexible

Maximum cross section(mm^2) / Number of conductors / Rigid –flexible: 25 mm^2 / 1 / Rigid and flexible

Distance for metal screen: Back:0mm Front:0mm; Top:45mm Botton:45mm; Left:0mm Right:0mm

Auxiliary circuit:

Utilization category	Ue	Ie
AC-15	380V~ 50/60Hz	0,95A
AC-15	220V~ 50/60Hz	1,6A
DC-13	220V DC	0,15A

Ith=10A

Ui: 400V Uimp=4kV

Pollution degree: 3

-Nominal diameter of thread for Auxiliary circuits terminals: M3.5 Tightening torque: 0,8 Nm

Minimum cross section(mm^2) / Number of conductors / Rigid –flexible: 0,5 mm^2 / 2 / Rigid and flexible

Maximum cross section(mm^2) / Number of conductors / Rigid –flexible: 1,5 mm^2 / 2 / Rigid and flexible

Distance for metal screen: Back:0mm Front:0mm; Top:45mm Botton:45mm; Left:0mm Right:0mm

Control circuit:

-Nominal diameter of thread for Auxiliary circuits terminals: M3.5 Tightening torque: 0,8 Nm

Minimum cross section(mm^2) / Number of conductors / Rigid –flexible: 0,5 mm^2 / 2 / Rigid and flexible

Maximum cross section(mm^2) / Number of conductors / Rigid –flexible: 1,5 mm^2 / 2 / Rigid and flexible

Distance for metal screen: Back:0mm Front:0mm; Top:45mm Botton:45mm; Left:0mm Right:0mm

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
6	**PRODUCT INFORMATION**		
6.2	**Marking**		
	Data is mandatory on the nameplate:		
	a - manufacturer's name or trademark ..... :		P
	b - type designation or serial number ..... :	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65	P
	u - indication of contact elements of same polarity, where applicable	Contact form Za	P
	Data shall be included on the nameplate, or on the control circuit device or in the manufacturer's documentation:		
	c - number of this standard ..... :	IEC 60947-5-1	P
	d - rated operational voltages ..... :	380V~, 220V~, 220V DC	P
	e - utilization category and rated operational currents, at the rated operational voltages of the control circuit device. If auxiliary contacts of a switching device are dedicated exclusively for use with that device or a series thereof the intended controlled load..... :	AC-15: 0,95A at 380V~ AC-15: 1,6A at 220V~ DC-13: 0,15A220V DC	P
	f - value of the rated frequency/frequencies (see 5.3.4), where applicable, for example: 50 Hz, 50 Hz/60 Hz, and/or the indication "DC" or the symbol (IEC 60417-5031:2002-10) ⎓ ..... :	50/60Hz DC	P
	i - rated insulation voltage: ..... :	400V	P
	j - rated impulse withstand voltage ..... :	4kV	P
	k - rated control circuit voltage U_C, nature of current and rated frequency, where applicable……:		N/A
	l - rated control circuit supply voltage U_S, nature of current and rated frequency, where applicable :	440V, 415V, 380/400V, 240V, 220/230V, 127V, 110V, 48V, 36V, 24V AC; 50/60Hz	P
	m - IP code ..... :	IP20	P
	n - pollution degree..... :	III	P
	o - type and maximum ratings of short-circuit protective device..... :	10A, 400V	P
	p - conditional short-circuit current..... :	1kA	P
	q - suitability for isolation, where applicable, with the symbol IEC 60617-S00288:2001-07 ..... :		N/A
	r - suitability for use with SELV/PELV circuit with the corresponding maximum rated operational voltage……..:		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
	s - length of insulation to be removed before insertion of the conductor into the terminal. ..... :		N/A
	The indication "s", "sol", "r" or "f" for non-universal screwless terminals shall be marked on the device or, if the space available is not sufficient, on the smallest package unit or in technical information provided with the product.……..:		N/A
	t - for non-universal screwless terminals: – “s” or "sol" for terminals declared for rigid-solid conductors; – "r" for terminals declared for rigid (solid and stranded) conductors; – "f" for terminals declared for flexible conductors.		N/A
	Data shall be provided:		
	g - actuating force (or torque), where applicable .... :		N/A
	h - recovery time, where applicable ..... :		N/A
	v - maximum number of contacts to be assembled within the control switch, where applicable..... :		N/A
	w - for light sources of the equipment, warning information depending on the expected optical radiation hazard, if any ..... :		N/A
	The following optional information can be provided:		
	y - material declaration according to IEC TS 63058:2021		N/A
6.2.1	Markings shall be indelible and easily legible and shall not be placed on screws and removable washers..... :		P
6.2.2	Terminal identification and marking (see 8.1.8.4 of IEC 60947-1:2020)		
	Clearly and permanently identified in accordance with IEC 60445 and Annex L, with additional requirements in annex M		P
	Neutral terminal identified by letter N..... :		N/A
	Protective earth terminal identified by  ..... :		N/A
6.2.3	Functional markings		
	Actuators may be identified by indelible symbols. If a stop-button carries any symbol on the actuator, it shall be a circle or an oval (signifying the value zero). The symbols circle or oval shall be used for stop-buttons only.		N/A
	Letters or words may be used where space is available		N/A
	Symbols shall be in accordance with IEC 60417		N/A
6.2.4	Emergency stop		

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Subclause 4.2 of IEC 60947-5-5:1997 and IEC 60947-5-5:1997/AMD2:2016 applies		N/A
6.2.5	Operating diagram		
6.2.5.1	General		
	As rotary switches may have multiplicity of contacts elements and a multiplicity of actuator positions, it necessary that the manufacturer indicates the relationship between the actuator positions and the associated contact elements position.		N/A
	The relationship shall be given in the form of an operating diagram.		N/A
6.2.5.2	Position indication and contact position		
	Sub clause 8.1.6.1 of IEC 60947-1:2020 applies	See clause 8.1.6.1	
	The position indication shall be clear, and the associated text or symbols shall be indelible and easily legible.		N/A
6.2.5.3	Terminal markings for operating diagrams		
	Terminal markings shall be clearly identifiable with respect to the operating diagram (see also Annex M)		N/A
6.2.6	Time delay markings		
	For time-delay contactor relays, the markings shall include the value of the time delay in the case of a fixed delay and the range of time delay in the case of an adjustable delay.		N/A
	In the case of more than one time-delay contact element, the relative delay between the operation of each contact element and the following one shall be indicated for contact elements that follow the first delay.		N/A
	If two or more contact elements have adjustable delays, it shall be indicated whether they are individually adjustable or not.		N/A
	The manufacturer shall indicate, for each time-delay contact element, the characteristics of the delay, according to 3.1.6.1 or 3.1.6.2		N/A
6.3	**Instructions for installation, operation and maintenance, decommissioning and dismantling**		
	Subclause 6.3 of IEC 60947-1:2020 applies		
	The manufacture shall specify, in his documents or catalogues:		
	- 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		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- equipment only suitable in environment A shall provided with the following notice ..... :	NOTICE This product has been designed for environment B may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures.	N/A
	- 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
	- Additional information for the decommissioning and dismantling of the equipment shall be made available to the user in case of foreseeable hazardous condition of the device, for example due to stored energy, instability or falling of objects, etc.		P
	These documents shall indicate the recommended extent and frequency of maintenance, if any		P
	For each relevant potential hazard, the manufacturer shall provide safety signs, graphical symbols or safety notes of the hazard, for example by using IEC 60417-5036 (2002-10). Signal words shall be defined according to ISO 3864-2		P
	Safety information and instructions shall be provided when relevant in order to achieve the safe use of the control circuit device. Such information shall be easily understood by the user, i.e. in form of commonly used symbols and/or drawings. Examples can be found in ISO 7000 and IEC 60417.		P
	Products within the scope of this document are intended to be selected, installed and maintained by skilled personnel only		P
6.4	**Environmental information**		
6.4.1	Environmentally conscious design process (ECD process)		
	Assistance in the consideration of environmental aspects relating to products in scope of this document is given in Clause 4 and Clause 5 of IEC TS 63058:2021		N/A
6.4.2	Procedure to establish material declaration		
	Providing the material declaration is at discretion of the manufacturer. When provided, Clause 7 of IEC TS 63058:2021 specifies content of the material declaration		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.5	Additional information		
	- class II control circuit devices, see F.6.2		N/A
	- semiconductor switching elements for control circuit devices, see Clause H.6		N/A
	- indicator lights, indicating towers and audible signalling devices, see Clause J.6		N/A
	- control switches with direct opening action, see Clause K.6		N/A
	- mechanically linked contact elements, see Clause L.6		N/A
	- reliability data, see Clause N.4		N/A
	- interface specific information, see Clause O.6		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7	**NORMAL SERVICE, MOUNTING AND TRANSPORT CONDITIONS**		
7.1	**Normal service conditions**		
7.1.1	Ambient temperature		
	Ambient air temperature does not exceed +40 °C and its average over 24 hours does not exceed +35°C and the lower limit is –5°C		P
7.1.2	Altitude		
	Altitude of site of installation does not exceed 2000 m		P
7.1.3	Atmospheric conditions		
7.1.3.1	Relative humidity does not exceed 50 % at max temp +40 °C, higher rel. hum may at lower temperatures e.g. 90% at +20 °C		P
7.1.3.2	Pollution degree		
	Unless otherwise stated by the manufacturer, a control circuit device is intended for installation under environmental conditions of pollution degree 3. However, other pollution degrees may apply, depending upon the micro-environment. :		P
7.1.4	Shock and vibration		
	Standard conditions of shock and vibration of Table Q.1 of IEC 60947-1:2020 apply unless otherwise stated in this document.		P
7.2	**Conditions during transport and storage**		
	Unless otherwise specified, the following temperature range applies during transport and storage: between –25 °C and +55 °C and, for short periods not exceeding 24 h, up to +70 °C		P
7.3	**Mounting**		
7.3.1	According to manufacturer’s instruction		P
7.3.2	Mounting of single hole mounted devices		
7.3.2.1	Dimensions		N/A
	The single hole mounted push-buttons and indicator lights are located in a circular hole of a panel (e.g. of a control station or a machine) or an enclosure, which may have a rectangular recess for a key.		N/A
	Dimensions according to Table 4 and in Figure 5		N/A
7.3.2.2	Location of key recess (if any)		
	The standardized position of the key is in the up position (12 o'clock) and associated with the *b* dimension in Table 4.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.3.2.3	Range of panel thickness		
	The device, with or without the sealing gasket indicated by the manufacturer, shall be capable of being mounted on any thickness of panel between 1 mm and 6 mm, if necessary by the use of packing piece(s) supplied for the purpose.		N/A
7.3.2.4	Grouping of devices		
	When a number of devices of the sizes given in 7.3.2.1 are mounted in rows on a panel, the distances a between the mounting centres in the same row and b between the centre lines of the rows shall be not less than those given in Table 5, unless otherwise stated by the manufacturer.		N/A
	Distances a and b may be interchanged		N/A
	These values are intended to guide development; however, when it is intended to mount devices of different manufacture, the user shall establish the compatibility of the devices and ensure the clearances and creepage distances are maintained when the devices are installed and connected.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8	**CONSTRUCTIONAL AND PERFORMANCE REQUIREMENTS**		
8.1	**Constructional requirements**		
8.1.1	General		
	Subclause 8.1.1 of IEC 60947-1:2020 applies.		P
8.1.2	Materials		
	The manufacturer shall specify which test method, 8.1.2.2 or 8.1.2.3, is to be used.		P
8.1.2.2	Glow-wire testing		
	If an identical material having representative cross-sections has already satisfied the requirements of any of the tests of 9.2.2 of IEC 60947-1:2020, then those tests need not be repeated.		P
	For parts with a mass lower than 2 g and for small parts, as specified in IEC 60695-2-11, test is not required		N/A
	For products containing a plurality of parts with a mass lower than 2 g and/or small parts, the amount of non-tested material located in direct proximity shall not exceed 10 g, test is not required		N/A
	The suitability of materials used is verified by:		P
	a) making tests on the equipment; b) making tests on sections taken from the equipment; c) making tests on any parts of identical material having representative thickness; d) providing data from the insulating material supplier fulfilling the requirements according to IEC 60695-2-12. ..... :	☒ a) ☐ b) ☐ c) ☐ d)	P
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11		
	Parts made of insulating material necessary to retain current-carrying parts in position:		
	-Part which retain current-carrying parts in position: 750 °C.	See Table	P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		P
	-All other parts: 650 °C.	See table	P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		P
8.1.2.3	Test based on flammability category		

