Test Report issued under the responsibility of:

TEST REPORT
IEC 60947-4-1
Contactors and motor-starters
Electromechanical contactors and motor-starters

Report Number. ..... :	C-027-CB2012CQC-042532
Date of issue ..... :	2012-12-14
Total number of pages	210
CB Testing Laboratory..... :	Fujian Inspection and Research Institute for Product Quality (FQII)
Address ..... :	No. 121, Shan Tou Jiao, West Yangqiao Road, Fuzhou, Fujian, 350002, P.R.China
Applicant's name..... :	CNC Electric Group Co.,Ltd.
Address ..... :	No.2-1,Baixiang Road, North Baixiang Town, Yueqing, ZheJiang,325603, P.R.China
Test specification:	
Standard..... :	IEC 60947-4-1:2009 (3rd Edition)
Test procedure ..... :	CB Scheme
Non-standard test method…….. :	N/A
Test Report Form No. ..... :	IEC60947_4_1A
Test Report Form(s) Originator..... :	KEMA Quality BV
Master TRF ..... :	Dated 2010-01

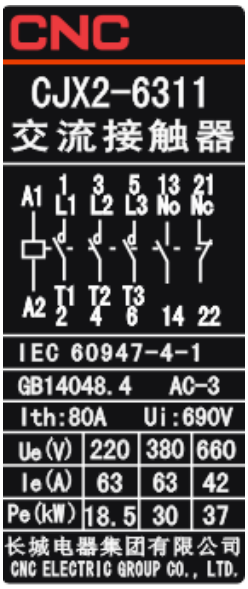
This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

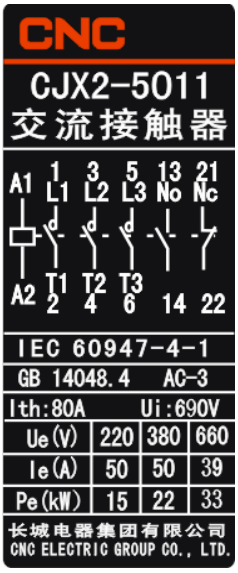
Test item description .....:	AC Contactor
Trade Mark..... :	CNC
Manufacturer ..... :	CNC Electric Group Co.,Ltd./ No.2-1,Baixiang Road, North Baixiang Town, Yueqing, ZheJiang,325603, P.R.China
Model/Type reference ..... :	CJX2-40,CJX2-50,CJX2-63
Ratings ..... :	CJX2-40: 40A/40A/34A, CJX2-50: 50A/50A/39A,CJX2-63:63A/63A/42A

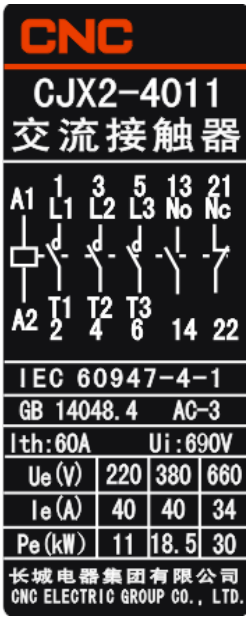
Testing procedure and testing location:			
☒	**CB Testing Laboratory**:	Fujian Inspection and Research Institute for Product Quality(FQI)	
Testing location/ address .....:		No. 121, Shan Tou Shao, West Yang Qiao Road, Fuzhou, Fujian, 350002, P.R.China	
☐	**Associated CB Laboratory:**		
Testing location/ address .....:			
	Tested by (name + signature) .....:	Wei Yunming	
	Approved by (+ signature)	Zheng Lixin	
☐	Testing procedure: TMP		
Testing location/ address .....:			
	Tested by (name + signature) ....:		
	Approved by (+ signature) .....:		
☐	Testing procedure: WMT		
Testing location/ address .....:			
	Tested by (name + signature) :		
	Witnessed by (+ signature) :		
	Approved by (+ signature) :		
☐	Testing procedure: SMT		
Testing location/ address .....:			
	Tested by (name + signature) ....:		
	Approved by (+ signature) .....:		
	Supervised by (+ signature) .....:		
☐	Testing procedure: RMT		
Testing location/ address .....:			
	Tested by (name + signature) ....:		
	Approved by (+ signature) .....:		
	Supervised by (+ signature) .....:		

Summary of testing:	
Tests performed (name of test and test clause): **a) Test sequence 1** **1) verification of temperature rise (see 9.3.3.3)** **2) verification of operation and operating limits (see 9.3.3.1 and 9.3.3.2)** **3) verification of dielectric properties (see 9.3.3.4)** **b) Test sequence 2** **1) verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (see 9.3.3.5)** **2) verification of conventional operational performance (see 9.3.3.6)** **c) Test sequence 3** **performance under short-circuit conditions (see 9.3.4)** **d) Test sequence 4 (applicable to contactors only)** **verification of ability to withstand overload currents (see 9.3.5);** **e) Test sequence 5** **1) verification of mechanical properties of terminals (see 8.2.4 of IEC 60947-1);** **2) verification of degrees of protection of enclosed contactors and starters (see annex C of part1).** **Because the IP code of the contactor is IP00, the annex C of part 1 is not applicable.** **Annex F Requirements for auxiliary contact linked with power contact(mirror cotact)(see report Attachment 1).** **The auxiliary contacts of contactor comply with IEC 60947-5-1: 2003 (3rd Edition) + A1:2009. Tests performed list below(see report Attachment 2):** **TEST SEQUENCE II** **Test No. 1 - Making and breaking capacities of switching elements** **under normal conditions (see 8.3.3.5.2)** **Test No. 2 - Dielectric verification (see 8.3.3.5.5b))** **TEST SEQUENCE III** **Test No. 1 - Making and breaking capacities of switching elements** **under abnormal conditions (see 8.3.3.5.3)** **Test No. 2 - Dielectric verification (see 8.3.3.5.5b))** **TEST SEQUENCE IV** **Test No. 1 - Performance under conditional short-circuit current (see 8.3.4)** **Test No. 2 - Dielectric verification (see 8.3.3.5.5b))** **The construction of CJX2-40, CJX2-50 and CJX2-63 is identical.They are only different in the nameplate and area of main cotact. The products with different rated control circuit voltage are only different in the diameter of the coil and the different number of turns.** **Note:The test voltage L1/L2/L3 is phase voltage in the CB report.**	**Testing location:** **No. 121, Shan Tou Jiao, West Yang Qiao Road, Fuzhou, Fujian, 350002, P.R.China**
Summary of compliance with National Differences：N/A	

Copy of marking plate






CNC
CJX2-4011
交流接触器
A1 1 3 5 13 21
L1 L2 L3 No Nc
A2 T1 T2 T3 14 22
2 4 6
IEC 60947-4-1
GB 14048.4 AC-3
Ith:60A Ui:690V
Ue(V) 220 380 660
Ie(A) 40 40 34
Pe(kW) 11 18.5 30
长城电器集团有限公司
CNC ELECTRIC GROUP CO., LTD.

Test item particulars .....:		
- kind of equipment	:	Contactor
- number of poles	:	3
- kind of current (a.c. or d.c.)	:	a.c.
- interrupting medium	:	Air
- method of operation	:	Electromagnetic
- method of control	:	Non-automatic
- method of change-over for particular types of starters		N/A
- method of connecting for particular types of starters:		N/A
-Rated and limiting values, main circuit:		
- rated operational voltage Ue (V).....:		220/380/660
- rated stator operational voltage Ues (V)	:	N/A
- rated rotor operational voltage Uer (V) .....:		N/A
- rated insulation voltage Ui (V).....:		690
- rated stator insulation voltage Uis (V)	:	N/A
- rated rotor insulation voltage Uir (V)	:	N/A
- rated impulse withstand voltage Uimp(kV)	:	8
- rated starting voltage of an auto-transformer starter(V)	:	N/A
- conventional free air thermal current Ith (A)	:	60A(CJX2-40),80A(CJX2-50),80A(CJX2-63)
- conventional enclosed thermal current Ithe (A)	:	N/A
- conventional stator thermal current Iths (A)	:	N/A
- conventional rotor thermal current Ithr (A)	:	N/A
- rated operational current Ie (A) or rated operational powers	:	CJX2-40: 40A/40A/34A, CJX2-50:50A/50A/39A,CJX2-63:63A/63A/42A
- rated stator operational current Ies (A) or rated stator operational powers	:	N/A
- rated rotor operational current Ier (A)	:	N/A
- rated uninterrupted current Iu (A)	:	N/A
- rated frequency .....:		50 Hz
- rated duties .....:		Eight-hour duty, Intermittent duty
Short-circuit characteristic:		
- rated prospective short-circuit current "r" (kA)	:	3
- rated conditional short-circuit current Iq (kA)	:	50

Rated and limiting values of the electronically controlled electro-magnet		
- kind of current	:	N/A
- power consumption	:	N/A
- rated frequency (or d.c.)	:	N/A
- rated control circuit voltage Uc (nature: a.c. / d.c.) .....:		N/A
- rated control supply voltage Us (nature: a.c. / d.c.) .....:		N/A
- nature of external control circuit devices	:	N/A
Rated and limiting values of air supply control circuit		
- rated pressure	:	N/A
- volumes of air	:	N/A
Rated and limiting values of relays and releases (overload relays)		
- 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 over-current relay or release (e.g jam sensitive, see 3.2.29) ☐ e) other relays or releases (e.g., control relay associated with devices for the thermal protection of the motor ☐ f) Stall relay or release
- **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**:**		
-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 2, 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
c) Release with residual current sensing relay:	N/A
- rated current	
- operating current	
- operating time or time-current characteristic according to Table H.1.	
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:	N/A
- 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:	N/A
- 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	N/A
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 :	N/A
- 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 : - the rated rotor insulation voltage (Uir)		N/A 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
Rated and limiting values, auxiliary circuits:		
- rated operational voltage Ue (V).....	:	AC-15,380V;DC-13,220V
- rated insulation voltage: Ui (V).....	:	690
- rated operational current: Ie (A).....	:	AC-15,0,95A;DC-13,0,15A
- kind of current.....	:	AC,DC
- rated frequency: (Hz)	:	50
- number of circuits.....	:	1NO1NC
- number and kind of contact elements	:	“X” contact,”Y” contact
- rated uninterrupted current: Iu (A)	:	N/A
- utilization category: (AC, DC, current and voltage).....	:	AC-15,380V/0,95A;DC-13,220V/0,15A
Short-circuit characteristic :		
- Rated conditional short-circuit current (kA).....	:	1
- kind of protective device	:	Fuse,RT14-10

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 ..... :	August 8, 2012
Date (s) of performance of tests ..... :	August 8, 2012~ August 30, 2012

General remarks:

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 testing laboratory.
"(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 6.2.5 of IECEE 02:

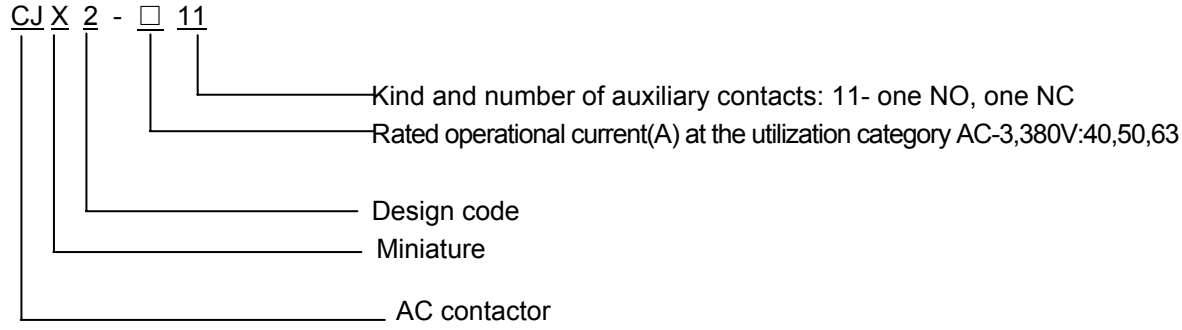
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	Not applicable

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.2-1,Baixiang Road, North Baixiang Town, Yueqing, ZheJiang,325603, P.R.China

General product information:

CJX2-40, CJX2-50, CJX2-63; Ui:690V; Ue:AC220V/AC380V/AC660V;Ith:60A(CJX2-40),80A(CJX2-50),80A(CJX2-63);Ie: 40A/40A/34A(CJX2-40), 50A/50A/39A(CJX2-50), 63A/63A/42A(CJX2-63)
Utilization category:AC-3; Us:AC36V,110V,127V,220V,380V/50Hz; 3P;
Matching auxiliary contact: Ith:10A; Ui:690V;AC-15:380V/0,95A; DC-13:220V/0,15A