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Clause	Requirement + Test	Result - Remark	Verdict
	Subclause 8.1.2.3 of IEC 60947-1:2020 applies		
	For parts of insulating materials, hot wire ignition and, where applicable, arc ignition tests as specified in 9.2.2.2 of IEC 60947-1: 2020, shall be made based on flammability category	See Table	P
	Tests on materials are made in accordance with Annex M of IEC 60947-1: 2020		P
	The hot wire ignition (HWI) and arc ignition (AI) test value requirements related to the material flammability category shall conform to Table M.1 or M.2		P
	Alternatively, the manufacturer may provide data from the insulating material supplier fulfilling the requirements given in Annex M		N/A
8.1.3	Current-carrying parts and their connection		
	Subclause 8.1.3 of IEC 60947-1:2020 applies		
	Current-carrying parts have the necessary mechanical strength and current-carrying capacity for their intended use		P
	For electrical connections, no contact pressure is transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless there is sufficient resiliency in the metallic parts to compensate for any possible shrinkage or yielding of the insulation material		P
	Compliance shall be verified by inspection and by conducting the test sequences of this standard.		P
8.1.4	Clearances and creepage distances		
	Subclause 8.1.4 of IEC 60947-1:2020 applies		
	Clearances distances:		
	Rated impulse withstand voltage ..... :	4kV	
	Pollution degree..... :	III	
	Inhomogeneous field or Homogeneous field ideal conditions (case A or case B) ..... :	Case A	
	Minimum clearance (mm) ..... :	3 mm	
	Measured clearances (mm) ..... :	See table	P
	Creepage distances		
	Pollution degree ..... :	III	
	Comparative tracking index (V) ..... :	175V	
	Material group ..... :	IIIa	
	Rated insulation voltage Ui (V) ..... :	400	

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Clause	Requirement + Test	Result - Remark	Verdict
	Minimum creepage distances (mm) ..... :	6,3	
	Measured creepage distances (mm) ..... :	See table	P
8.1.5	Actuator		
8.1.5.1	Insulation		
	Clause 8.1.5.1 of IEC 60947-1:2020 applies		
	Actuator insulated from live parts for		N/A
	- rated insulation voltage		N/A
	- rated impulse withstand voltage		N/A
	Actuator made of metal		N/A
	- connected to a protective conductor or provided with an additional insulation		N/A
	Actuator made of or covered by insulating material . :		N/A
	- internal metal parts, which might become accessible in the event of an insulation failure, are also insulated from live parts for the rated insulation voltage		N/A
8.1.5.2	Direction of movement		
	Clause 8.1.5.2 of IEC 60947-1:2020 applies		
	The direction of operation for actuators shall where applicable conform to IEC 60447		N/A
	There is no doubt of the “I” and “O” position and the direction of operation		N/A
8.1.5.3	Actuating force (or torque)		
	The force (or torque) required to operate the actuator, which is given by the manufacturer, shall be compatible with the intended application, taking into account the size of the actuator, the type of control station enclosure or panel, the environment of the installation and the use for which it is intended. ..... :		N/A
8.1.5.4	Limitation of rotation (of rotary switch)		
	When actuators with limited or unidirectional movement are used, they shall be fitted with robust means of limitation, capable of withstanding five times the actual maximum actuating torque, which is given by the manufacturer ..... :		N/A
8.1.5.5	Emergency stop		
	For actuating requirements on emergency stop devices with mechanical latching function, see IEC 60947-5-5		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.6	Indication of the contact position		
	Clause 8.1.6 of IEC 60947-1:2020 applies		
8.1.6.1	Indicating means		
	When an equipment is provided with means for indicating the closed and open positions, these positions shall be unambiguous and clearly indicated		N/A
	This is done by means of a position indicating device (see 3.5.18)		N/A
	If symbols are used, they shall indicate the closed and open positions respectively, in accordance with IEC 60417:		
	IEC 60417-5007 (2002-10) I On (power) ..... :		N/A
	IEC 60417-5007 (2002-10) O Off (power) ..... :		N/A
	For equipment operated by means of two push-buttons, only the push-button designated for the opening operation shall be red or marked with the symbol "O".		N/A
	Red colour shall not be used for any other push-button.		N/A
	The colours of other push-buttons, illuminated push-buttons and indicator lights shall be in accordance with IEC 60073.		N/A
8.1.6.2	Indication by the actuator		
	When the actuator is used to indicate the position of the contacts, it shall automatically take up or stay, when released, in the position corresponding to that of the moving contacts; in this case, the actuator shall have two distinct rest positions corresponding to those of the moving contacts, but for automatic opening a third distinct position of the actuator may be provided.		N/A
8.1.7	Conditions for control switches suitable for isolation		
	A control switch suitable for isolation shall be manually operated with a direct opening action (see Annex K) and shall comply with the isolating function in the open position (see 3.1.2.3 of this document and 8.1.7 of IEC 60947-1:2020)		N/A
	The open position of a control switch suitable for isolation shall be a position in which the switch can remain when no actuating force is applied.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	In order to avoid unintentional reclosing, it shall be possible to prevent the operation of the control switches suitable for isolation when the contact elements are in the open position. This may be obtained by padlocking or by a latch which shall only be releasable by a special tool or key.		N/A
8.1.8	Terminals		
	Subclause 8.1.8 of IEC 60947-1:2020 applies	See clause 9.2.5	
8.1.8.1	Constructional requirements		
	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength.		P
	Terminal connections shall be such that the force to connect the conductors may be applied by screws, screwless-type or other equivalent means so as to ensure that the necessary contact pressure is maintained.		P
	Terminals shall be so constructed that the conductors can be clamped between suitable surfaces without any significant damage either to conductors or terminals.		P
	Terminals shall not allow the conductors to be displaced or be displaced themselves in a manner detrimental to the operation of equipment and the insulation voltage shall not be reduced below the rated values.		P
	If required by the application, terminals and conductors may be connected by means of cable lugs for copper conductors only (see Table P.1).		N/A
	Screwless-type clamping units, unless otherwise specified by the manufacturer, shall accept solid, stranded and flexible conductors as indicated in Table 1.		N/A
	On screwless-type clamping unit, the connection or disconnection of conductors shall be made as follows:		
	– on universal clamping units by the use of a general purpose tool or a convenient device, integral with the clamping unit to open it for the insertion or withdrawal of the conductors		N/A
	– on push-wire clamping units by simple insertion. For the disconnection of the conductors an operation other than a pull only on the conductor shall be necessary. The use of a general purpose tool or of a convenient device, integral with the clamping unit is allowed in order to "open" it and to assist the insertion or the withdrawal of the conductor		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.8.2	Connecting capacity		
	Type of conductors:	Copper conductors	P
	Minimum cross-sectional area of conductor ..... :	0,5 mm²	P
	Maximum cross-sectional area of conductor ..... :	1,5 mm²	P
	Number of conductors simultaneously connectable to the terminal ..... :	2	P
8.1.8.3	Connection		
	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 although they may hold the terminals in place or prevent them from turning.		P
8.1.8.4	Terminal identification and marking		
	Terminals intended exclusively for the neutral conductor shall be identified by the letter "N" ..... :		N/A
	The protective earth terminal shall be identified in accordance with 8.1.10.3. ..... :		N/A
	Other terminals ..... :		N/A
8.1.10	Provisions for protective earthing		
	Clause 8.1.10 of IEC 60947-1:2020 applies		
	With the addition: Class II control circuit devices shall not be provided with a means for protective earthing (see IEC 61140)		N/A
8.1.10.1	Constructional requirements		
	The exposed conductive parts (e.g. chassis, heat sink, framework and fixed parts of metal enclosures) other than those which cannot constitute a danger shall be electrically interconnected and connected to a protective earth terminal for connection to an protective earthing conductor.		P
	This requirement can be met by the normal structural parts providing adequate electrical continuity and applies whether the equipment is used on its own or incorporated in an assembly.		P
	Exposed conductive parts are considered not to constitute a danger if they cannot be touched on large areas or grasped with the hand or if they are of small size (approximately 50 mm × 50 mm) or are so located as to exclude any contact with live parts.		P
8.1.10.2	Protective earth terminal		

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Clause	Requirement + Test	Result - Remark	Verdict
	The protective earth terminal shall be readily accessible and so placed that the connection of the equipment to the protective earthing conductor is maintained when the cover or any other removable part is removed.		N/A
	The protective earth terminal shall be suitably protected against corrosion		N/A
	In the case of equipment with conductive structures, enclosures, etc., means shall be provided, if necessary, to ensure electrical continuity between the exposed conductive parts the equipment and the metal sheathing of connecting conductors		N/A
	The protective earth terminal shall have no other function, except when it is intended to be connected to a PEN conductor (see 3.3.29), PEM conductor (see 3.3.28) or PEL conductor (see 3.3.30). In this case, it shall also have the function of a neutral terminal, mid terminal or earthed line terminal in addition to meeting the requirements applicable to the protective earth terminal.		N/A
8.1.10.3	Protective earth terminal marking and identification		
	The identification shall be achieved by colour (green-yellow mark) or by the notation PE, PEN, PEM or PEL, as applicable, in accordance with 7.3 of IEC 60445:2017, or by a graphical symbol for use on equipment.		N/A
	The graphical symbol to be used is the symbol 60417-5019 (2006-08) ⏚ Protective earth (ground) in accordance with the IEC 60417 database.		N/A
8.1.10.4	Protective earth continuity		
	All exposed conductive parts of the equipment and/or its enclosure connected to the terminal for the incoming external protective conductor.		N/A
	The resistance of the circuit from the exposed conductive part to the protective earth terminal shall not exceed 0,1 Ω.		N/A
8.1.11	Enclosures for equipment		
	Clause 8.1.11 of IEC 60947-1:2020 applies		
8.1.11.1	Design		
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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.		N/A
	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.		N/A
	The removable parts of the enclosure shall be firmly secured to the fixed parts by a device so 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
	An integral enclosure is considered to be a non-removable part.		N/A
	If the enclosure is used for mounting push-buttons, removal of buttons should be from the inside of the enclosure. Removal from the outside shall only be by use of a tool intended for this purpose.		N/A
8.1.11.2	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 is securely fixed to the enclosure		N/A
8.1.12	Degree of protection of enclosed equipment		
	Subclause 8.1.12 of IEC 60947-1:2020 applies		
	Degree of protection ..... :	IP20	
	Test for first characteristic		
	Test for first numeral ..... :	☐ 1: ☒ 2: ☐ 3: ☐ 4: ☐ 5: ☐ 6:	P
	Test for second characteristic		

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Clause	Requirement + Test	Result - Remark	Verdict
	Test for second numeral ..... :	☐ 1: ☐ 2: ☐ 3: ☐ 4: ☐ 5: ☐ 6: ☐ 7: ☐ 8:	N/A
8.1.13	Conduit pull-out, torque and bending with metallic conduits		
	Subclause 8.1.13 of IEC 60947-1:2020 applies		
	Polymeric enclosures of equipment, whether integral or not, provided with threaded conduit entries, intended for the connection of extra heavy duty, rigid threaded metal conduits complying with IEC 60981, shall withstand the stresses occurring during its installation such as pull-out, torque, bending.		P
	Compliance verified by the test of 9.2.8.		P
8.1.14	Requirements for control circuit devices with artificial optical radiation		
	Equipment with a lamp or lamp system emitting ultraviolet, visible, or infrared radiation, including light emitting diodes, shall not permit unintentional escape of radiation that could cause a hazard. The radiation sources shall be assessed in accordance with IEC 62471.		N/A
	Protective measures, restrictions on use and operating instructions that may be necessary shall be provided		N/A
8.1.15	Biological and chemical effects		
	Special applications that go beyond the normal service conditions given by Clause 7 of this document may require further considerations about biological and chemical effects. Necessary precaution shall be given to verify that the product is suitable for the application.		N/A
8.1.16	Hygienic design		
	Where equipment is intended for use in applications in which hygiene conditions are required, ISO 14159 may be considered for design and verification		N/A
8.1.17	Security aspects		

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Clause	Requirement + Test	Result - Remark	Verdict
	The integrity and the availability of the main functions of control circuit devices may depend on physical security and cybersecurity aspects. Based on a security risk assessment, security measures shall be developed, where relevant		N/A
8.1.18	Limited energy source		
8.1.18.1	A limited energy source can be implemented as a secondary circuit derived from circuits connected to the hazardous-live-part with the following means of separation:		N/A
	a - galvanic separation		N/A
	b - current limiting impedance		N/A
8.1.18.2	Limited energy source with galvanic separation		N/A
	A limited energy source with galvanic separation incorporates an isolating component such as a transformer between the primary circuit and the limited energy output. It complies with one of the following requirements:		N/A
	a - the output is inherently limited in compliance with Table 7; or		N/A
	b - a linear or non-linear impedance limits the output in compliance with Table 7. If a positive temperature coefficient device (e.g. a PTC thermistor) is used, it shall pass the applicable tests specified in IEC 60730-1; or		N/A
	c - a regulating network limits the output in compliance with Table 7, both with and without a single fault in the regulating network; or		N/A
	d - an overcurrent protective device is used and the output is limited in compliance with Table 8.		N/A
	Where an overcurrent protective device is used, it shall be a fuse or non-adjustable electromechanical device (e.g. circuit breaker)		N/A
	Compliance to determine the maximum available power by test of 9.2.10.		N/A
8.1.18.3	Limited energy source with current limiting impedance		
	A limited energy source with current limiting impedance has the following characteristics:		N/A
	a - the output voltage is limited in compliance with Table 9, and		N/A
	b - a linear or non-linear impedance limits the output in compliance with Table 9, both with and without a single fault.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	A limited energy source with current limiting impedance may be derived from either mains or from a galvanically separated circuit for example the secondary circuit of a transformer		N/A
8.1.19	Fault and abnormal conditions		
	The equipment shall be designed to avoid operating modes or sequences that can cause a fault condition or component failure leading to a hazard, unless other measures to prevent the hazard are provided by the installation and are described in the installation information provided with the equipment.		P
	Circuit analysis or testing shall be performed and include situations where a failure of the component or the insulation (basic and supplementary) would result in:		P
	– an impact on the risk of electric shock;		P
	– a risk of degradation resulting in emission of flame, burning particles or molten metal		P
	The analysis or testing shall include the effect of short-circuit and open-circuit conditions of the component. Testing is necessary unless analysis can conclusively show that no hazard will result from failure of the component, Compliance is checked by test of 9.2.11		P
	Components evaluated for their reliability according to relevant product standards are considered to meet these requirements and do not need any further investigation, if tested under the conditions for which the equipment is designed		P
8.1.20	Stored charge energy circuit		
	Parts including stored charge (capacitors) that are accessible (such as coil terminals) or removable for servicing (such as coil replacement), installation, or disconnection shall not present a risk of electric shock or arc flash hazard		N/A
	Capacitors connected to accessible hazardous live parts shall be discharged to an energy level less than 0,5 mJ within 5 s after the removal of power. Otherwise, a readily visible warning notice shall be provided on the product, indicating the time of discharge to the limit values or an appropriate method to discharge the capacitor before touching the connecting parts		N/A
8.1.21	Embedded software		