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

6.2	**MARKING**		
	Data shall be marked on the equipment (mandatory):		
	a – manufacturer's name or trade mark	CNC	P
	b – type designation or serial number	CJX2-4011, CJX2-5011, CJX2-6311	P
	Data preferably marked on the equipment:		
	c - number of this standard, if the manufacturer claims compliance	IEC60947-4-1	P
	k - IP code, in case of an enclosed equipment	-	N/A
	Data shall be included on the nameplate, or on the equipment, or in the manufacturer's published literature:		
	d - rated operational voltages	AC220V/AC380V/AC660V	P
	e - utilization category and rated operational currents (or rated powers), at the rated operational voltages of the equipment	AC-3, 40A/40A/34A(CJX2-4011), 50A/50A/39A(CJX2-5011), 63A/63A/42A(CJX2-6311)	P
	f - either the value of the rated frequency/ies, or the indication d.c. (or symbol) .....:	50 Hz	P
	g - rated duty with the indication of the class of intermittent duty, if any	Eight-hour duty, intermittent duty:300/h	P
	Associated values:		
	h - rated making and breaking capacities (these indications may be replaced, where applicable, by the indication of the utilization category, see table 7)	AC-3	P
	Safety an installation:		
	i – rated insulation voltage	690V	P
	j – rated impulse withstand voltage (see 5.3.1.3)	8kV	P
	l – pollution degree	3	P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	m – 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)	50kA Type “2” SCPD: fuse,RT16-80	P
	n - Void	-	N/A
	Control circuits		
	The following information concerning control circuits shall be placed either on the coil or on the equipment:		
	o – rated control circuit voltage (Uc), nature of current and rated frequency	-	N/A
	p - if necessary, nature of current, rated frequency and rated control supply voltages (Us)	AC,50Hz, 36V,110V,127V,220V,380V	P
	Air supply systems for starter or contactors operated by compressed air		
	Q – rated supply systems of the compressed air and limits of variation of this pressure, if they are different from those specified in 8.2.1.2	-	N/A
	Auxiliary circuits:		
	r – ratings of auxiliary circuits	1NO1NC; Ui:690V;Ith:10A; AC-15,380V/0,95A; DC-13, 220V/0,15A	P
	Overload relays and releases:		
	s – characteristics according to 5.7, specifying the electronic overload relay does not contain thermal memory	-	N/A
	Additional information for certain types of contactor and starter:		
	Rheostatic starters:		
	t – circuit diagram	-	N/A
	u – severity of start, see 5.3.5.5.1	-	N/A
	v – starting time, see 5.3.5.5.1	-	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Auto-transformer starters:		
	w – rated starting voltage(s), i.e. voltage(s) at the tapping terminals	-	N/A
	Vacuum contactors and starters:		
	x – maximum permissible altitude of the site of installation, if less than 2000 m	-	N/A
	EMC		
	y – environment A and/or B: see 7.3.1 of part 1	☐ A ☐ B	N/A
	z – special requirements, if applicable, for example shielded or twisted conductors	-	N/A
	Sub clause 5.2 of part 1 applies to contactors, starters and overload relays with the following additions:		
	Data under items d) to x in 6.1.2 shall be included on the nameplate or on the equipment or in the manufacturer's published literature:	Compliance	P
	Data under items c) and k) in 6.1.2 shall preferably be marked on the equipment	Compliance	P
	In case of electronically controlled electromagnets, information other than given in o) and p) of 6.1.2 may also be necessary: see 5.5 and annex E	-	N/A
	If the manufacturer declares an electronic overload relay without thermal memory, this shall be marked on the device.	-	N/A
6.3	**Instruction for installation, operation and maintenance**		
	The manufacture shall specify, in his documents or catalogues:	Compliance	P
	- the conditions for installation, operation and maintenance, if any, of the equipment during operation and after a fault	Compliance	P
	- the specify the measures to be taken with regard to EMC, if any,	-	N/A

IEC 60947-4-1			
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 A. Use of this product in environment B may cause unwanted electromagnetic disturbances in which case the user may be required to taken 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.	Compliance	P
	- manufacturer advice on the measures to be taken in the event of a short-circuit	Compliance	P
	In case of protected starters (see 3.2.8), the manufacturer shall also provide the necessary mounting and wiring instruction	-	N/A
8.1	**Construction 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	Compliance	P
8.1.1	**MATERIALS**		
	Sub clause of 7.1.1 of part 1 applies with the following additions	Compliance	P
	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	Compliance	P
	The suitability shall determined with respect to resistance to abnormal heat and fire	Compliance	P
	The manufacturer shall indicate which tests, amongst a), b) and c), shall be used	☐ a) ☒ b) ☐ c)	P

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

	Resistance to abnormal heat and to fire		
	Glow wire test (on equipment), according Cl. 7.1.1.1 of part 1		
	As described in IEC 60695-2-10 and –2-11		
	parts retaining current-carrying parts ..... Remark : a protective conductor is not considered as a current-carrying part	☒ 850 – 15°C or ☐ 960 – 15°C 30 s	P
	all other parts	☒ 650 – 10°C 30 s	P
	No visible flame, no sustained glowing or flames and glowing extinguish within 30 s	Compliance	P
	Flammability, hot wire ignition and arc ignition tests (on materials)), according Cl. 7.1.1.1 of part 1		
	When tests on materials are used, they shall be made according to the tests for flammability classification, hot wire ignition and ,where applicable, arc ignition, as specified in 8.2.1.1.2 The materials used shall comply with the values given in table M.1 of part 1 according to the manufacturer's chosen flammability category (see IEC 60695-11-10)	-	N/A
	Flammability, hot wire ignition an arc ignition tests (on materials) according 8.2.1.1.2 of part 1		
	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
a)	**Flammability tests, in accordance with IEC 60695-11-10**		
	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
8.1.2	**Current-carrying parts and their connection (see 7.1.2)**		
	No contact pressure through insulating materials	Compliance	P
8.1.3	**Clearances and creepage distances**		
	CLAUSE 7.1.3 OF PART 1 APPLIES	Compliance	P
	Clearances		P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated impulse withstand voltage (see test sequence I)	8 kV	P
	Creepage distances		P
	Pollution degree .....:	3	—
	Comparative tracking index (V) .....:	175≤CTI<400	—
	Material group .....:	IIIa	—
	Rated insulation voltage Ui (V) .....:	690	—
	Minimum creepage distances (mm) .....:	10	—
	Measured creepage distances (mm) .....:	17,60	—
	In case Uimp is not indicated	-	N/A
8.1.4	**Actuator**		
	Sub-clause 7.1.4 of part 1 applies when the actuator is manually operated with the following addition:		—
	The operating handle of the manually operated switching device of combination starter shall be provided with means for padlocking it in the OFF position.	-	N/A
8.1.4.3	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	**INDICATION OF CONTACT POSITION**		
8.1.5.1	Indication means, see 7.1.5.1 part 1 applies to manually operated starters	-	N/A
8.1.5.2	Indication by the actuator, see 7.1.5.1 part 1	-	N/A
8.1.6	**Additional safety requirements for equipment suitable for isolation,** see clause 7.1.6.1 part 1 applies and the additions marked with *)		N/A
7.1.6.1 part 1	Additional constructional requirements:		
	- marking according to 5.2.	-	N/A
	- indication of the position of the contacts	-	N/A
	- construction of the actuating mechanism	-	N/A
	- minimum clearances across open contacts (see Table XIII, Part 1) (mm) .....:		—
	- measured clearances (mm) .....:	-	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- test Uimp across gap (kV) .....:	-	N/A
	*) Devices provided with positions like trip position or stand-by positions which are not the indicated open position shall be clearly marked.	-	N/A
	*) An indicator having only one position of rest shall not be considered as appropriate to indicate the position of the main contact.	-	N/A
7.1.6.2 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 .....:	-	—
	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
7.1.6.3 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) .....:	-	—
	Rated impulse withstand voltage (kV) .....:	-	—
	Test Uimp on open main contacts at the test force	-	N/A
8.1.7	**Terminals**		
	clause 7.1.7.1 part 1 applies		
7.1.7.1 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

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Clause	Requirement + Test	Result - Remark	Verdict
	If required by application, terminals and conductors may be connected by means of cable lugs for copper conductors only	-	N/A
8.2.4 part 1	**Mechanical properties of terminals(For main circuit)**		
	see clause 8.2.4 part 1 applies		
8.2.4.2	Mechanical strength of terminals		P
	maximum cross-sectional area of conductor (mm²) :	25	
	diameter of thread (mm) .....:	7,84	
	torque (Nm) .....:	3,5	
	5 times on 2 separate clamping units	Compliance	P
8.2.4.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm²) .....:	10	
	number of conductor of the smallest cross section .....:	1	
	diameter of bushing hole (mm).....:	9,5	
	height between the equipment and the platen (mm) .....:	279	
	mass at the conductor(s) (kg) .....:	2,0	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
8.2.4.4	Pull-out test		
	force (N) .....:	90	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Flexion test		
	conductor of the largest cross-sectional area (mm²) .....:	25	
	number of conductor of the largest cross-sectional .....:	1	
	diameter of bushing hole (mm) .....:	12,7	

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Clause	Requirement + Test	Result - Remark	Verdict
	height between the equipment and the platen (mm) .....:	298	
	mass at the conductor(s) (kg) .....:	4,5	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Pull-out test		
	force (N) .....:	135	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Flexion test		
	conductor of the largest and smallest cross-sectional area (mm²) .....:	-	
	number of conductor of the smallest cross sectional, number of conductor of the largest cross sectional .....:	-	
	diameter of bushing hole (mm) .....:	-	
	height between the equipment and the platen (mm) .....:	-	
	mass at the conductor(s) (kg) .....:	-	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	-	N/A
	Pull-out test		
	force (N) .....:	-	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	-	N/A
7.1.7.2	Connecting capacity		
	type of conductors .....:	Rigid and stranded type	
	minimum cross-sectional area of conductor (mm²) .....:	10	
	maximum cross-sectional area of conductor (mm²) .....:	25	

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Clause	Requirement + Test	Result - Remark	Verdict
	number of conductors simultaneously connectable to the terminal .....:	1	
7.1.7.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation	Compliance	P
	clamping screws and nuts shall not serve to fix any other component	Compliance	P
8.2.4 part 1	**Mechanical properties of terminals(For auxiliary circuit)**		
	see clause 8.2.4 part 1 applies		
8.2.4.2	Mechanical strength of terminals		P
	maximum cross-sectional area of conductor (mm²) :	1,5	
	diameter of thread (mm) .....:	3,42	
	torque (Nm) .....:	0,8	
	5 times on 2 separate clamping units	Compliance	P
8.2.4.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm²) .....:	0,75	
	number of conductor of the smallest cross section .....:	2	
	diameter of bushing hole (mm).....:	6,4	
	height between the equipment and the platen (mm) .....:	260	
	mass at the conductor(s) (kg) .....:	0,4	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
8.2.4.4	Pull-out test		
	force (N) .....:	30	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Flexion test		

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Clause	Requirement + Test	Result - Remark	Verdict
	conductor of the largest cross-sectional area (mm²) .....:	1,5	
	number of conductor of the largest cross-sectional .....:	2	
	diameter of bushing hole (mm) .....:	6,4	
	height between the equipment and the platen (mm) .....:	260	
	mass at the conductor(s) (kg) .....:	0,4	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Pull-out test		
	force (N) .....:	40	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Flexion test		
	conductor of the largest and smallest cross-sectional area (mm²) .....:	1,5/0,75	
	number of conductor of the smallest cross sectional, number of conductor of the largest cross sectional .....:	1/1	
	diameter of bushing hole (mm) .....:	6,4/6,4	
	height between the equipment and the platen (mm) .....:	260/260	
	mass at the conductor(s) (kg) .....:	0,4/0,4	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Pull-out test		
	force (N) .....:	40/30	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
7.1.7.2	Connecting capacity		

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Clause	Requirement + Test	Result - Remark	Verdict
	type of conductors .....:	Rigid and solid type	
	minimum cross-sectional area of conductor (mm²) .....:	0,75	
	maximum cross-sectional area of conductor (mm²) .....:	1,5	
	number of conductors simultaneously connectable to the terminal .....:	2	
7.1.7.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation	Compliance	P
	clamping screws and nuts shall not serve to fix any other component	Compliance	P
8.2.4 part 1	**Mechanical properties of terminals(For control circuit)**		
	see clause 8.2.4 part 1 applies		
8.2.4.2	Mechanical strength of terminals		P
	maximum cross-sectional area of conductor (mm²) :	1,5	
	diameter of thread (mm) .....:	3,42	
	torque (Nm) .....:	0,8	
	5 times on 2 separate clamping units	Compliance	P
8.2.4.3	Testing for damage to and accidental loosening of conductor (flexion test)		
	conductor of the smallest cross-sectional area (mm²) .....:	0,5	
	number of conductor of the smallest cross section .....:	2	
	diameter of bushing hole (mm).....:	6,4	
	height between the equipment and the platen (mm) .....:	260	
	mass at the conductor(s) (kg) .....:	0,3	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.4.4	Pull-out test		
	force (N) .....:	30	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Flexion test		
	conductor of the largest cross-sectional area (mm²) .....:	1,5	
	number of conductor of the largest cross-sectional .....:	2	
	diameter of bushing hole (mm) .....:	6,4	
	height between the equipment and the platen (mm) .....:	260	
	mass at the conductor(s) (kg) .....:	0,4	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Pull-out test		
	force (N) .....:	40	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
	Flexion test		
	conductor of the largest and smallest cross-sectional area (mm²) .....:	1,5/0,5	
	number of conductor of the smallest cross sectional, number of conductor of the largest cross sectional .....:	1/1	
	diameter of bushing hole (mm) .....:	6,4/6,4	
	height between the equipment and the platen (mm) .....:	260/260	
	mass at the conductor(s) (kg) .....:	0,4/0,3	
	135 continuous revolutions: the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Pull-out test		
	force (N) .....:	40/30	
	1 min, the conductor shall neither slip out of the terminal nor break near the clamping unit	Compliance	P
7.1.7.2	Connecting capacity		
	type of conductors .....:	Rigid and solid type	
	minimum cross-sectional area of conductor (mm²) .....:	0,5	
	maximum cross-sectional area of conductor (mm²) .....:	1,5	
	number of conductors simultaneously connectable to the terminal .....:	2	
7.1.7.3	Connection		
	terminals for connection to external conductors shall be readily accessible during installation	Compliance	P
	clamping screws and nuts shall not serve to fix any other component	Compliance	P
8.1.7.4	**Terminal identification and marking,**		
8.1.7.4	Subclause 7.1.7.4 of part 1 applies with the additional requirements of annex A	Compliance	P
	terminal intended exclusively for the neutral conductor	-	N/A
	protective earth terminal	-	N/A
	other terminals	-	N/A
8.1.8	**Additional requirements for equipment provided with a neutral pole**		
	Sub clause 7.1.8 of part 1 applies	-	N/A
	marking of 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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
8.1.9	**Provisions for earthing**		
	Sub clause 7.1.9 of part 1 applies	-	N/A
7.1.9.1 part 1	The exposed conductive parts shall be electrically interconnected and connected to a protective earth terminal	-	N/A
7.1.9.2 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
7.1.9.3 part1	Protective earth terminal marking and identification	-	N/A
8.1.10	**Enclosure for equipment**		
7.1.10.1 part1	Design		
	Sub clause 7.1.10 of part 1 applies with the follow additions	-	N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
7.1.10.2 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
8.1.11	**Degree of protection of enclosed contactors and starters**		
	Sub clause 7.1.11 of part 1 applies	-	N/A
	Degree of protection .....:	-	N/A
	Test for first characteristic		N/A
	Test for first numeral .....:	1:- 2: - 3:- 4:- 5:- 6:-	
	Test for second characteristic		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test for second numeral .....:	1:- 2:- 3:- 4:- 5:- 6:- 7:- 8:-	