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Clause	Requirement + Test	Result - Remark	Verdict
	For information and minimum requirements related to embedded software supporting the main functions of control circuit devices, IEC TR 63201 gives guidance		N/A
8.2	**Performance requirements**		
8.2.1	Operating conditions		
	Subclause 8.2.1.1 of IEC 60947-1:2020 applies		
8.2.1.2	Limits of operation of contactor relays		
	The limits of operation for contactor relays shall be in accordance with 8.2.1.2 of IEC 60947-1:2020 ..... :	See clause 9.3.3.2	P
8.2.2	Temperature-rise		
	Subclause 8.2.2 of IEC 60947-1:2020 applies..... :	See clause 9.3.3.3	P
8.2.3	Dielectric properties		
	Subclause 8.2.3 of IEC 60947-1:2020 applies..... :	See clause 9.3.3.4	P
	For class II control circuit devices insulated by encapsulation..... :	See Annex F	N/A
8.2.4	Ability to make and break under normal and abnormal load conditions		
8.2.4.1	Making and breaking capacities		
	Making and breaking capacities under normal conditions as state in table 2..... :	See clause 9.3.3.5.3	P
	Making and breaking capacities under abnormal conditions as state in table 3..... :	See clause 9.3.3.5.4	P
8.2.4.3	Durability		
	Sub-clause 8.2.4.3 of IEC 60947-1:2020 applies with the following additions:		
	Mechanical durability..... :	See Annex C	N/A
	Electrical durability..... :	See Annex C	N/A
8.2.5	Conditional short-circuit current		
	The switching element shall withstand the stresses resulting from short-circuit current under the conditions specified in 9.3.4		P
8.2.7	Additional requirements for control switches suitable for isolation		
	Control switches suitable for isolation shall be tested according to 9.3.3.4 of IEC 60947-1:2020 with a value of test voltage as specified in Table 14 of IEC 60947-1:2020 corresponding to the rated impulse withstand voltage Uimp declared by the manufacturer		N/A
	Other additional requirements applicable to such control switches are under consideration		

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Clause	Requirement + Test	Result - Remark	Verdict
8.3	**Electromagnetic compatibility (EMC)**		
8.3.1	General		
	Subclause 8.3.1 of IEC 60947-1:2020 applies with the following additions:		
	The general electromagnetic environment of the equipment covered by this document is E-III, industrial according to IEC TR 63216		N/A
	The EMC tests shall be conducted at rated operational voltage Ue, or if the rated operational voltage is given as a range, then the test shall be conducted at a voltage which represents the worst-case condition. The worst case condition is assessed for example by preliminary tests		N/A
	For each test defined in 9.4.2 the use of a new EUT is permitted but during each test defined in 9.4.2 the use of a new EUT, maintenance or replacement of parts of the EUT is not permitted		N/A
	The products covered by this standard are intended for use in environment A.		N/A
	Contactor relays incorporating electronic circuits shall follow the general requirements of 8.3.1 of IEC 60947-4-1:2018		N/A
8.3.2	Immunity		
	Subclause 8.3.2 of IEC 60947-1:2020 applies with the following changes		
	Tests shall be made according to 9.4.2 of this document		N/A
	Acceptance criteria of Table 10 apply. The acceptance criteria shall be adjusted to the EUT and be recorded in the test plan		N/A
	Contactor relays incorporating electronic circuits shall follow the requirements given in 8.3.2 of IEC 60947-4-1:2018		N/A
8.3.3	Emission		
	Subclause 8.3.3 of IEC 60947-1:2020 applies with the following addition:		
	Tests shall be made according to 9.4.3. The equipment is considered to be classified group 1, class A		N/A
8.4	**Special requirements**		
8.4.1	Additional requirements for reed contact magnetic switches ..... :	See Annex D	N/A
8.4.2	Class II control circuit devices	See Annex F	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.4.3	Additional requirements for control circuit devices with integrally connected cables	See Annex G	N/A
8.4.4	Additional requirements for semiconductor switching elements for control circuit devices	See Annex H	N/A
8.4.5	Special requirements for indicator lights, indicating towers and their optional audible functions	See Annex J	N/A
8.4.6	Special requirements for control switches with direct opening action	See Annex K	N/A
8.4.7	Special requirements for mechanically linked contact elements	See Annex L	N/A
8.4.8	Additional requirements for control circuit devices incorporating a built-in communication interface (SDCI)	See Annex O	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.2	**Compliance with constructional requirements**		
9.2.2 par1	Test of materials to abnormal heat and fire		
9.2.2.1 part 1	Glow wire test (on equipment)		
	The suitability of materials used is verified by making tests: a) on the equipment; or b) on sections taken from the equipment; or c) on samples of identical material	a) on the equipment	P
	The suitability shall be determined with respect to resistance to abnormal heat and fire		P
	The manufacturer shall indicate which tests, amongst a), b) and c), shall be used ..... :	☒ a) ☐ b) ☐ c)	P
	As described in IEC 60695-2-10 and –2-11		P
	parts retaining current-carrying parts ..... :	See table	P
	all other parts ……..…..:	See table	P
	No visible flame, no sustained glowing or flames and glowing extinguish within 30 s	See table	P
	For the purpose of this test, a protective conductor is not considered as a current-carrying part.		
9.2.2.2 part 1	Flammability, hot wire ignition and arc ignition tests (on materials)		
	Suitable specimens of material shall be subjected to the following tests: a) flammability tests, in accordance with IEC 60695-11-10 b) Hot wire ignition (HWI) test, as described in Annex M c) arc ignition (AI) test, as described in Annex M		N/A
	The test c) is required only if the material is located within the 13 mm of arcing parts or live parts which are subject to loosening of connections.		N/A
	Materials located within 13 mm of arcing arts are exempt from this test if the equipment is subjected to make/break testing.		N/A
a)	Flammability tests, in accordance with IEC 60695-11-10		N/A
	Test method	☐ A) – Horizontal burning test ☐ B) – Vertical burning test	N/A
b)	hot wire ignition (HWI) test, as described in Annex M		N/A
c)	arc ignition (AI) test, as described in Annex M		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.2.4 part 1	Enclosure for equipment's		
	Degree of protection ..... :	IP20	P
	Test for first characteristic		
	Test for first numeral ..... :	☐ 1: ☒ 2: ☐ 3: ☐ 4: ☐ 5: ☐ 6:	P
	Test for second characteristic		
	Test for second numeral ..... :	☐ 1: ☐ 2: ☐ 3: ☐ 4: ☐ 5: ☐ 6: ☐ 7: ☐ 8:	P
9.2.10	Limited energy source test		
	Equipment operating under normal conditions		N/A
	In case the limited energy source requirement depends on over-current protective device(s), the device(s) shall be short-circuited.		N/A
	Maintain the limited VA energy for a period specified in 8.1.18……..:		N/A
	Maintain the limit of apparent energy for the time period indicated in Table 7, Table 8 or Table 9, as applicable ..... :		N/A
	Available apparent energy does not exceed the limits indicated in Table 7, Table 8 or Table 9, as applicable ..... :		N/A
	In case the limited energy source requirement depends on over-current protective device(s), the current rating of at least one of the protective device(s) in the current path shall not exceed the limit in Table 8.		N/A
	Test conducted under the most unfavourable combination		N/A
9.2.11	Breakdown of components		
9.2.11.1	General		

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Clause	Requirement + Test	Result - Remark	Verdict
	The breakdown of a component, identified as a result of the circuit analysis according to 8.1.19, shall be tested with the product operating with the load creating the more severe condition		N/A
	The test is not required for:		
	- when circuit analysis indicates that no other component or portion of the circuit will be overloaded as a result of open- or short-circuit failure mode of another component		N/A
	- for components in circuits supplied by limited energy sources in compliance with 8.1.18		N/A
	- for components that have previously been positively evaluated considering their failure modes and the circuit conditions in which the component is used within the device		N/A
9.2.11.2	Breakdown of component test		
	Each identified component shall be subjected to a breakdown of components test in open- and or short-circuit failure modes, whichever is most severe		N/A
	The breakdown of the component test shall be done after any circuits of the device that may affect the result of the test are fully energized and in operation		N/A
	Components, such as capacitors or diodes, are short- or open-circuited ..... :		N/A
	For a device without a dedicated enclosure, an outer metal enclosure or a wire mesh cage (with surrounded cotton on the cage) that is 1,5 times the size of the device (or different, according to manufacturer declarations) shall be provided to simulate the potential grounded parts around the device..... :		N/A
	For a dedicated enclosure is present, the cotton shall be placed over all openings. The outer dedicated enclosure or wire mesh cage (when provided) and any grounded or exposed dead metal part shall be connected through a fusible element F, according to 9.3.4.1.2 d) of IEC 60947-1:2020, to the supply circuit		N/A
	During the 10 minutes after the start of the test ..... :		N/A
	no emission of flame or molten metal		N/A
	no ignition of cotton		N/A
	no opening of the fusible element F (according to subclause 9.3.4.1.2 d) of IEC 60947-1:2020)		N/A
9.2.12	Artificial optical radiation test		

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Clause	Requirement + Test	Result - Remark	Verdict
	Conformity to 8.1.14 shall be checked by design, by review of the technical specifications of the lamp manufacturer		N/A
	if necessary, by measurement of the optical radiation followed by determination of the applicable risk groups according to IEC 62471		N/A
9.2.13	Stored charge energy test		
	The verification of the energy limit defined in 8.1.20 shall be verified by measurement and calculation, $E = 1/2 \times C V$ ..... :		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**TEST SEQUENCE I (sample No. 1)** #1: CJX2i-65 Us:440V~ 50/60Hz This test sequence is performed in B240164-01	
Test No. 1	- operating limits of contactor relays (9.3.3.2), if applicable	
Test No. 2	- temperature rise (Clause 9.3.3.3.)	
Test No. 3	- dielectric properties (Clause 9.3.3.4)	
Test No. 4	- mechanical properties of terminals (9.2.5)	
9.3.3.2	Operating limits of contactor relays	
9.3.3.3	Temperature rise	
9.3.3.4	Dielectric properties	
9.2.5	Mechanical and electrical properties of terminals	

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE II (sample No. 2)** #2: CJX2i-65 Us:415V~ 50/60Hz (NO contacts)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (9.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
9.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	380V~	
	rated operational current Ie (A) or power (kW) ..... :	0,95 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	L1: 420V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 9,62 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,96 L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	41ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	L1: 382V L2: L3:	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 9,55 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,95 L2: L3:	P
No. 2	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	Rapidly	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	42	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE II (sample No. 2)** #2: CJX2i-65 Us:415V~ 50/60Hz (NC contacts)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (9.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
9.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	380V~	
	rated operational current Ie (A) or power (kW) ..... :	0,95 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	L1: 420V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 9,62 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,96 L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	41ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	L1: 382V L2: L3:	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 9,62 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,96 L2: L3:	P
No. 2	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	Rapidly	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	42	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE II (sample No. 2)** #3: CJX2i-65 Us:380/400V~ 50/60Hz (NO contacts)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (9.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
9.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	220V~	
	rated operational current Ie (A) or power (kW) ..... :	1,6 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 16,2 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 1,62 L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	41ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	L1: 221V L2: L3:	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 16,2 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 1,62 L2: L3:	P
No. 2	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	Rapidly	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	42	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE II (sample No. 2)** #3: CJX2i-65 Us:380/400V~ 50/60Hz (NC contacts)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (9.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
9.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	220V~	
	rated operational current Ie (A) or power (kW) ..... :	1,6 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 16,2 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 1,62 L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	41ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	L1: 221V L2: L3:	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 16,2 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 1,62 L2: L3:	P
No. 2	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	Rapidly	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	41	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	42	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE II (sample No. 2)** #4: CJX2i-65 Us:240V~ 50/60Hz (NO contacts)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (9.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
9.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	DC-13	
	rated operational voltage Ue (V) ..... :	220V DC	
	rated operational current Ie (A) or power (kW) ..... :	0,15 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 199ms L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	200ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	L1: 221V L2: L3:	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant ..... :	L1: 199ms L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
No. 2	- on-time (ms) ..... :	200	P
	- operating cycles per minute ..... :	Rapidly	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	200	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	201	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE II (sample No. 2)** #4: CJX2i-65 Us:240V~ 50/60Hz (NC contacts)		
Test No. 1	- Making and breaking capacities of switching elements under normal conditions (9.3.3.5.3)		
Test No. 2	- Dielectric verification (8.3.3.5.6.b)		
9.3.3.5.3	Making and breaking capacities of switching elements under normal conditions		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	DC-13	
	rated operational voltage Ue (V) ..... :	220V DC	
	rated operational current Ie (A) or power (kW) ..... :	0,15 A	
No.1	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V DC L2: L3:	P
	- power factor/time constant ..... :	L1: 200ms L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	199ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	50	P
	- test voltage U/Ue = 1,0 (V) ..... :	L1: 221V L2: L3:	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- power factor/time constant ..... :	L1: 199ms L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,16 L2: L3:	P
No. 2	- on-time (ms) ..... :	200	P
	- operating cycles per minute ..... :	Rapidly	P
	- number of operating cycles ..... :	10	P
No. 3	- on-time (ms) ..... :	200	P
	- operating cycles per minute ..... :	60	P
	- number of operating cycles ..... :	990	P
No. 4	- on-time (ms) ..... :	201	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	5000	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE III (sample No. 3)** #5: CJX2i-65 Us:220/230V~ 50/60Hz (NO contacts)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (9.3.3.5.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	380V~	
	rated operational current Ie (A) or power (kW) ..... :	0,95 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	L1: 420V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 9,53A L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 9,53A L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	>40	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE III (sample No. 3)** #5: CJX2i-65 Us:220/230V~ 50/60Hz (NC contacts)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (9.3.3.5.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	380V~	
	rated operational current Ie (A) or power (kW) ..... :	0,95 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	L1: 420V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 9,53A L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 9,53A L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	>40	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE III (sample No. 3)** #6: CJX2i-65 Us:127V~ 50/60Hz (NO contacts)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (9.3.3.5.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	220V~	
	rated operational current Ie (A) or power (kW) ..... :	1,6 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 16,2A L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 16,2A L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	>40	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE III (sample No. 3)** #6: CJX2i-65 Us:127V~ 50/60Hz (NC contacts)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (9.3.3.5.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	AC-15	
	rated operational voltage Ue (V) ..... :	220V~	
	rated operational current Ie (A) or power (kW) ..... :	1,6 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 0,31 L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 16,2A L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 16,2A L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	>40	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE III (sample No. 3)** #7: CJX2i-65 Us:110V~ 50/60Hz (NO contacts)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (9.3.3.5.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	DC-13	
	rated operational voltage Ue (V) ..... :	220V DC	
	rated operational current Ie (A) or power (kW) ..... :	0,15 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 201ms L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 0,16A L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,16A L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	>210ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE III (sample No. 3)** #7: CJX2i-65 Us:110V~ 50/60Hz (NC contacts)		
Test No. 1	- Making and breaking capacities of switching elements under abnormal conditions (9.3.3.5.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.3.5.4	Making and breaking capacities of switching elements under abnormal conditions:		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	utilization category (AC / DC)..... :	DC-13	
	rated operational voltage Ue (V) ..... :	220V DC	
	rated operational current Ie (A) or power (kW) ..... :	0,15 A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) ..... :	L1: 243V L2: L3:	P
	- power factor/time constant ..... :	L1: 201ms L2: L3:	P
	- make operations: test current I/Ie (A) ..... :	L1: 0,16A L2: L3:	P
	- break operations: test current I/Ie (A) ..... :	L1: 0,16A L2: L3:	P
	- a.c. test: Inductor shunted by a resistor taking 3% of the total power consumed - d.c. test: test current increase from zero to steady-state value within limits of figure 9		P
	- on-time (ms) ..... :	>210ms	P
	- operating cycles per minute ..... :	6	P
	- number of operating cycles ..... :	10	P
	Behaviour and condition during and after the test:		
	- no electrical or mechanical failures		P
	- no contact welding or prolonged arcing		P
	- no blowing of the fusible element in the earth circuit		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE IV (sample No. 4)** #8: CJX2i-65 Us:48V~ 50/60Hz (NO contacts)		
Test No. 1	- Performance under conditional short-circuit current (9.3.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.4	Performance under conditional short-circuit current		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	type of SCPD ..... :	Fuse: RT18-32A; gG; 10A	
	ratings of SCPD (A / V) ..... :	10A, 500V	
	prospective current (kA) ..... :	1000 A	
	test voltage (V) U/Ue = 1,1 (V) ..... :	435 V	P
	r.m.s. test current obtained (kA) ..... :	1037 A	P
	power factor (max. 0,7) ..... :	0,66	P
	first CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) ..... :	L1: 0,48kA / 0,27kA L2: L3:	P
	time interval between test (min. 3 min) ..... :	3 min	P
	second CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) ..... :	L1: 0,42kA / 0,28kA L2: L3:	P
	time interval between test (min. 3 min) ..... :	3 min	P
	third making operation to closed switching elements: test Ip / I²dt (kA / kA²s) ..... :	L1: 0,53kA / 0,39kA L2: L3:	P
	Behaviour of the equipment during the test:		
	switching elements open by the normal actuating system		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.3.1	**TEST SEQUENCE IV (sample No. 4)** #8: CJX2i-65 Us:48V~ 50/60Hz (NC contacts)		
Test No. 1	- Performance under conditional short-circuit current (9.3.4)		
Test No. 2	- Dielectric verification (9.3.3.5.6.b)		
9.3.4	Performance under conditional short-circuit current		
	contact element (figure / form) ..... :	Figure 4e)/Form Zb	
	contact polarity..... :	--	
	type of SCPD ..... :	Fuse: RT18-32A; gG; 10A	
	ratings of SCPD (A / V) ..... :	10A, 500V	
	prospective current (kA) ..... :	1000 A	
	test voltage (V) U/Ue = 1,1 (V) ..... :	435 V	P
	r.m.s. test current obtained (kA) ..... :	1037 A	P
	power factor (max. 0,7) ..... :	0,66	P
	first CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) ..... :	L1: 0,54kA / 0,38kA L2: L3:	P
	time interval between test (min. 3 min) ..... :	3 min	P
	second CO operation by closing the separate making switch: test Ip / I²dt (kA / kA²s) ..... :	L1: 0,70kA / 0,40kA L2: L3:	P
	time interval between test (min. 3 min) ..... :	3 min	P
	third making operation to closed switching elements: test Ip / I²dt (kA / kA²s) ..... :	L1: 0,46kA / 0,36kA L2: L3:	P
	Behaviour of the equipment during the test:		
	switching elements open by the normal actuating system		P
9.3.3.5.6.b	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V ..... :	See table	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	**TEST SEQUENCE V (sample No. 5)** #17: CJX2i-65 Us:440V~ 50/60Hz This test sequence is performed in B240164-01		
Test No. 1	- Degree of protection of enclosed control circuit-devices (Annex C of IEC 60947-1:2020)		
Test No. 2	- Test of earth continuity for protective earth (9.2.9), where applicable		
Test No. 3	- Conduit pull-out test, torque test and bending test with metallic conduits (9.2.8), where applicable		
Annex C part 1	Degree of protection of enclosed control circuit-devices		
	The enclosed control circuit devices shall comply with the requirements of Annex C of IEC 60947-1:2020		P
	Degree of protection ..... :	IP20	P
	Test for first characteristic:		
	Test for first numeral (1, 2, 3, 4, 5, 6)..... :	2	P
	Test for second characteristic:		
	Test for second numeral (1, 2, 3, 4, 5, 6, 7, 8) ..... :		N/A
9.2.9	Test of earth continuity for protective earth		
	Subclause 9.2.9 of IEC 60947-1:2020 applies		
	exposed conductive parts shall be stated..... :		N/A
	A current of minimum 10 A (AC or DC) shall be passed between the exposed conductive part and the protective earth terminal ..... :		N/A
	The resistance calculated by the voltage drop and the measurement current shall not exceed 0,1 Ω ..... :		N/A
9.2.8	Conduit pull-out test, torque test and bending test with metallic conduits		N/A
	Subclause 9.2.8 of IEC 60947-1:2020 applies		
9.2.8.2	Pull-out test		
	The conduit shall be screwed without jerk into the entry with a torque equal to two-thirds of the values given in Table 22 ..... :	0,54Nm	P
	A direct pull shall be applied, without jerk, to the conduit for 5 min ..... :	5min	P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Unless otherwise specified in the relevant product standard, the pulling force shall be according to Table 20 ..... :	40N	P
	After the test, the displacement of the conduit in relation with the entry shall be less than one thread depth and there shall be no evidence of damage impairing further use of the enclosure		P
9.2.8.3	Bending test		
	A slowly increasing bending moment shall be applied without jerk to the free end of the conduit		P
	When the bending moment results in a deflection of the conduit of 25 mm per 300 mm length, or the bending moment has reached the value given in Table 21, the moment is maintained for 1 min. The test is then repeated in a perpendicular direction		P
	After the test there shall be no evidence of damage impairing further use of the enclosure		P
9.2.8.4	Torque test		
	The conduit shall be tightened without jerk with a torque according to Table 22 ..... :		P
	For enclosures provided with a single conduit connection up to and including 16 H, the tightening torque is reduced to 25 N·m		P
	After the test, it shall be possible to unscrew the conduit and there shall be no evidence of damage impairing further use of the enclosure		P