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.a	**TEST SEQUENCE I (#01,CJX2-6311)**		
	- verification of temperature rise (Clause 9.3.3.3)		**P**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**P**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	Compliance	
	ambient temperature 10-40 C .....:	30	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	No enclosure	
	material of enclosure .....:	No enclosure	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	Compliance	
	loaded as stated in 8.2.2.4	Compliance	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	80,0	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	25/1000	
	- temperature rise of main circuit terminals (K) ...:	≤ 65 K see page 184	P
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	Compliance	
	The temperature rise shall be measures during the test of 9.3.3.3.4	Compliance	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	1,0/1000	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	≤ 65 K see page 184	P
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measured during the test of 9.3.3.3.4	Compliance	
	- rated control supply voltage Us (V) .....:	380	
	- class of insulating material .....:	B	
	- uninterrupted or eight-hour duty windings	Eight-hour duty	
	- temperature rise of control circuit terminals (K) :	≤ 65 K see page 184	P
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	Compliance	
	- rated control supply voltage Us (V) .....:	380	
	- class of insulating material .....:	B	
	- intermittent duty class.....:	300	
	- close open operating cycle.....:	300 times per hour	
	- on-load factor.....:	40%	
	- temperature rise of control circuit terminals (K) :	≤ 65 K see page 185	P
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	0,95	
	The temperature rise shall be measures during the test of 9.3.3.3.4	Compliance	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	1,0/1000	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	≤ 65 K see page 184	P
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	380	
	frequency (Hz) .....:	50	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	323V~418V	P
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	Compliance	P
	ambient temperature(-5 °C) for 100% Us	-5°C	
	Drop out test method	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	162V~163V	P
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

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Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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Clause	Requirement + Test	Result - Remark	Verdict

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……. :	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	Compliance	

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	Compliance	P
	Terminal holes covered	☒ yes ☐ no	P
	- rated impulse withstand voltage (kV) .....:	8	
	- test Uimp main circuits (kV) .....:	9,8	P
	- test Uimp auxiliary circuits (kV) .....:	9,8	P
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:	690	
	- main circuits, test voltage for 5 s (V) .....:	1890	P
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	1890	P
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.a	**TEST SEQUENCE I (#02,CJX2-5011)**		
	- verification of temperature rise (Clause 9.3.3.3)		**P**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**P**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	Compliance	
	ambient temperature 10-40 C .....:	30	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	No enclosure	
	material of enclosure .....:	No enclosure	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	Compliance	
	loaded as stated in 8.2.2.4	Compliance	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	80,0	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	25/1000	
	- temperature rise of main circuit terminals (K) ...:	≤ 65 K see page 185	P
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	Compliance	
	The temperature rise shall be measures during the test of 9.3.3.3.4	Compliance	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	1,0/1000	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	≤ 65 K see page 185	P
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measured during the test of 9.3.3.3.4	Compliance	
	- rated control supply voltage Us (V) .....:	380	
	- class of insulating material .....:	B	
	- uninterrupted or eight-hour duty windings	Eight-hour duty	
	- temperature rise of control circuit terminals (K) :	≤ 65 K see page 186	P
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	Compliance	
	- rated control supply voltage Us (V) .....:	380	
	- class of insulating material .....:	B	
	- intermittent duty class.....:	300	
	- close open operating cycle.....:	300 times per hour	
	- on-load factor.....:	40%	
	- temperature rise of control circuit terminals (K) :	≤ 65 K see page 186	P
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	0,95	
	The temperature rise shall be measures during the test of 9.3.3.3.4	Compliance	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	1,0/1000	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	≤ 65 K see page 185	P
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	-	
	frequency (Hz) .....:	-	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

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Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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

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……. :	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	-	

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	-	N/A
	Terminal holes covered	☐ yes ☐ no	N/A
	- rated impulse withstand voltage (kV) .....:	-	
	- test Uimp main circuits (kV) .....:	-	N/A
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:	-	
	- main circuits, test voltage for 5 s (V) .....:	-	N/A
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	-	N/A
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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.a	**TEST SEQUENCE I (#03,CJX2-4011)**		
	- verification of temperature rise (Clause 9.3.3.3)		**P**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**P**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	Compliance	
	ambient temperature 10-40 C .....:	30	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	No enclosure	
	material of enclosure .....:	No enclosure	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	Compliance	
	loaded as stated in 8.2.2.4	Compliance	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	60,0	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	16/1000	
	- temperature rise of main circuit terminals (K) ...:	≤ 65 K see page 187	P
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	Compliance	
	The temperature rise shall be measures during the test of 9.3.3.3.4	Compliance	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	1,0/1000	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	≤ 65 K see page 187	P
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measured during the test of 9.3.3.3.4	Compliance	
	- rated control supply voltage Us (V) .....:	380	
	- class of insulating material .....:	B	
	- uninterrupted or eight-hour duty windings	Eight-hour duty	
	- temperature rise of control circuit terminals (K) :	≤ 65 K see page 187	P
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	Compliance	
	- rated control supply voltage Us (V) .....:	380	
	- class of insulating material .....:	B	
	- intermittent duty class.....:	300	
	- close open operating cycle.....:	300 times per hour	
	- on-load factor.....:	40%	
	- temperature rise of control circuit terminals (K) :	≤ 65 K see page 188	P
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	0,95	
	The temperature rise shall be measures during the test of 9.3.3.3.4	Compliance	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	1,0/1000	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	≤ 65 K see page 187	P
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	-	
	frequency (Hz) .....:	-	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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Clause	Requirement + Test	Result - Remark	Verdict

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…….:	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	-	N/A
	Terminal holes covered	☐ yes ☐ no	N/A
	- rated impulse withstand voltage (kV) .....:	-	
	- test Uimp main circuits (kV) .....:	-	N/A
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:	-	
	- main circuits, test voltage for 5 s (V) .....:	-	N/A
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	-	N/A
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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.a	**TEST SEQUENCE I (#04,CJX2-6311,Us:36V)**		
	- verification of temperature rise (Clause 9.3.3.3)		**N/A**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**N/A**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	-	
	ambient temperature 10-40 C .....:	-	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	-	
	material of enclosure .....:	-	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	-	
	loaded as stated in 8.2.2.4	-	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- temperature rise of main circuit terminals (K) ...:	-	N/A
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	-	N/A
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- uninterrupted or eight-hour duty windings	-	
	- temperature rise of control circuit terminals (K) :	-	N/A
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- intermittent duty class.....:	-	
	- close open operating cycle.....:	-	
	- on-load factor.....:	-	
	- temperature rise of control circuit terminals (K) :	-	N/A
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	< ____ see page ____	N/A
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	36	
	frequency (Hz) .....:	50	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	30,6V~39,6V	P
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	Compliance	P
	ambient temperature(-5 °C) for 100% Us	-5 °C	
	Drop out test method	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	11,5V~11,7V	P
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

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Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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Clause	Requirement + Test	Result - Remark	Verdict

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……. :	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	-	N/A
	Terminal holes covered	☐ yes ☐ no	N/A
	- rated impulse withstand voltage (V) .....:	-	
	- test Uimp main circuits (kV) .....:	-	N/A
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:		
	- main circuits, test voltage for 5 s (V) .....:	-	N/A
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	-	N/A
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.a	**TEST SEQUENCE I (#05,CJX2-6311,Us:110V)**		
	- verification of temperature rise (Clause 9.3.3.3)		**N/A**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**N/A**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	-	
	ambient temperature 10-40 C .....:	-	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	-	
	material of enclosure .....:	-	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	-	
	loaded as stated in 8.2.2.4	-	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- temperature rise of main circuit terminals (K) ...:	-	**N/A**
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	-	**N/A**
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- uninterrupted or eight-hour duty windings	-	
	- temperature rise of control circuit terminals (K) :	-	**N/A**
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- intermittent duty class.....:	-	
	- close open operating cycle.....:	-	
	- on-load factor.....:	-	
	- temperature rise of control circuit terminals (K) :	-	**N/A**
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	< ____ see page ____	N/A
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	110	
	frequency (Hz) .....:	50	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	93,5V~121V	P
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	Compliance	P
	ambient temperature(-5 °C) for 100% Us	-5 °C	
	Drop out test method	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	44,8V~44,6V	P
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict

	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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Clause	Requirement + Test	Result - Remark	Verdict

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……. :	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	-	N/A
	Terminal holes covered	☐ yes ☐ no	N/A
	- rated impulse withstand voltage (V) .....:	-	
	- test Uimp main circuits (kV) .....:	-	N/A
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:		
	- main circuits, test voltage for 5 s (V) .....:	-	N/A
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	-	N/A
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.a	**TEST SEQUENCE I (#06,CJX2-6311,Us:127V)**		
	- verification of temperature rise (Clause 9.3.3.3)		**N/A**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**N/A**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	-	
	ambient temperature 10-40 C .....:	-	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	-	
	material of enclosure .....:	-	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	-	
	loaded as stated in 8.2.2.4	-	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- temperature rise of main circuit terminals (K) ...:	-	**N/A**
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	-	**N/A**
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- uninterrupted or eight-hour duty windings	-	
	- temperature rise of control circuit terminals (K) :	-	**N/A**
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- intermittent duty class.....:	-	
	- close open operating cycle.....:	-	
	- on-load factor.....:	-	
	- temperature rise of control circuit terminals (K) :	-	**N/A**
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	< ____ see page ____	N/A
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	127	
	frequency (Hz) .....:	50	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	108V~140V	P
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	Compliance	P
	ambient temperature(-5 °C) for 100% Us	-5 °C	
	Drop out test method	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	58,2V~58,3V	P
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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Clause	Requirement + Test	Result - Remark	Verdict

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……. :	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	-	N/A
	Terminal holes covered	☐ yes ☐ no	N/A
	- rated impulse withstand voltage (V) .....:	-	
	- test Uimp main circuits (kV) .....:	-	N/A
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:		
	- main circuits, test voltage for 5 s (V) .....:	-	N/A
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	-	N/A
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.a	**TEST SEQUENCE I (#07,CJX2-6311,Us:220V)**		
	- verification of temperature rise (Clause 9.3.3.3)		**N/A**
	- verification of operation and operating limits (Clause 9.3.3.1 and 9.3.3.2)		**P**
	- verification of dielectric properties (Clause 9.3.3.4)		**N/A**
9.3.3.3	**Temperature rise**		
	Sub clause 8.3.3.3. of part 1 applies	-	
	ambient temperature 10-40 C .....:	-	
	Contactor		
	test enclosure W x H x D (mm x mm x mm) .....:	-	
	material of enclosure .....:	-	
9.3.3.3.4	Main circuits, test conditions:		
	Sub clause 8.3.3.3.4 of part 1 applies with following addition	-	
	loaded as stated in 8.2.2.4	-	
	- setting of the maximum current setting .....:	-	
	- setting overload relay .....:	-	
	- conventional thermal current Ith (A) .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- temperature rise of main circuit terminals (K) ...:	-	**N/A**
9.3.3.3.5	Control circuit, test conditions:		
	Sub clause 8.3.3.3.5. of part 1 applies with following addition	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A) at their rated voltage .....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature rise of control circuit (K) .....:	-	**N/A**
9.3.3.3.6	Coils and electromagnets circuit, test conditions:		
	a) Uninterrupted and eight-hour duty windings (8.2.2.6.1)		
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- uninterrupted or eight-hour duty windings	-	
	- temperature rise of control circuit terminals (K) :	-	**N/A**
	b) Intermittent duty windings (8.2.2.6.2)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- intermittent duty class.....:	-	
	- close open operating cycle.....:	-	
	- on-load factor.....:	-	
	- temperature rise of control circuit terminals (K) :	-	**N/A**
	c) temporary or periodic duty (8.2.2.6.3)		
	- no current flowing though the main circuit	-	
	- rated control supply voltage Us (V) .....:	-	
	- class of insulating material .....:	-	
	- close open operating cycle.....:	-	
	- on-load time.....:	-	
	- temperature rise of control circuit terminals (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	-	
	The temperature rise shall be measures during the test of 9.3.3.3.4	-	
	- conventional thermal current Ith (A).....:	-	
	- conventional enclosed thermal current Ithe (A) .:	-	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable cross-section (mm²) .....:	-	
	- temperature rise of auxiliary circuit terminals (K) .....:	< ____ see page ____	N/A
9.3.3.3.8	Starting resistors for rheostatic rotor starters test conditions:		
	Normally loaded with their current value I_m	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic	See page _____	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	
	- cable cross-section (mm²) .....:	-	
	- temperature rise of starting resistor terminals (K) .....:	See table 3 of part 1	
	- temperature rise of starting resistor enclosure (K)	See table 3 of part 1	
	- temperature rise of issuing air (K)	See table 3 of part 1	
9.3.3.3.9	Auto-transformers for two-step auto-transformers starters		
	Normally loaded with max. Starting current multiplied with 0,8 x $^{\text{starting voltage}}/_{Ue}$	-	
	Number of starts per hour.....:	-	
	Rated duty.....:	-	
	Starting characteristic.....:	See page	
	- cable/busbar cross-section (mm²) / (mm) .....:	-	N/A
	Temperature rise of:		N/A
	- windings (K), See table 5 (+15 %).....:	-	N/A
	- operating means (K) , See table 3 of part 1 .....:	-	
	- parts intended to be touched but not hand held (K) , See table 3 of part 1	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts which need not be touched during normal operation (K) , See table 3 of part 1	-	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) :	-	
	Rated full load current (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:		
8.2.1.2.1	Electromagnetic contactors and starters		
	rated control supply voltage Us (V) .....:	220	
	frequency (Hz) .....:	50	
	declared ambient temperature(>40 °C) for 100% Us :	-	
	limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	187V~242V	P
	limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	Compliance	P
	ambient temperature(-5 °C) for 100% Us	-5 °C	
	Drop out test method	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	88,2V~88,3V	P
8.2.1.2.2	Contactors and starters with electronically controlled electromagnet		
	Rated control supply voltage Us (V) .....:	-	
	Frequency (Hz) .....:	-	
	Declared ambient temperature(>40 °C) for 100% Us	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated control supply voltage Us .....:	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
	Ambient temperature(-5 °C) for 100% Us	-	
	Drop out test method	-	N/A
	Limits of drop out and open fully are: 75% to 20% for a.c. and 75% to 10% for d.c. .....:	-	N/A
8.2.1.2.3	Electro-pneumatic contactors and starters		
	Rated air supply pressure (Bar) .....:	-	
	Declared ambient temperature(>40 °C) for 100% of the rated air supply pressure (Bar)	-	
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure (Bar):	-	N/A
	Limits of drop out and open fully are: 75% to 10% of rated air supply pressure(Bar).....:	-	N/A
	Ambient temperature(-5 °C) for 100% of the rated air supply pressure(Bar)	-	N/A
	Limits of close satisfactorily at any value between 85% and 110% of rated air supply pressure(Bar:	-	N/A
	Limits of drop out and open fully are: 75% to 10% for the rated air supply pressure(Bar) :	-	N/A
8.2.1.2.4	Capacitive drop out test		

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Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor shall be inserted in series in the supply circuit U_s, the total length of the connecting conductors being ≤ 3 m.	-	
	The capacitor is short-circuit by a switch of negligible impedance.	-	
	The supply voltage shall then be adjusted to 110 % U_s. ..... :	-	
	The value of the capacitor shall be calculated: C (nF) = 30 + 200000 / (f x U_s) ..... :	_____nF	
	Verification of the drop out of the contactor when the switch is operated to the open position ..... :	-	N/A
9.3.3.2.2	**Relays and releases**		
8.2.1.3	a) Operation of under-voltage relays and releases		
	type of under-voltage relay ..... :	-	
	Rated control supply voltage(U)..... :	-	
	Frequency (Hz) ..... :	-	
	Limits of drop out and fully open at slowly falling voltage are 70 % and 35 % of the rated voltage..... :	-	N/A
	Prevent to close if supply voltage < 35 % of the rated voltage ..... :	-	N/A
	Limits of close satisfactorily at any value between 85 % and 110 % ..... :	-	N/A
8.2.1.4	b) Shunt-coil operated releases (shunt trip)		
	Tripping of shunt release measured during the tripping operation between 70 % and 110 % of the rated control supply voltage and if a.c. at rated frequency ..... :	-	N/A
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	**Common requirements**		
	type of time-delay overload relay ..... :	-	
	trip class ..... :	-	
	current setting ..... :	-	
	ambient temperature °C) ..... :	-	
	test enclosure W x H x D (mm x mm x mm) ..... :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	cable/busbar cross-section (mm²) / (mm) .....:	-	
	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 A overload relays, for ambient air temperature –5 °C or below, the manufacturer may declare a longer tripping time but not longer than 2 times the values required for 20 °C	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ambient temperature: + 20 C ..... :		
	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 ..... :		
	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

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Clause	Requirement + Test	Result - Remark	Verdict

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	-						—
	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
		-	-	-	-	-	-	
	b) when the value of the current flowing in two poles is increased to B times the current setting and the third pole deenergized, tripping shall occur in less than 2 h; current value; test current :	RT	S	RS	T	ST	R	N/A
		-	-	-	-	-	-	

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

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……. :	-	
	Accuracy ± 10% of the value……..:	-	N/A
8.2.1.5.4	**Limits of operation of under-current relays and releases for automatic change over**		
8.2.1.5.4.1	**e) Limits of operation under-current relays**		
	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
8.2.1.5.4.2	**f) Limits of operation of automatic change over by under-current relays**		
	- 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.	**g) 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

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	-	N/A
	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
	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		N/A
	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.	**h) 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	_____ s	N/A

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test current 95 % of set value	_____ A no trip	
	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 Test current 95 % of set value	_____ s _____ A no trip	N/A
	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
9.3.3.4	Test of dielectric properties, impulse withstand voltage (Uimp indicated):		
	- verification by measurement of clearances instead of testing	-	N/A
	Any actuator of insulating material and any integral non-metallic enclosure of equipment intended to be used without an additional enclosure shall be covered by a metal foil and connected to the frame or the mounting plate.	-	

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Tests are also carried out according Annex R of IEC 60947-1, Ed. 5, application of the metal foil for dielectric testing on accessible parts during operation or adjustment	-	N/A
	Terminal holes covered	☐ yes ☐ no	N/A
	- rated impulse withstand voltage (V) .....:	-	
	- test Uimp main circuits (kV) .....:	-	N/A
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	Test of dielectric properties, dielectric withstand voltage (Uimp not indicated):		
	- rated insulation voltage (V) .....:		
	- main circuits, test voltage for 5 s (V) .....:	-	N/A
	- control and auxiliary circuits, test voltage for 5-s (V) .....:	-	N/A
	- circuits of equipment include devices such as motors, instruments ect, test voltage for 5 s (V) ..:	-	N/A
	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.b	**TEST SEQUENCE II (#08,CJX2-4011)**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		
	Conditions, **make operations** only .....:		
	Type of product.....:	CJX2-4011	
	utilization category .....:	AC-3	
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4	Compliance	
	rated operational voltage Ue (V) :	380	
	rated operational current Ie (A) or power (kW) ....:	40A	
	- test voltage (V) U/Ue = 1,05.....:	L1:232 L2:232 L3:232	
	- test current (A) I/Ie = 10.....:	L1:410 L2:400 L3:415	
	- power factor/time constant .....:	L1:0,43 L2:0,43 L3:0,41	
	- on-time (ms) .....:	139~152	
	- off-time (s) .....:	10	
	- number of make operations .....:	50	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, **make/break operations** only.....:		
	Type of product.....:	CJX2-4011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	40A	
	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
	- test voltage (V) U/Ue = 1,05.....:	L1: 232 L2: 232 L3: 232	
	- test current (A)I/Ie = 8.....:	L1: 324 L2: 332 L3: 328	
	- power factor/time constant .....:	L1: 0,45 L2: 0,42 L3: 0,44	
	- on-time (ms) .....:	96~108	
	- off-time (s) .....:	40	
	- number of operations	☐ 50 make ☒ 50 make/break	
	Number of operation energized simultaneously	50	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	54,7	
	Measured oscillatory frequency (kHz) .....:	52,6	P
	Factor y .....:	1,10	P
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.6	Operational performance capability:		
	Type of product.....:	CJX2-4011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	40A	
	Conditions, make/break operations:		
	- test voltage (V) U/Ue = 1,05.....:	L1: 232 L2: 232 L3: 232	
	- test current (A) I/Ie = 2.....:	L1: 80,0 L2: 83,0 L3: 81,0	
	- power factor/time constant .....:	L1: 0,45 L2: 0,42 L3: 0,43	
	- on-time (ms) .....:	96~110	
	- off-time (s) .....:	10	
	- number of operations	☐ 6000 make ☒ 6000 make/ break	
	Number of operation energized simultaneously	6000	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	41,5	
	Measured oscillatory frequency (kHz) .....:	39,8	
	Factor y .....:	1,10	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P

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

8.3.3.4	Dielectric verification		
	test voltage (2 Ue), min 1000 V for 5 s. (V) .....:	U test:1000V	
	No flashover or breakdown	Compliance	P
8.3.3.5	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) .....:	-	N/A
	Leakage current: £ 2 mA /pole .....:	-	N/A

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

9.3.1.b	**TEST SEQUENCE II (#09,CJX2-4011)**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		
	Conditions, **make operations** only .....:		
	Type of product.....:	CJX2-4011	
	utilization category .....:	AC-3	
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4	Compliance	
	rated operational voltage Ue (V) :	660	
	rated operational current Ie (A) or power (kW) ....:	34A	
	- test voltage (V) U/Ue = 1,05.....:	L1:408 L2:408 L3:400	
	- test current (A) I/Ie = 10.....:	L1:348 L2:344 L3:344	
	- power factor/time constant .....:	L1:0,43 L2:0,43 L3:0,44	
	- on-time (ms) .....:	116~135	
	- off-time (s) .....:	10	
	- number of make operations .....:	50	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
	Conditions, **make/break operations** only.....:		

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Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-4011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660	
	rated operational current Ie (A) or power (kW) ....:	34A	
	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
	- test voltage (V) U/Ue = 1,05.....:	L1: 408 L2: 408 L3: 408	
	- test current (A)I/Ie = 8.....:	L1: 279 L2: 270 L3: 273	
	- power factor/time constant .....:	L1: 0,43 L2: 0,45 L3: 0,43	
	- on-time (ms) .....:	101~105	
	- off-time (s) .....:	30	
	- number of operations	☐ 50 make ☒ 50 make/ break	
	Number of operation energized simultaneously	50	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	34,1	
	Measured oscillatory frequency (kHz) .....:	32,3	P
	Factor y .....:	1,07	P
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
9.3.3.6	Operational performance capability:		

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Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-4011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660	
	rated operational current Ie (A) or power (kW) ....:	34A	
	Conditions, make/break operations:		
	- test voltage (V) U/Ue = 1,05.....:	L1: 408 L2: 408 L3: 408	
	- test current (A) I/Ie = 2.....:	L1: 71,0 L2: 71,0 L3: 71,5	
	- power factor/time constant .....:	L1: 0,41 L2: 0,41 L3: 0,42	
	- on-time (ms) .....:	96~102	
	- off-time (s) .....:	10	
	- number of operations	☐ 6000 make ☒ 6000 make/ break	
	Number of operation energized simultaneously	6000	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	25,8	
	Measured oscillatory frequency (kHz) .....:	24,7	
	Factor y .....:	1,13	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
8.3.3.4	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ue), min 1000 V for 5 s. (V) .....:	U_{test}:1,32kV(main circuits),1,00kV(control and auxiliary circuits)	
	No flashover or breakdown	Compliance	P
8.3.3.5	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) .....:	-	
	Leakage current: £ 2 mA /pole .....:	-	N/A

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

9.3.1.b	**TEST SEQUENCE II (#10,CJX2-5011)**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		
	Conditions, **make operations** only .....:		
	Type of product.....:	CJX2-5011	
	utilization category .....:	AC-3	
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4	Compliance	
	rated operational voltage Ue (V) :	380	
	rated operational current Ie (A) or power (kW) ....:	50A	
	- test voltage (V) U/Ue = 1,05.....:	L1:232 L2:232 L3:232	
	- test current (A) I/Ie = 10.....:	L1:510 L2:510 L3:510	
	- power factor/time constant .....:	L1:0,44 L2:0,44 L3:0,43	
	- on-time (ms) .....:	118~157	
	- off-time (s) .....:	10	
	- number of make operations .....:	50	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditions, **make/break operations** only.....:		
	Type of product.....:	CJX2-5011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	50A	
	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
	- test voltage (V) U/Ue = 1,05.....:	L1: 232 L2: 232 L3: 232	
	- test current (A)I/Ie = 8.....:	L1: 410 L2: 400 L3: 415	
	- power factor/time constant .....:	L1: 0,43 L2: 0,43 L3: 0,41	
	- on-time (ms) .....:	95~102	
	- off-time (s) .....:	40	
	- number of operations	☐ 50 make ☒ 50 make/break	
	Number of operation energized simultaneously	50	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	57,2	
	Measured oscillatory frequency (kHz) .....:	54,9	P
	Factor y .....:	1,12	P
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.3.3.6	Operational performance capability:		
	Type of product.....:	CJX2-5011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	50A	
	Conditions, make/break operations:		
	- test voltage (V) U/Ue = 1,05.....:	L1: 232 L2: 232 L3: 232	
	- test current (A) I/Ie = 2.....:	L1: 100 L2: 100 L3: 100	
	- power factor/time constant .....:	L1: 0,41 L2: 0,41 L3: 0,41	
	- on-time (ms) .....:	97~100	
	- off-time (s) .....:	10	
	- number of operations	☐ 6000 make ☒ 6000 make/ break	
	Number of operation energized simultaneously	6000	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	43,4	
	Measured oscillatory frequency (kHz) .....:	41,5	
	Factor y .....:	1,13	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P