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.1.	**TEST SEQUENCE VI (sample No. 6)** #17: CJX2i-65 Us:440V~ 50/60Hz This test sequence is performed in B240164-01		
Test No. 1	- Measurement of clearances and creepage distances (8.1.4 of IEC 60947-1:2020)		
Test No. 2	- Verification of limitation of rotation of a rotary switch (9.2.7)		
Test No. 3	- Verification of actuation force or torque (9.2.6)		
8.1.4	Measurement of clearances and creepage distances		
	Clearances and creepage distances ..... :	See clause 8.1.4	P
9.2.7	Verification of limitation of rotation of a rotary switch		
	When this test is required in 8.1.5.4, it shall be tested during sequence VI of 9.3.1 The test sample shall be mounted according to the manufacturer's instructions		N/A
	The operating torque shall be measured five times and the maximum value recorded (Nm) ..... :		N/A
	The maximum torque value, multiplied by five, shall be applied to the actuator by forcing it against the means of limitation. The torque shall be applied for 10 s ..... :		N/A
	Means of limitation has not moved, become loose or prevented the actuator's normal operation		N/A
9.2.6	Verification of actuation force or moment		
	When required in 8.1.5.3, the minimum actuating force or torque shall be tested.The performance shall be as stated in 8.1.5.3		N/A
	The force (or torque) required to operate the actuator, which is given by the manufacturer, shall be compatible with the intended application, taking into account the size of the actuator, the type of control station enclosure or panel, the environment of the installation and the use for which it is intended		N/A
	Test force (N) or torque (Nm) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.4	**TEST FOR EMC**		N/A
Annex C	**SPECIAL TESTS - DURABILITY TESTS**		N/A
Annex D	**ADDITIONAL REQUIREMENTS FOR REED CONTACT MAGNETIC SWITCHES**		N/A
Annex E	**ITEMS SUBJECT TO AGREE BETWEEN MANUFACTURER AND USER**		N/A
Annex F	**CLASS II CONTROL CIRCUIT DEVICES INSULATED BY ENCAPSULATION REQUIREMENTS AND TESTS**		N/A
Annex G	**ADDITIONAL REQUIREMENTS FOR CONTROL CIRCUIT DEVICES WITH INTEGRALLY CONNECTED CABLES**		N/A
Annex H	**ADDITIONAL REQUIREMENTS FOR SEMICONDUCTOR SWITCHING ELEMENTS FOR CONTROL CIRCUIT DEVICES**		N/A
Annex J	**SPECIAL REQUIREMENTS FOR INDICATOR LIGHTS AND INDICATING TOWERS**		N/A
Annex K	**SPECIAL REQUIREMENTS FOR CONTROL SWITCHES WITH DIRECT OPENING ACTION**		N/A
Annex L	**SPECIAL REQUIREMENTS FOR MECHANICALLY LINKED CONTACT ELEMENTS**		N/A
Annex M	**TERMINAL MARKING, DISTINCTIVE NUMBER AND DISTINCTIVE LETTER FOR CONTROL CIRCUIT DEVICES**		N/A
Annex N	**Procedure to determine reliability data for electromechanical devices in control circuits used in functional safety applications**		N/A
Annex O	**ADDITIONAL REQUIREMENTS FOR CONTROL CIRCUIT DEVICES INCORPORATING A BUILT-IN COMMUNICATION INTERFACE COMPLYING WITH IEC 61131-9**		N/A

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Heating Test **#1 CJX2i-65 Us:440V~ 50/60Hz**		**P**
	Test voltage (V) ..... :	**--**	**—**
	Ambient (°C) .....:	**22,6 °C**	**—**

Thermocouple Locations	**Max. temperature measured, (°C)**	**Max. temperature limit, (°C)**
Main circuit terminals	**56,9**	**65**
Enclosure	**28,6**	**40**
Auxiliary circuit terminals	**20,6**	**65**
Supplementary information: N/A		

	TABLE: Heating test, resistance method					**P**
	Test voltage (V) ..... :			**--**		**—**
	Ambient, t_1 (°C) ..... :			**22,4**		**—**
	Ambient, t_2 (°C) ..... :			**22,6**		**—**
Temperature rise of winding	**R_1 (Ω)**	**R_2 (Ω)**	**ΔT (K)**	**Max. dT (K)**	**Insulation class**	
#1 CJX2i-65 Us:440V~ 50/60Hz	**621**	**761**	**57,7**	**110**	**B**	
Supplementary information: N/A						

	TABLE: Dielectric Strength		**P**
Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**	
Between all the terminals of the main circuit connected together (including the control and auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation	**1890**	**No**	
Between each pole of the main circuit and the other poles connected together and to the enclosure or mounting plate, with the contacts in all normal positions of operation	**1890**	**No**	
Between each control and auxiliary circuit not normally connected to the main circuit and the main circuit	**1890**	**No**	
Supplementary information:			

IEC 60947-5-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Clearance and Creepage Distance Measurements					P
clearance cl and creepage distance dcr at/of:	**Up (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**required dcr (mm)**	**dcr (mm)**
Opening contact (Main circuit)	**/**	**/**	**5,5**	**7,40**	**10**	**27,6**
Between phase (Main circuit)	**/**	**/**	**5,5**	**15,8**	**10**	**15,8**
Between live parts and other accessible parts (Main circuit)	**/**	**/**	**5,5**	**19,4**	**10**	**22,6**
Between live parts and mounting plate (Main circuit)	**/**	**/**	**5,5**	**19,4**	**10**	**22,6**
Opening contact (Auxiliary circuit)	**/**	**/**	**3**	**7,24**	**6,3**	**21,5**
Between live parts and other accessible parts (Auxiliary circuit)	**/**	**/**	**3**	**13,3**	**6,3**	**16,5**
Between live parts and mounting plate (Auxiliary circuit)	**/**	**/**	**3**	**13,3**	**6,3**	**16,5**
Supplementary information:N/A						