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

8.3.3.4	Dielectric verification		
	test voltage (2 Ue), min 1000 V for 5 s. (V) .....:	U test:1000V	
	No flashover or breakdown	Compliance	P
8.3.3.5	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) .....:	-	
	Leakage current: £ 2 mA /pole .....:	-	N/A

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

9.3.1.b	**TEST SEQUENCE II (#11,CJX2-5011)**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		
	Conditions, **make operations** only .....:		
	Type of product.....:	CJX2-5011	
	utilization category .....:	AC-3	
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4	Compliance	
	rated operational voltage Ue (V) :	660	
	rated operational current Ie (A) or power (kW) ....:	39A	
	- test voltage (V) U/Ue = 1,05.....:	L1:408 L2:408 L3:408	
	- test current (A) I/Ie = 10.....:	L1:390 L2:395 L3:390	
	- power factor/time constant .....:	L1:0,42 L2:0,41 L3:0,43	
	- on-time (ms) .....:	121~214	
	- off-time (s) .....:	10	
	- number of make operations .....:	50	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
	Conditions, **make/break operations** only.....:		

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Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-5011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660	
	rated operational current Ie (A) or power (kW) ....:	39A	
	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
	- test voltage (V) U/Ue = 1,05.....:	L1: 408 L2: 408 L3: 404	
	- test current (A)I/Ie = 8.....:	L1: 320 L2: 320 L3: 320	
	- power factor/time constant .....:	L1: 0,47 L2: 0,46 L3: 0,47	
	- on-time (ms) .....:	94~107	
	- off-time (s) .....:	40	
	- number of operations	☐ 50 make ☒ 50 make/ break	
	Number of operation energized simultaneously	50	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	35,0	
	Measured oscillatory frequency (kHz) .....:	33,3	P
	Factor y .....:	1,08	P
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
9.3.3.6	Operational performance capability:		

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Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-5011	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660	
	rated operational current Ie (A) or power (kW) ....:	39A	
	Conditions, make/break operations:		
	- test voltage (V) U/Ue = 1,05.....:	L1: 404 L2: 404 L3: 404	
	- test current (A) I/Ie = 2.....:	L1: 80,0 L2: 80,0 L3: 79,0	
	- power factor/time constant .....:	L1: 0,42 L2: 0,43 L3: 0,44	
	- on-time (ms) .....:	96~104	
	- off-time (s) .....:	10	
	- number of operations	☐ 6000 make ☒ 6000 make/ break	
	Number of operation energized simultaneously	6000	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	26,5	
	Measured oscillatory frequency (kHz) .....:	25,4	
	Factor y .....:	1,08	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
8.3.3.4	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ue), min 1000 V for 5 s. (V) .....:	U_{test}:1,32kV(main circuits),1,00kV(control and auxiliary circuits)	
	No flashover or breakdown	Compliance	P
8.3.3.5	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) .....:	-	
	Leakage current: £ 2 mA /pole .....:	-	N/A

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

9.3.1.b	**TEST SEQUENCE II (#12,CJX2-6311)**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		
	Conditions, **make operations** only .....:		
	Type of product.....:	CJX2-6311	
	utilization category .....:	AC-3	
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4	Compliance	
	rated operational voltage Ue (V) :	380	
	rated operational current Ie (A) or power (kW) ....:	63A	
	- test voltage (V) U/Ue = 1,05.....:	L1:234 L2:234 L3:234	
	- test current (A) I/Ie = 10.....:	L1:651 L2:658 L3:644	
	- power factor/time constant .....:	L1:0,44 L2:0,43 L3:0,44	
	- on-time (ms) .....:	118~141	
	- off-time (s) .....:	10	
	- number of make operations .....:	50	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
	Conditions, **make/break operations** only.....:		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-6311	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	63A	
	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
	- test voltage (V) U/Ue = 1,05.....:	L1: 232 L2: 232 L3: 232	
	- test current (A)I/Ie = 8.....:	L1: 510 L2: 510 L3: 510	
	- power factor/time constant .....:	L1: 0,44 L2: 0,44 L3: 0,43	
	- on-time (ms) .....:	99~112	
	- off-time (s) .....:	60	
	- number of operations	☐ 50 make ☒ 50 make/break	
	Number of operation energized simultaneously	50	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	59,9	
	Measured oscillatory frequency (kHz) .....:	57,4	P
	Factor y .....:	1,09	P
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
9.3.3.6	Operational performance capability:		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-6311	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	63A	
	Conditions, make/break operations:		
	- test voltage (V) U/Ue = 1,05.....:	L1: 232 L2: 232 L3: 232	
	- test current (A) I/Ie = 2.....:	L1: 125 L2: 126 L3: 126	
	- power factor/time constant .....:	L1: 0,47 L2: 0,48 L3: 0,47	
	- on-time (ms) .....:	97~108	
	- off-time (s) .....:	20	
	- number of operations	☐ 6000 make ☒ 6000 make/ break	
	Number of operation energized simultaneously	6000	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	45,4	
	Measured oscillatory frequency (kHz) .....:	43,4	
	Factor y .....:	1,11	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
8.3.3.4	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ue), min 1000 V for 5 s. (V) .....:	U test:1000V	
	No flashover or breakdown	Compliance	P
8.3.3.5	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) .....:	-	
	Leakage current: £ 2 mA /pole .....:	-	N/A

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

9.3.1.b	**TEST SEQUENCE II (#13,CJX2-6311)**		
	Verification of rated making and breaking capacities, change-over ability and reversibility, where applicable (Clause 9.3.3.5.)		**P**
	- verification of conventional operational performance (Clause 9.3.3.6)		**P**
9.3.3.5	**Making and breaking capacity**		
	Conditions, **make operations** only .....:		
	Type of product.....:	CJX2-6311	
	utilization category .....:	AC-3	
	Control voltage 25 times at 110% and 25 times at 85% for AC-3 and AC-4	Compliance	
	rated operational voltage Ue (V) :	660	
	rated operational current Ie (A) or power (kW) ....:	42A	
	- test voltage (V) U/Ue = 1,05.....:	L1:404 L2:404 L3:404	
	- test current (A) I/Ie = 10.....:	L1:426 L2:426 L3:426	
	- power factor/time constant .....:	L1:0,42 L2:0,42 L3:0,42	
	- on-time (ms) .....:	128~147	
	- off-time (s) .....:	10	
	- number of make operations .....:	50	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
	Conditions, **make/break operations** only.....:		

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Clause	Requirement + Test	Result - Remark	Verdict

	Type of product.....:	CJX2-6311	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660	
	rated operational current Ie (A) or power (kW) ....:	42A	
	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
	- test voltage (V) U/Ue = 1,05.....:	L1: 408 L2: 408 L3: 404	
	- test current (A)I/Ie = 8.....:	L1: 348 L2: 344 L3: 344	
	- power factor/time constant .....:	L1: 0,43 L2: 0,42 L3: 0,44	
	- on-time (ms) .....:	97~103	
	- off-time (s) .....:	40	
	- number of operations	☐ 50 make ☒ 50 make/ break	
	Number of operation energized simultaneously	50	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	35,5	
	Measured oscillatory frequency (kHz) .....:	33,8	P
	Factor y .....:	1,11	P
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
9.3.3.6	Operational performance capability:		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Type of product.....:	CJX2-6311	
	utilization category .....:	AC-3	
	rated operational voltage Ue (V) .....:	660	
	rated operational current Ie (A) or power (kW) ....:	42A	
	Conditions, make/break operations:		
	- test voltage (V) U/Ue = 1,05.....:	L1: 404 L2: 404 L3: 404	
	- test current (A) I/Ie = 2.....:	L1: 84,0 L2: 84,0 L3: 84,5	
	- power factor/time constant .....:	L1: 0,40 L2: 0,41 L3: 0,41	
	- on-time (ms) .....:	102~109	
	- off-time (s) .....:	10	
	- number of operations	☐ 6000 make ☒ 6000 make/ break	
	Number of operation energized simultaneously	6000	
	Characteristic of transient recovery voltage for AC-3 and AC-4 only:		
	oscillatory frequency (kHz) .....:	26,9	
	Measured oscillatory frequency (kHz) .....:	25,7	
	Factor y .....:	1,09	
	Behaviour and condition during and after the test:		
	- no permanent arcing	Compliance	P
	- no flash-over between poles	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	- no welding of the contacts	Compliance	P
	- the contacts shall operate when the contactor or starter is switched by the applicable method of control	Compliance	P
8.3.3.4	Dielectric verification		

IEC 60947-4-1			
Clause	Requirement + Test	Result - Remark	Verdict
	test voltage (2 Ue), min 1000 V for 5 s. (V) .....:	U_{test}:1,32kV(main circuits),1,00kV(control and auxiliary circuits)	
	No flashover or breakdown	Compliance	P
8.3.3.5	Leakage current equipment suitable for isolation		
	test voltage (1,1 Ue) (V) .....:	-	
	Leakage current: £ 2 mA /pole .....:	-	N/A

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

9.3.1.c	**TEST SEQUENCE III (#14,CJX2-4011)**		
	- Performance under short-circuit conditions (Clause 9.3.4)		**P**
9.3.4	Performance under short-circuit conditions		
	Contactors or starter and the associated SCPD, or combination or protected starter are subjected to tests 9.3.4.2.1 and 9.3.4.2.2.	Compliance	P
	Maximum Ie and maximum Ue for AC-3 are covered	Compliance	P
	Sub clause 8.3.4.1.2 of part 1 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 ____	N/A
	Rated control supply voltage .....:	380V	P
9.3.4.2.1	Test at the prospective current "r":		
	type of product .....:	CJX2-4011	
	test circuit, figure 9, 10, 11, 12.....:	Figure 11	
	type of SCPD .....:	RT16-80	
	ratings of SCPD, co-ordination type 1 .....:	-	
	ratings of SCPD, co-ordination type 2 .....:	500V/80A	
	rated operational current Ie (A) AC-3 .....:	34	
	rated operational voltage (V) .....:	660	
	prospective current "r" (kA) (table 12) .....:	3	
	Wire size (mm^2) type 1	-	N/A
	Wire size (mm^2) type 2	10 mm^2	P
	test voltage (V) .....:	L1: 420 L2: 421 L3: 419	
	r.m.s. test current (kA) .....:	L1: 3,05 L2: 3,09 L3: 3,07	

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Clause	Requirement + Test	Result - Remark	Verdict
	peak current (kA) .....:	L1: 4,28 L2: 4,35 L3: 4,33	
	power factor	L1:0,89 L2:0,89 L3:0,89	P
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I²dt and Ip (kA²s / kA) .....:	L1: 8,89/1,76 L2: 10,1/2,20 L3: 13,0/1,88	
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I²dt and Ip (kA²s / kA)	L1: 18,6/1,83 L2: 20,1/2,39 L3: 18,1/2,61	
9.3.4.2.3	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	Compliance	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	-	N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals	Compliance	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	Compliance	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
	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:	-	
	a) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) 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 may be inoperative after each operation. The starter shall there fore 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 contctor/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:	-	
	I - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V .....:	U test: _____ V	
	- 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	Utest: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	
	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 is permitted, if they are easily separated (e.g. by a screwdriver) 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.	Contacts welded ☐ yes ☒ no	P

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Clause	Requirement + Test	Result - Remark	Verdict
	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 8 for the applicable utilization category.	-	N/A
	Operational performance capability (9.3.3.6):	-	
	Type of product :	-	
	utilization category :	-	
	rated operational voltage Ue (V) :	-	
	rated operational current Ie (A) or power (kW) :	-	
	Conditions, make/break operations:	-	
	- test voltage U/Ue = 1,05 (V) :	-	
	- test current (A) I/Ie = 6 :	-	
	- power factor/time constant :	-	
	- on-time (ms) :	-	
	- off-time (s) :	-	
	- number of make/break operations :	-	
	Characteristic of transient recovery voltage for AC-3 and AC-4 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
9.3.4.2.3	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:	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict

	L - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V :	U_{test}:1,32kV(main circuits),1,00kV(control and auxiliary circuits)	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	Compliance	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	Compliance	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	Compliance	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 5 s (V)	U test: _____ 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		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	U test: _____ V L1: _____ mA L1: _____ mA L1: _____ mA	N/A

9.3.4.2.2	Test at the rated conditional short-circuit current "Iq"(#17,CJX2-4011)		
	Type of product.....:	CJX2-4011	
	Test circuit, figure 9, 10, 11, 12 .....:	11	
	type of SCPD .....:	RT16-80	
	ratings of SCPD, co-ordination type 1 .....:	-	
	ratings of SCPD, co-ordination type 2 .....:	500V/80A	
	rated operational current Ie (A) AC-3 .....:	34	
	rated operational voltage (V)	660	
	prospective current "Iq" (kA) .....:	50	