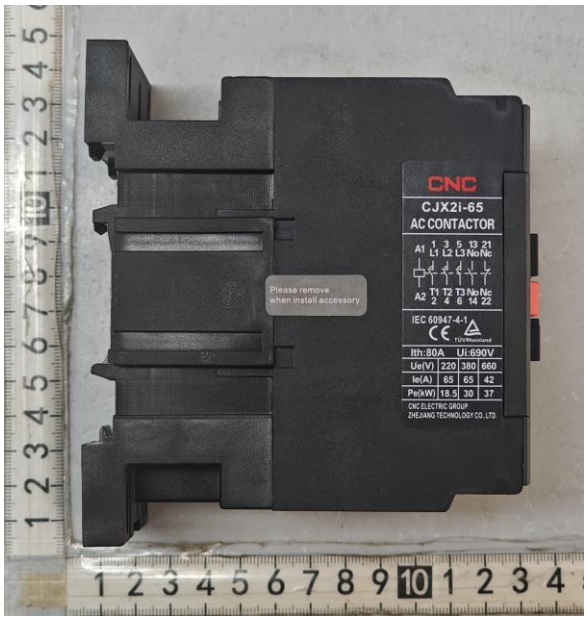
	TABLE: Needle- flame test (NFT)	N/A

	TABLE: Resistance to heat and fire - Glow wire tests							
Object/ Part No./ Material	**Manufacturer / trademark**	**Glow wire test (GWT); (°C)**						**Verdict**
		550	**650**		**750**		**850**	
			te	**ti**	**te**	**ti**		
Base	/	/	/	/	31	/	/	P
Contact support	/	/	/	/	31	/	/	P
The test specimen passed the glow wire test (GWT) with no ignition [(t_e – t_i) ≤ 2s] (Yes/No):								No
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No)..... :								Yes
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)? ..... :								Yes
Ignition of the specified layer placed underneath the test specimen (Yes/No)..... :								No
Supplementary information: 550 °C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not relevant (or applicable) for attended appliances.								