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Clause	Requirement + Test	Result - Remark	Verdict
	Wire size (mm^2) type 1	-	N/A
	Wire size (mm^2) type 2	10	P
	test voltage (V) .....:	L1: 419 L2: 420 L3: 419	
	r.m.s. test current (A) .....:	L1: 53,6 L2: 49,7 L3: 48,5	
	peak current (A) .....:	L1: 106 L2: 104 L3: 101	
	power factor	0,23	
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I²t and Ip (kA²s / kA) .....:	L1: 33,8/3,97 L2: 41,6/7,03 L3: 25,1/3,38	
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I²t and Ip (kA²s / kA) .....:	L1: 35,6/6,41 L2: 37,7/3,83 L3: 23,3/5,78	
	3. one breaking operation of SCPD by closing the switching device on to the short-circuit I²t and Ip (kA²s / kA) .....:	L1: - L2: - L3: -	
	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	Compliance	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	-	N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals	Compliance	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	Compliance	P
	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:	-	
	a) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current	-	N/A
	b) 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 may be inoperative after each operation. The starter shall there fore 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:	-	
	I - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V .....:	U test: _____ V	
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	Utest: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	
	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 is permitted, if they are easily separated (e.g. by a screwdriver) 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.	Contacts welded ☐ yes ☒ no	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 8 for the applicable utilization category.	-	N/A
	Operational performance capability (9.3.3.6):	-	
	Type of product :	-	
	utilization category :	-	
	rated operational voltage Ue (V) :	-	
	rated operational current Ie (A) or power (kW) :	-	
	Conditions, make/break operations:	-	
	- test voltage U/Ue = 1,05 (V) :	-	
	- test current (A) I/Ie = ___ :	-	
	- power factor/time constant :	-	
	- on-time (ms) :	-	
	- off-time (s) :	-	
	- number of make/break operations :	-	
	Characteristic of transient recovery voltage for AC-3 and AC-4 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
9.3.4.2.3	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:	Compliance	P
	L - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V :	U test: 1,32kV(main circuits),1,00kV(control and auxiliary circuits)	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	Compliance	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	Compliance	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	Compliance	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 5 s (V)	U test: _____ 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	-	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	U test: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.c	**TEST SEQUENCE III (#15,CJX2-5011)**		
	- Performance under short-circuit conditions (Clause 9.3.4)		**P**
9.3.4	Performance under short-circuit conditions		
	Contactors or starter and the associated SCPD, or combination or protected starter are subjected to tests 9.3.4.2.1 and 9.3.4.2.2.	Compliance	P
	Maximum Ie and maximum Ue for AC-3 are covered	Compliance	P
	Sub clause 8.3.4.1.2 of part 1 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 ____	N/A
	Rated control supply voltage .....:	380V	P
9.3.4.2.1	Test at the prospective current "r":		
	type of product .....:	CJX2-5011	
	test circuit, figure 9, 10, 11, 12.....:	Figure 11	
	type of SCPD .....:	RT16-80	
	ratings of SCPD, co-ordination type 1 .....:	-	
	ratings of SCPD, co-ordination type 2 .....:	500V/80A	
	rated operational current Ie (A) AC-3 .....:	39	
	rated operational voltage (V) .....:	660	
	prospective current "r" (kA) (table 12) .....:	3	
	Wire size (mm^2) type 1	-	N/A
	Wire size (mm^2) type 2	10 mm^2	P
	test voltage (V) .....:	L1: 420 L2: 421 L3: 419	
	r.m.s. test current (kA) .....:	L1: 3,05 L2: 3,09 L3: 3,07	

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Clause	Requirement + Test	Result - Remark	Verdict
	peak current (kA) .....:	L1: 4,28 L2: 4,35 L3: 4,33	
	power factor	L1:0,89 L2:0,89 L3:0,89	P
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I²dt and Ip (kA²s / kA) .....:	L1: 4,35/1,54 L2: 3,00/1,39 L3: 3,99/1,73	
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I²dt and Ip (kA²s / kA)	L1: 3,11/1,50 L2: 3,34/1,36 L3: 7,64/2,30	
9.3.4.2.3	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	Compliance	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	-	N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals	Compliance	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	Compliance	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
	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:	-	
	a) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) 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 may be inoperative after each operation. The starter shall there fore 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 contctor/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:	-	
	I - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V .....:	U test: _____ V	
	- 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	Utest: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	
	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 is permitted, if they are easily separated (e.g. by a screwdriver) 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.	Contacts welded ☐ yes ☒ no	P

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Clause	Requirement + Test	Result - Remark	Verdict
	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 8 for the applicable utilization category.	-	N/A
	Operational performance capability (9.3.3.6):	-	
	Type of product :	-	
	utilization category :	-	
	rated operational voltage Ue (V) :	-	
	rated operational current Ie (A) or power (kW) :	-	
	Conditions, make/break operations:	-	
	- test voltage U/Ue = 1,05 (V) :	-	
	- test current (A) I/Ie = 6 :	-	
	- power factor/time constant :	-	
	- on-time (ms) :	-	
	- off-time (s) :	-	
	- number of make/break operations :	-	
	Characteristic of transient recovery voltage for AC-3 and AC-4 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
9.3.4.2.3	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:	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict

	L - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V :	U_{test}:1,32kV(main circuits),1,00kV(control and auxiliary circuits)	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	Compliance	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	Compliance	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	Compliance	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 5 s (V)	U test: _____ 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		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	U test: _____ V L1: _____ mA L1: _____ mA L1: _____ mA	N/A

9.3.4.2.2	Test at the rated conditional short-circuit current "Iq"(#18,CJX2-5011)		
	Type of product.....:	CJX2-5011	
	Test circuit, figure 9, 10, 11, 12 .....:	11	
	type of SCPD .....:	RT16-80	
	ratings of SCPD, co-ordination type 1 .....:	-	
	ratings of SCPD, co-ordination type 2 .....:	500V/80A	
	rated operational current Ie (A) AC-3 .....:	39	
	rated operational voltage (V)	660	
	prospective current "Iq" (kA) .....:	50	

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Clause	Requirement + Test	Result - Remark	Verdict
	Wire size (mm^2) type 1	-	N/A
	Wire size (mm^2) type 2	10	P
	test voltage (V) .....:	L1: 419 L2: 420 L3: 419	
	r.m.s. test current (A) .....:	L1: 53,6 L2: 49,7 L3: 48,5	
	peak current (A) .....:	L1: 106 L2: 104 L3: 101	
	power factor	0,23	
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I²t and Ip (kA²s / kA) .....:	L1: 36,7/5,67 L2: 28,0/6,86 L3: 17,4/2,73	
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I²t and Ip (kA²s / kA) .....:	L1: 102/7,72 L2: 22,2/5,41 L3: 12,3/1,53	
	3. one breaking operation of SCPD by closing the switching device on to the short-circuit I²t and Ip (kA²s / kA) .....:	L1: - L2: - L3: -	
	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	Compliance	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	-	N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals	Compliance	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	Compliance	P
	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:	-	
	a) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current	-	N/A
	b) 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 may be inoperative after each operation. The starter shall there fore 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:	-	
	I - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V .....:	U test: _____ V	
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	Utest: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	
	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 is permitted, if they are easily separated (e.g. by a screwdriver) 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.	Contacts welded ☐ yes ☒ no	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 8 for the applicable utilization category.	-	N/A
	Operational performance capability (9.3.3.6):	-	
	Type of product :	-	
	utilization category :	-	
	rated operational voltage Ue (V) :	-	
	rated operational current Ie (A) or power (kW) :	-	
	Conditions, make/break operations:	-	
	- test voltage U/Ue = 1,05 (V) :	-	
	- test current (A) I/Ie = ___ :	-	
	- power factor/time constant :	-	
	- on-time (ms) :	-	
	- off-time (s) :	-	
	- number of make/break operations :	-	
	Characteristic of transient recovery voltage for AC-3 and AC-4 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
9.3.4.2.3	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:	Compliance	P
	L - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V :	U test: 1,32kV(main circuits),1,00kV(control and auxiliary circuits)	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	Compliance	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	Compliance	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	Compliance	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 5 s (V)	U test: _____ 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	-	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	U test: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.c	**TEST SEQUENCE III (#16,CJX2-6311)**		
	- Performance under short-circuit conditions (Clause 9.3.4)		**P**
9.3.4	Performance under short-circuit conditions		
	Contactors or starter and the associated SCPD, or combination or protected starter are subjected to tests 9.3.4.2.1 and 9.3.4.2.2.	Compliance	P
	Maximum Ie and maximum Ue for AC-3 are covered	Compliance	P
	Sub clause 8.3.4.1.2 of part 1 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 ____	N/A
	Rated control supply voltage .....:	380V	P
9.3.4.2.1	Test at the prospective current "r":		
	type of product .....:	CJX2-6311	
	test circuit, figure 9, 10, 11, 12.....:	Figure 11	
	type of SCPD .....:	RT16-80	
	ratings of SCPD, co-ordination type 1 .....:	-	
	ratings of SCPD, co-ordination type 2 .....:	500V/80A	
	rated operational current Ie (A) AC-3 .....:	42	
	rated operational voltage (V) .....:	660	
	prospective current "r" (kA) (table 12) .....:	3	
	Wire size (mm^2) type 1	-	N/A
	Wire size (mm^2) type 2	10 mm^2	P
	test voltage (V) .....:	L1: 420 L2: 421 L3: 419	
	r.m.s. test current (kA) .....:	L1: 3,05 L2: 3,09 L3: 3,07	
	peak current (kA) .....:	L1: 4,28 L2: 4,35 L3: 4,33	

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Clause	Requirement + Test	Result - Remark	Verdict
	power factor	L1:0,89 L2:0,89 L3:0,89	P
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I²dt and Ip (kA²s / kA) .....:	L1: 7,62/1,92 L2: 5,09/2,02 L3: 8,47/1,86	
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I²dt and Ip (kA²s / kA)	L1: 5,60/1,76 L2: 8,00/2,19 L3: 6,31/2,13	
9.3.4.2.3	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	Compliance	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	-	N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals	Compliance	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	Compliance	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
	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:	-	
	a) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current	-	N/A
	b) 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):		

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Clause	Requirement + Test	Result - Remark	Verdict
	H - there has been no discharge of parts beyond the enclosure. Damage to the contactor and the overload relay is acceptable. The starter may be inoperative after each operation. The starter shall there fore 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 contctor/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:	-	
	I - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V .....:	U test: _____ V	
	- 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	Utest: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	
	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 is permitted, if they are easily separated (e.g. by a screwdriver) 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.	Contacts welded ☐ yes ☒ no	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 8 for the applicable utilization category.	-	N/A
	Operational performance capability (9.3.3.6):		
	Type of product :	-	

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Clause	Requirement + Test	Result - Remark	Verdict
	utilization category :	-	
	rated operational voltage Ue (V) :	-	
	rated operational current Ie (A) or power (kW) :	-	
	Conditions, make/break operations:	-	
	- test voltage U/Ue = 1,05 (V) :	-	
	- test current (A) I/Ie = 6 :	-	
	- power factor/time constant :	-	
	- on-time (ms) :	-	
	- off-time (s) :	-	
	- number of make/break operations :	-	
	Characteristic of transient recovery voltage for AC-3 and AC-4 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
9.3.4.2.3	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:	Compliance	P
	L - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V :	U_{test}:1,32kV(main circuits),1,00kV(control and auxiliary circuits)	P
	- between all the terminals of the main circuit connected together (including the control and	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict

	auxiliary circuits connected to the main circuit) and the enclosure or mounting plate, with the contacts in all normal positions of operation		
	- 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	Compliance	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	Compliance	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 5 s (V)	U test: _____ 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		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	U test: _____ V L1: _____ mA L1: _____ mA L1: _____ mA	N/A

9.3.4.2.2	Test at the rated conditional short-circuit current "Iq"(#19,CJX2-6311)		
	Type of product.....:	CJX2-6311	
	Test circuit, figure 9, 10, 11, 12 .....:	11	
	type of SCPD .....:	RT16-80	
	ratings of SCPD, co-ordination type 1 .....:	-	
	ratings of SCPD, co-ordination type 2 .....:	500V/80A	
	rated operational current Ie (A) AC-3 .....:	42	
	rated operational voltage (V)	660	
	prospective current "Iq" (kA) .....:	50	
	Wire size (mm^2) type 1	-	N/A
	Wire size (mm^2) type 2	10	P
	test voltage (V) .....:	L1: 419 L2: 420 L3: 419	

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Clause	Requirement + Test	Result - Remark	Verdict
	r.m.s. test current (A) .....:	L1: 53,6 L2: 49,7 L3: 48,5	
	peak current (A) .....:	L1: 106 L2: 104 L3: 101	
	power factor	0,23	
	1. one breaking operation of SCPD with all the switching devices closed prior to the test I²t and Ip (kA²s / kA) .....:	L1: 34,9/6,95 L2: 15,1/2,71 L3: 26,1/4,65	
	2. one breaking operation of SCPD by closing the contactor or starter on to the short-circuit I²t and Ip (kA²s / kA) .....:	L1: 90,8/6,70 L2: 27,6/5,89 L3: 15,9/2,82	
	3. one breaking operation of SCPD by closing the switching device on to the short-circuit I²t and Ip (kA²s / kA) .....:	L1: - L2: - L3: -	
	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	Compliance	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	-	N/A
	C - there is no damage to the conductors or terminals and the conductors have not been separated from the terminals	Compliance	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	Compliance	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:	-	
	a) circuit breaker with instantaneous trip relays or releases, at 120% of the trip current	-	N/A
	b) 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 may be inoperative after each operation. The starter shall there fore 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:	-	
	I - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V .....:	U test: _____ V	
	- 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	Utest: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	
	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 is permitted, if they are easily separated (e.g. by a screwdriver) 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.	Contacts welded ☐ yes ☒ no	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 8 for the applicable utilization category.	-	N/A
	Operational performance capability (9.3.3.6):	-	
	Type of product :	-	
	utilization category :	-	
	rated operational voltage Ue (V) :	-	
	rated operational current Ie (A) or power (kW) :	-	
	Conditions, make/break operations:	-	
	- test voltage U/Ue = 1,05 (V) :	-	
	- test current (A) I/Ie = ___ :	-	
	- power factor/time constant :	-	
	- on-time (ms) :	-	
	- off-time (s) :	-	
	- number of make/break operations :	-	
	Characteristic of transient recovery voltage for AC-3 and AC-4 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
9.3.4.2.3	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:	Compliance	P
	L - dielectric verification test voltage (2 Ue) for 5 s (V) but not less than 1000V :	U test: 1,32kV(main circuits),1,00kV(control and auxiliary circuits)	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	Compliance	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	Compliance	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	Compliance	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 5 s (V)	U test: _____ 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	-	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	U test: _____ V L1: _____ mA L2: _____ mA L3: _____ mA	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.d	**TEST SEQUENCE IV(#20,CJX2-4011)**	

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

9.3.5	Verification of ability to withstand overload currents		
	Overload current withstand capability of contactors AC-3 and AC-4:		
	ambient temperature (C) .....:	29	
	rated operational current Ie (A) max. AC-3 .....:	40	
	test current (Ie) (A) .....:	320	
	duration of test: 10 s .....:	10s	
	After the test, the contactor shall be substantially in the same condition as before the test (visual inspection)	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.d	**TEST SEQUENCE IV(#21,CJX2-5011)**	

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

9.3.5	Verification of ability to withstand overload currents		
	Overload current withstand capability of contactors AC-3 and AC-4:		
	ambient temperature (C) .....:	29	
	rated operational current Ie (A) max. AC-3 .....:	50	
	test current (Ie) (A) .....:	400	
	duration of test: 10 s .....:	10s	
	After the test, the contactor shall be substantially in the same condition as before the test (visual inspection)	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict

9.3.1.d	**TEST SEQUENCE IV(#22,CJX2-6311)**	

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

9.3.5	Verification of ability to withstand overload currents		
	Overload current withstand capability of contactors AC-3 and AC-4:		
	ambient temperature (C) .....:	29	
	rated operational current Ie (A) max. AC-3 .....:	63	
	test current (Ie) (A) .....:	504	
	duration of test: 10 s .....:	10s	
	After the test, the contactor shall be substantially in the same condition as before the test (visual inspection)	Compliance	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.1.e	**TEST SEQUENCE V(#23,CJX2-6311,meeting the requirement of CJX2-4011, CJX2-5011)**		
	- Verification of mechanical properties of terminals: Clause 8.2.4 **- Verification of degrees of protection of enclosed contactors and starters (see annex C of part 1)**		**P** **N/A**
8.2.4 part 1	Verification of mechanical properties of terminals		
		See construction	P
Annex C Part 1	Verification of degrees of protection of enclosed contactors and starters		
		See construction	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	EMC tests		
	Sub. Clause 8.3.2.1, 8.3.2.3 and 8.3.2.4 of part 1 apply	-	**N/A**
	In agreement with the manufacturer one EMC test or all EMC may conducted on one sample	-	**N/A**
	The test sample shall be in the open or closed position, whichever is the worse, and shall be operated with the rated supply.	-	**N/A**
9.4	**ELECTROMAGNETIC COMPATIBILITY TESTS**		**N/A**
	TEST SEQUENCE Annex B		**N/A**
	- **Mechanical durability B2** **Single 8 test** **Double 3 test** **- Electrical durability B3**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE Annex F		**P**
	Requirements for auxiliary contact linked with power contact (mirror contact)		**P**
		See Attachment 1	P
	(sample No.#30~#32,CJX2-6311)		
F 7.2 a)	Contact	Compliance	P
F 7.2 a)	Contacts kept in closed position by	Welding	P
	Measurement method	b1)	P
Table F.1	Test voltage (kV)	2,5	P
	Type of products:	CJX2-6311	P
	With contact 21-22	Compliance	P
	with	-	N/A
	(sample No.#08~#09, CJX2-4011;#10~#11,CJX2-5011;#12~#13,CJX2-6311)		
F 7.3	Test after conventional operational performance	Compliance	P
	With contact 21-22	Compliance	P
	with	-	N/A

	TEST SEQUENCE Annex H	**N/A**
	Extended functions within electronic overload relays	

	TEST SEQUENCE Annex K		**N/A**
	Procedure to determine data for electromechanical contactors used in functional safety applications.		**N/A**
		See	N/A

	TEST SEQUENCE Annex M (part 1)	**N/A**
	Hot wire ignition (HWI) test	

9.1.5.2	**TEST SEQUENCE Special tests – damp heat, salt mist, vibration and shock**	**N/A**

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	Flame tests according IEC 60695-11-10		**N/A**
	Test method A		
a)			
b)			
c)			
d)			
e)			
f)			
g)			
h)			
i)			
j)			
k)			
l)			
m)			
n)	☐ **HB** ☐ **HB40** ☐ **HB 75**		
	Flame tests according IEC 60695-11-10		
	Test method B		
a)			
b)			
c)			
d)			
e)			
f)			
g)			
h)			
i)			
j)			
k)			
l)			
m)			
n)	☐ **V-0** ☐ **V-1** ☐ **V-2**		

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9.3.3.3	**TABLE: Heating Test** (#01,CJX2-6311, Test sequence 1)		P
	Test voltage (V) ..... :	-	
	Ambient (^{o}C) .....:	30	

Thermocouple Locations	max. temperature rise measured,(K)	max. temperature rise limit, (K)
LINE L1	61,8	65
LINE L2	62,5	65
LINE L3	60,6	65
LOAD L1	60,4	65
LOAD L2	61,7	65
LOAD L3	61,5	65
Parts which need not be touched during normal operation: metallic	34,6	40
Parts which need not be touched during normal operation: non-metallic	30,2	50
Control circuit terminal A1	28,7	65
Control circuit terminal A2	29,5	65
Auxiliary circuit terminal 13	28,5	65
Auxiliary circuit terminal 14	29,2	65
supplementary information: None		

9.3.3.3.6a	**TABLE: Heating test, resistance method**					P
	Test voltage (V) ..... :		380			
	Ambient, t_1 (C) .....:		30			
	Ambient, t_2 (C) .....:		30			

Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class
Winding	331,5	402,8	55,7	110	B
supplementary information: None					

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9.3.3.3.6b	**TABLE: Heating test, resistance method**					P
	Test voltage (V) ..... :		380			
	Ambient, t_1 (C) ..... :		30			
	Ambient, t_2 (C) ..... :		30			
Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class	
Winding	331,5	371,1	30,6	110	B	
supplementary information: None						

9.3.3.3	**TABLE: Heating Test** (#02,CJX2-5011, Test sequence 1)		P
	Test voltage (V) ..... :	-	
	Ambient (^{o}C) ..... :	30	
Thermocouple Locations	max. temperature rise measured,(K)	max. temperature rise limit, (K)	
LINE L1	62,8	65	
LINE L2	63,7	65	
LINE L3	63,4	65	
LOAD L1	61,8	65	
LOAD L2	63,6	65	
LOAD L3	63,2	65	
Parts which need not be touched during normal operation: metallic	35,7	40	
Parts which need not be touched during normal operation: non-metallic	32,8	50	
Control circuit terminal A1	30,2	65	
Control circuit terminal A2	31,3	65	
Auxiliary circuit terminal 13	31,5	65	
Auxiliary circuit terminal 14	32,2	65	
supplementary information: None			

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9.3.3.3.6a	**TABLE: Heating test, resistance method**					P
	Test voltage (V) ..... :			380		
	Ambient, t_1 (C) .....:			30		
	Ambient, t_2 (C) .....:			30		
Temperature rise of winding		R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class
Winding		332,8	408,5	59,1	110	B
supplementary information: None						

9.3.3.3.6b	**TABLE: Heating test, resistance method**					P
	Test voltage (V) ..... :			380		
	Ambient, t_1 (C) .....:			30		
	Ambient, t_2 (C) .....:			30		
Temperature rise of winding		R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class
Winding		332,8	373,6	31,4	110	B
supplementary information: None						

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9.3.3.3	**TABLE: Heating Test** (#03,CJX2-4011, Test sequence 1)		P
	Test voltage (V) ..... :	-	
	Ambient (^{o}C) .....:	30	

Thermocouple Locations	max. temperature rise measured,(K)	max. temperature rise limit, (K)
LINE L1	59,8	65
LINE L2	60,2	65
LINE L3	59,2	65
LOAD L1	58,7	65
LOAD L2	60,8	65
LOAD L3	59,7	65
Parts which need not be touched during normal operation: metallic	32,7	40
Parts which need not be touched during normal operation: non-metallic	29,5	50
Control circuit terminal A1	28,5	65
Control circuit terminal A2	27,6	65
Auxiliary circuit terminal 13	27,5	65
Auxiliary circuit terminal 14	28,3	65
supplementary information: None		

9.3.3.3.6a	**TABLE: Heating test, resistance method**					P
	Test voltage (V) ..... :		380			
	Ambient, t_1 (C) .....:		30			
	Ambient, t_2 (C) .....:		30			

Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class
Winding	326,4	394,5	54,1	110	B
supplementary information: None					

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9.3.3.3.6b	**TABLE: Heating test, resistance method**					P
	Test voltage (V) ..... :		380			
	Ambient, t_1 (C) ..... :		30			
	Ambient, t_2 (C) ..... :		30			
Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)	Max. dT (K)	Insulation class	
Winding	326,4	364,8	30,1	110	B	
supplementary information: None						

9.3.3.4	**TABLE: Dielectric Strength**(#01, CJX2-6311, Test sequence 1)	P
Test voltage applied between:	Test potential applied (kV)	Breakdown / flashover (Yes/No)
Between all the terminals of the main circuit connected(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;	1,89	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	1,89	No
Between each control and auxiliary circuit no normally connected to the main circuit and : —the main circuit, —the other circuits, —the exposed conductive parts, —the enclosure or mounting plate, Which, wherever appropriate, may be connected together;	1,89	No
supplementary information: None		

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	TABLE: Electrical Data (in normal conditions)					N/A
fuse #	I rated (A)	U (V)	P (W)	I (mA)	I fuse (mA)	condition/status
supplementary information:						

	TABLE: Power Input Deviation				N/A
Input deviation of/at:	P rated (W)	P measured (W)	dP	Required dP	Remark
supplementary information:					

	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:			

	TABLE: Impact Resistance		N/A
Impacts per surface	Surface tested	Impact energy (Nm)	Comments
supplementary information:			

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8.1.4,8.1.7	**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)
Between phases	8000	690	8	17,60	10	17,60
Between circuit conductors at different voltages	8000	690	8	24,20	10	>24,20
Between live and exposed conductive parts	-	-	-	-	-	-
supplementary information: None						

	TABLE: Distance Through Insulation Measurements				N/A
Distance through insulation di at/of:	U r.m.s. (V)	Test voltage (V)	Required di (mm)	di (mm)	
supplementary information:					

	TABLE: Ball Pressure Test of Thermoplastics		N/A
Allowed impression diameter (mm) ..... :			
Part	Test temperature (C)	Impression diameter (mm)	
supplementary information:			

8.1.8	**TABLE: Threaded Part Torque Test**		P
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Applied torque (Nm)
M8	Φ7,84	II	3,5
supplementary information: None			

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	TABLE: Over-voltage and Under-voltage Test				N/A
Test	Operating condition	Rated voltage (V)	Test voltage (V)	Temperature (^{o}C)	Comments
supplementary information:					

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	TABLE: Critical components information				N/A
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)]
supplementary information:					
[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

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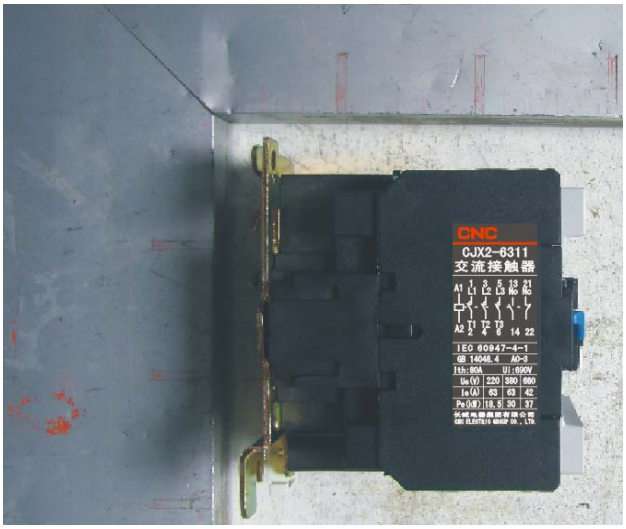
Photographs



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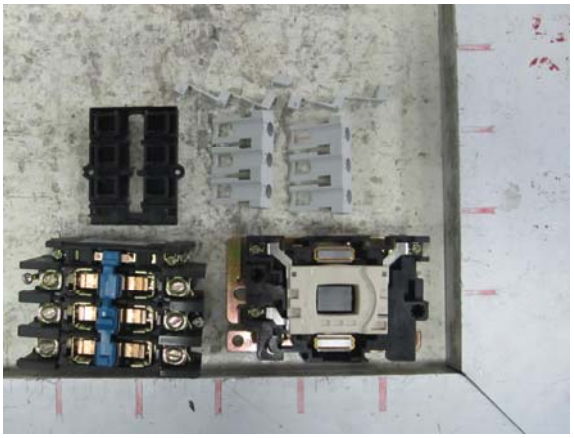