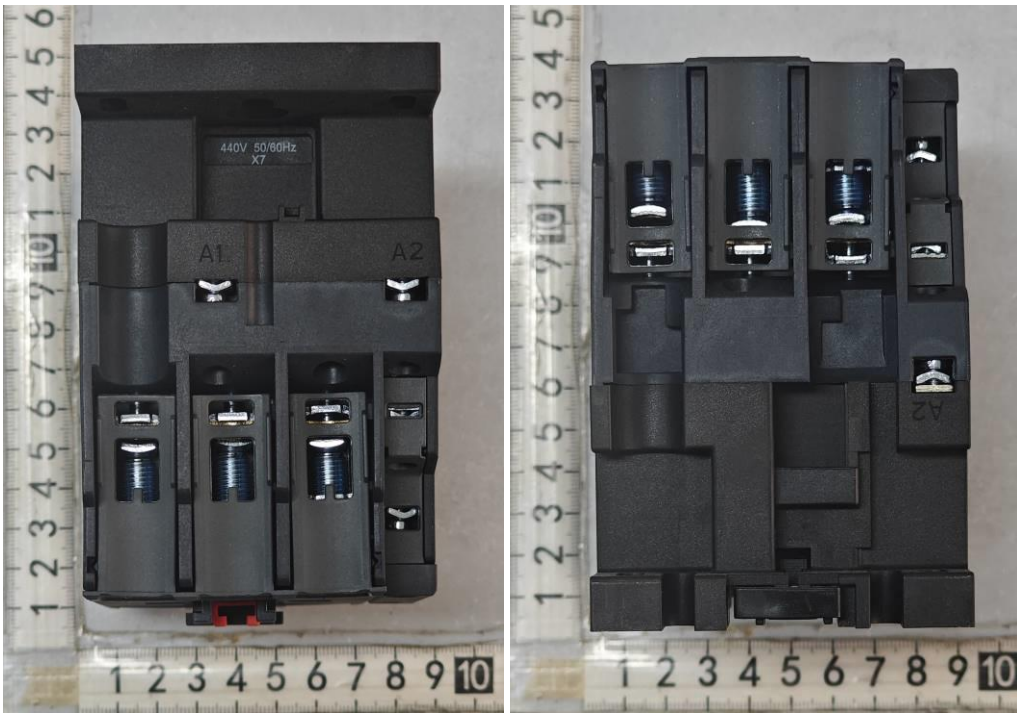
Photographs
CJX2i-65 Us:440V~ 50/60Hz

Over View

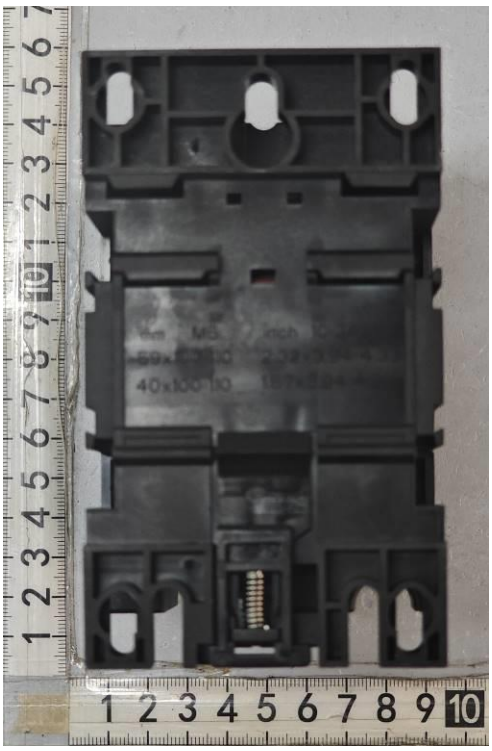
Side View



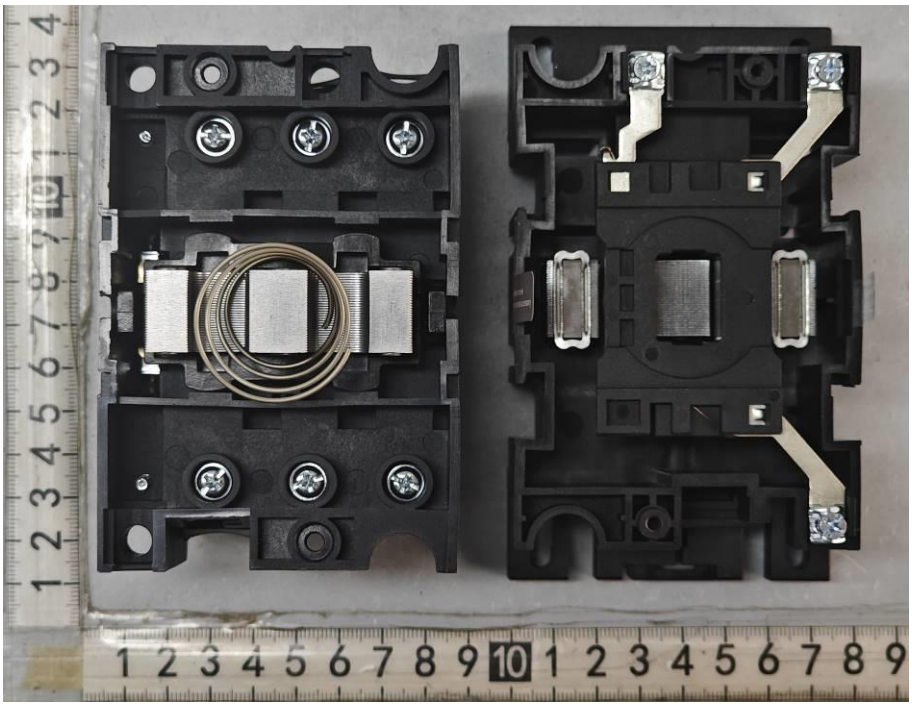
Side View



Side View

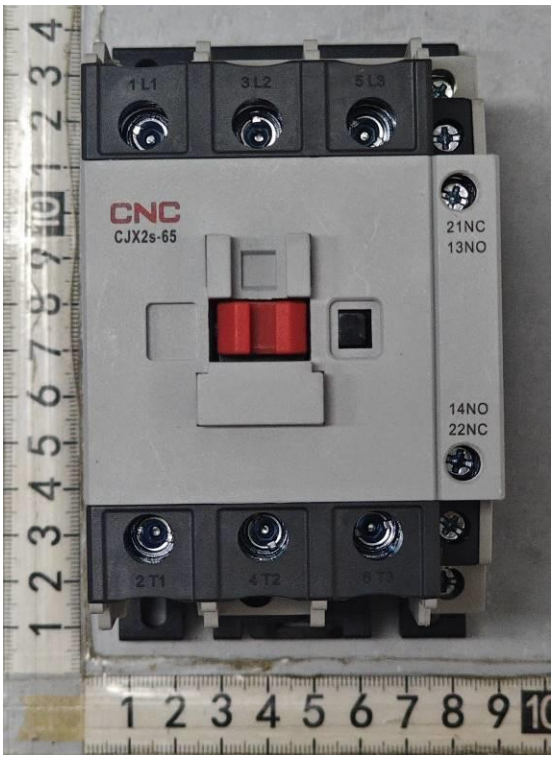


Inside View

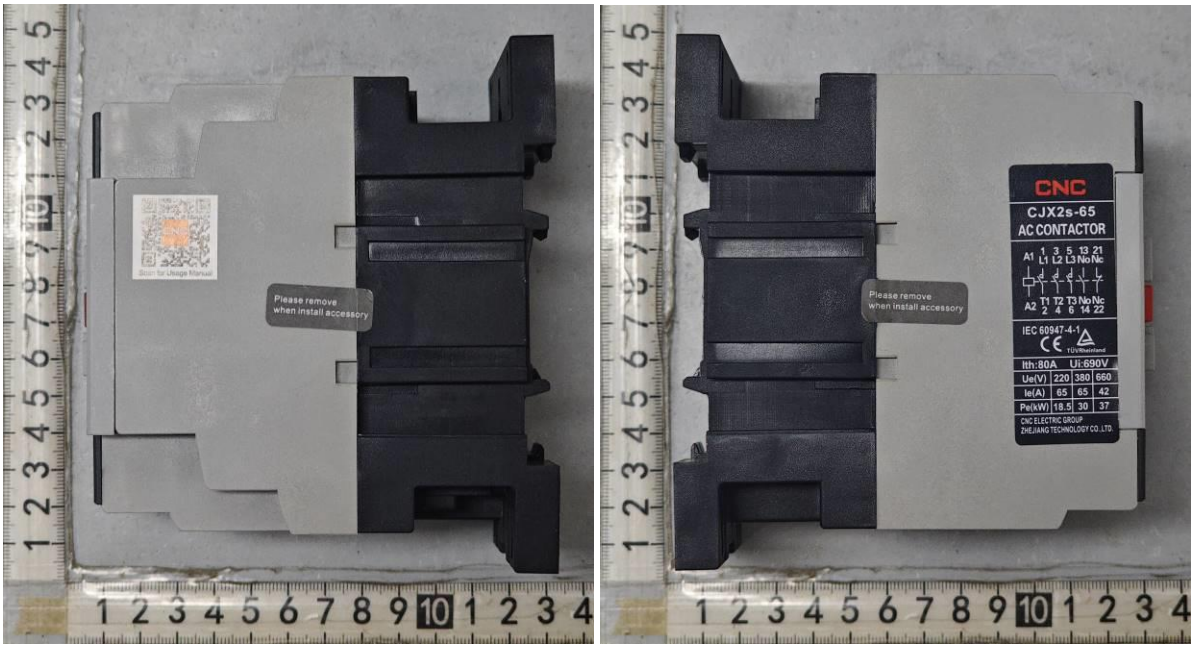


CJX2s-18 Us:440V~ 50/60Hz

Over View



Side View



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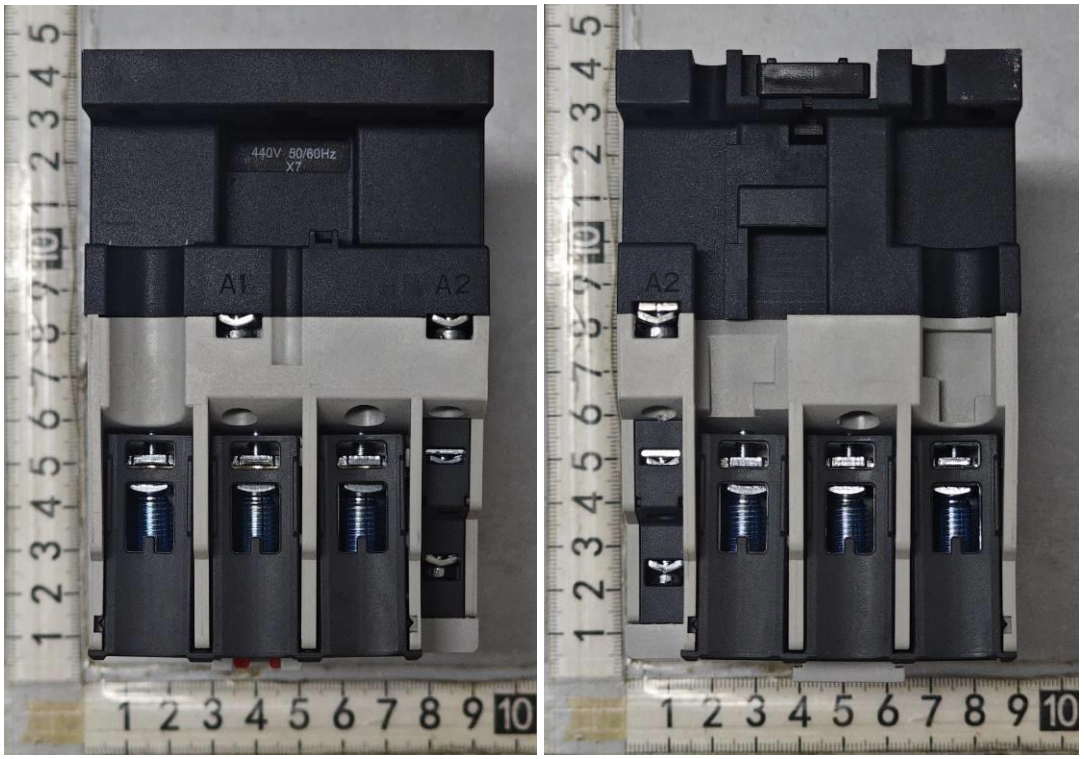

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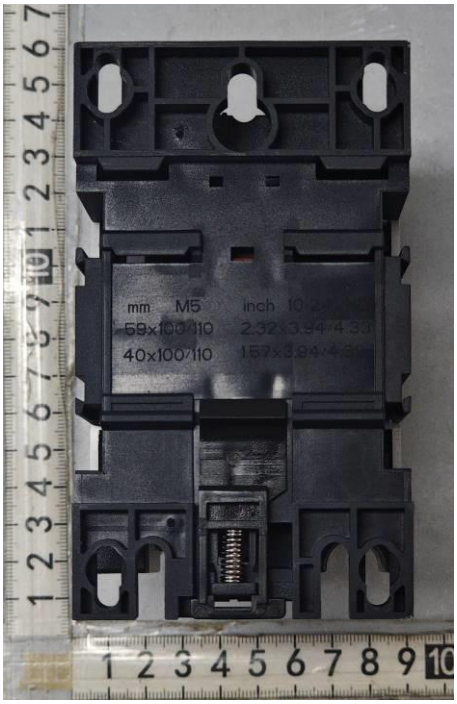
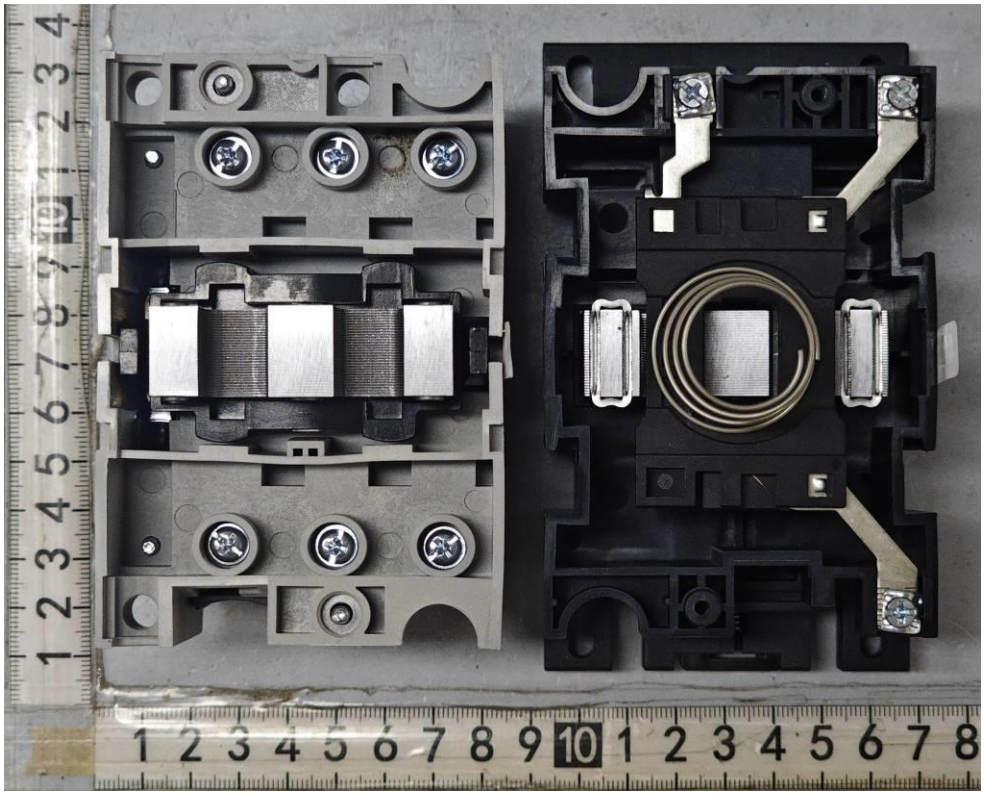


Inside View



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Type of Equipment / Tipo de producto:	Contactor AC / Contactor
Type Designation / Designación de modelo:	CJX2i-40, CJX2s-40, CJX2i-50, CJX2s-50, CJX2i-65, CJX2s-65
Brand / Marca	CNC
Certificate Number / Certificado número:	FR_721419
Report Number / Reporte número:	B240164-01, B240164-02

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