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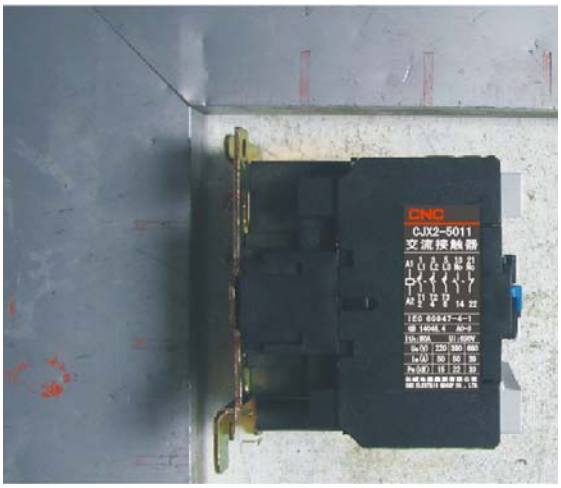

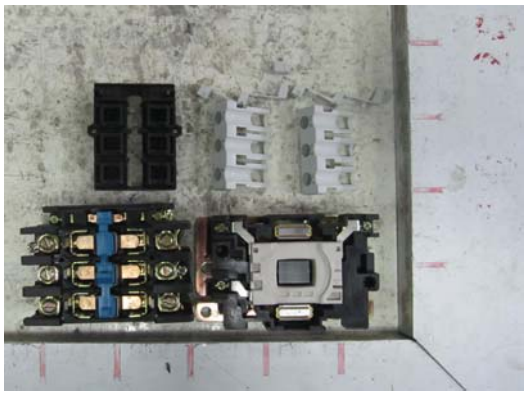

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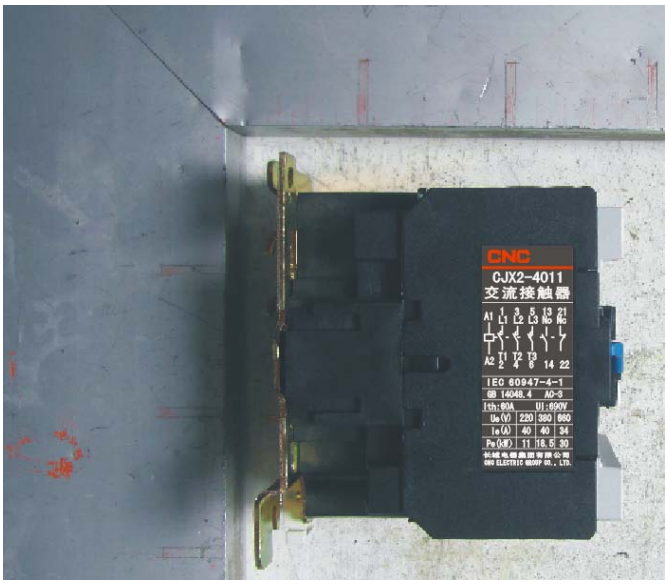

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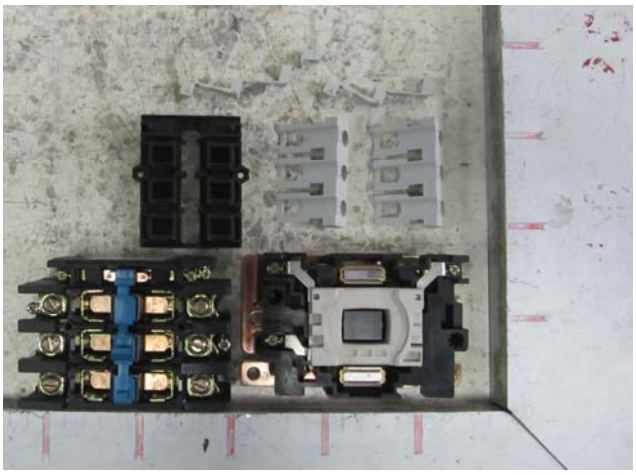

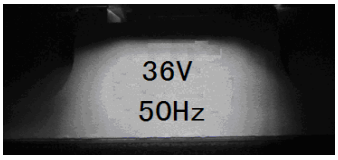

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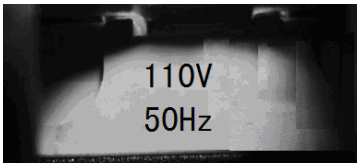

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Clause	Requirement + Test	Result - Remark	Verdict

Attachment 1

Annex F	**Requirements for auxiliary contact linked with power contact (mirror contact)**		
F.4	Product information		
	Clause 6 applies with the following addition.	Compliance	P
	Mirror contacts shall be clearly identified:	Compliance	P
	-on the contactor itself, or	-	N/A
	-in the manufacturer documentation, or	Compliance	P
	-both.	-	N/A
	Where a symbol is used to identify a mirror contact, it shall be as shown in Figure F.1		P
F.6	Constructional and performance requirements		
	Clause 8 applies with the following addition.	Compliance	P
	When any of the main contacts is closed,no mirror contact shall be closed.	Compliance	P
F.7.1	General		
	Clause 9 applies with the following addition.	Compliance	P
	Tests according to both F.7.2 and F.7.3 shall be carried out.	Compliance	P
	(sample No. #30~#32,CJX2-6311)		
F.7.2	Tests on products in a new condition		P
	For each mirror contact, the test shall be carried out on *m* products, where *m* is the number of main contacts	m:3	
	A new product is used for testing each mirror contact with each of the main contacts.	Compliance	
	Test procedure:		
	a) To simulate the occurrence of welding on one main pole, one main contact shall be maintained in the closed position, e.g. by welding or gluing each point of contact. The thickness of welding or gluing shall be such that the distance between contacts is not modified significantly and the method used shall be described in the test report.	Method: welding	P
	☒ b1) With the operating coil de-energized, an impulse test voltage of 2,5kV at sea level shall be applied across the mirror contact. There shall be no disruptive discharge.	Compliance	P
	Altitude of test laboratory [m]:	88,4	
	Test voltage [kV]:	2,5	

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Clause	Requirement + Test	Result - Remark	Verdict
	□b2) With the operating coil de-energized, the gap of the contact shall be measured with direct means; it shall be more than 0,5 mm. In case of two or more contact gaps in series, the sum of contact gaps shall be more than 0,5mm.	-	N/A
	The sequences a) and b) (b1) or b2)) are repeated on new samples for each main contact welded successively.	Compliance	P
	(sample No. #08~#09,CJX2-4011;#10~#11,CJX2-5011;#12~#13,CJX2-6311)		
F.7.3	Test after conventional operational performance		P
	At the end of the conventional operational performance tests according to 9.3.3.6, it shall be verified that, when the coil is energized, the mirror contact shall withstand its rated insulation voltage Ui.	U_{test}:0,69kV	P

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Clause	Requirement + Test	Result - Remark	Verdict

Attachment 2

8.3.1	**TEST SEQUENCE II (sample No. #25,CJX2-6311,AC-15,380V/0,95A)**		
Test No. 1	**- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.2)**		**P**
Test No. 2	**- Dielectric verification (8.3.3.5.5b))**		**P**

8.3.3.5	**TEST SEQUENCE II**		
8.3.3.5.2	**Making and breaking capacities of switching elements under normal conditions**		
	contact element (figure / form)	X,Y	
	contact polarity	Opposite polarity	
	utilization category .....:	AC-15	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	0,95 A	
Test No.1	- test voltage U/Ue = 1,1 (V) .....:	L1: 420 L2: - L3: -	P
	- power factor/time constant .....:	L1: 0,32/0,27 L2: - L3: -	P
	- make operations: test current I/Ie (A) .....:	L1: 10,6 L2: - L3: -	P
	- break operations: test current I/Ie (A) .....:	L1: 1,06 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	Compliance	P
	- on-time (ms) .....:	215~218	P
	- operating cycles per minute .....:	6	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of operating cycles .....:	50	P
	- test voltage U/Ue = 1,0 (V) .....:	L1: 382 L2: - L3: -	P
	- power factor/time constant .....:	L1: 0,32/0,27 L2: - L3: -	P
	- make operations: test current I/Ie (A) .....:	L1: 9,60 L2: - L3: -	P
	- break operations: test current I/Ie (A) .....:	L1: 0,96 L2: - L3: -	P
Test No. 2	- on-time (ms) .....:	217~226	P
	- operating cycles per minute .....:	60	P
	- number of operating cycles .....:	10	P
Test No. 3	- on-time (ms) .....:	225~228	P
	- operating cycles per minute .....:	60	P
	- number of operating cycles .....:	990	P
Test No. 4	- on-time (ms) .....:	205~212	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	Compliance	P
	- no contact welding or prolonged arcing	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V.....:	1000V	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	**TEST SEQUENCE II (sample No. #26,CJX2-6311,DC-13,220V/0,15A)**	
Test No. 1	**- Making and breaking capacities of switching elements under normal conditions (8.3.3.5.2)**	**P**
Test No. 2	**- Dielectric verification (8.3.3.5.5b))**	**P**

8.3.3.5	**TEST SEQUENCE II**		
8.3.3.5.2	**Making and breaking capacities of switching elements under normal conditions**		
	contact element (figure / form)	X,Y	
	contact polarity	Opposite polarity	
	utilization category .....:	DC-13	
	rated operational voltage Ue (V) .....:	220	
	rated operational current Ie (A) or power (kW) ....:	0,15 A	
Test No.1	- test voltage U/Ue = 1,1 (V) .....:	L1: 246 L2: - L3: -	P
	- power factor/time constant .....:	L1: 205ms L2: - L3: -	P
	- make operations: test current I/Ie (A) .....:	L1: 0,165 L2: - L3: -	P
	- break operations: test current I/Ie (A) .....:	L1: 0,165 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	Compliance	P
	- on-time (ms) .....:	517~533	P
	- operating cycles per minute .....:	6	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of operating cycles .....:	50	P
	- test voltage U/Ue = 1,0 (V) .....:	L1: 224 L2: - L3: -	P
	- power factor/time constant .....:	L1: 205ms L2: - L3: -	P
	- make operations: test current I/Ie (A) .....:	L1: 0,150 L2: - L3: -	P
	- break operations: test current I/Ie (A) .....:	L1: 0,150 L2: - L3: -	P
Test No. 2	- on-time (ms) .....:	502~534	P
	- operating cycles per minute .....:	60	P
	- number of operating cycles .....:	10	P
Test No. 3	- on-time (ms) .....:	521~527	P
	- operating cycles per minute .....:	60	P
	- number of operating cycles .....:	990	P
Test No. 4	- on-time (ms) .....:	511~532	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	Compliance	P
	- no contact welding or prolonged arcing	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with a min.of 1000V.....:	1000V	**P**

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	**TEST SEQUENCE III (sample No. #27,CJX2-6311,AC-15,380V/0,95A)**	
Test No. 1	**- Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.3)**	**P**
Test No. 2	**- Dielectric verification (8.3.3.5.5b))**	**P**

8.3.3.5	**TEST SEQUENCE III**		
8.3.3.5.3	**Making and breaking capacities of switching elements under abnormal conditions:**		
	contact element (figure / form)	X,Y	
	contact polarity	Opposite polarity	
	utilization category .....:	AC-15	
	rated operational voltage Ue (V) .....:	380	
	rated operational current Ie (A) or power (kW) ....:	0,95A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) .....:	L1: 420 L2: - L3: -	P
	- power factor/time constant .....:	L1: 0,30 L2: - L3: -	P
	- make operations: test current I/Ie (A) .....:	L1: 9,60 L2: - L3: -	P
	- break operations: test current I/Ie (A) .....:	L1: 9,60 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	Compliance	P
	- on-time (ms) .....:	128~137	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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	Compliance	P
	- no contact welding or prolonged arcing	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.....:	1000 V	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	**TEST SEQUENCE III (sample No. #28,CJX2-6311,DC-13,220V/0,15A)**	
Test No. 1	**- Making and breaking capacities of switching elements under abnormal conditions (8.3.3.5.3)**	**P**
Test No. 2	**- Dielectric verification (8.3.3.5.5b))**	**P**

8.3.3.5	**TEST SEQUENCE III**		
8.3.3.5.3	**Making and breaking capacities of switching elements under abnormal conditions:**		
	contact element (figure / form)	X,Y	
	contact polarity	Opposite polarity	
	utilization category .....:	DC-13	
	rated operational voltage Ue (V) .....:	220	
	rated operational current Ie (A) or power (kW) ....:	0,15A	
	Conditions, make/break operations:		
	- test voltage U/Ue = 1,1 (V) .....:	L1: 244 L2: - L3: -	P
	- power factor/time constant .....:	L1: 206ms L2: - L3: -	P
	- make operations: test current I/Ie (A) .....:	L1: 0,170 L2: - L3: -	P
	- break operations: test current I/Ie (A) .....:	L1: 0,170 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	Compliance	P
	- on-time (ms) .....:	509~533	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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	Compliance	P
	- no contact welding or prolonged arcing	Compliance	P
	- no blowing of the fusible element in the earth circuit	Compliance	P
	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.....:	1000 V	P

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.1.	**TEST SEQUENCE IV (sample No. #29,CJX2-6311)**	
Test No. 1	**- Performance under conditional short-circuit current (8.3.4)**	**P**
Test No. 2	**- Dielectric verification (8.3.3.5.5.b)**	**P**

	TEST SEQUENCE IV		
8.3.4	**Performance under conditional short-circuit current**		
	contact element (figure / form)	X,Y	
	contact polarity	Opposite polarity	
	type of SCPD .....:	Fuse RT14-10	
	ratings of SCPD .....:	380V/10A	
	prospective current .....:	1 kA	P
	test voltage (V) U/Ue = 1,1 (V) .....:	L1: 420	P
	r.m.s. test current obtained (kA) .....:	L1: 1,01	P
	power factor (max. 0,7)	0,69	P
	first CO operation by closing the separate making switch: test (Ip / I²dt (kA / kA²s) .....:	L1: 0,78 / 0,603	P
	time interval between test (min. 3 min) .....:	3min	P
	second CO operation by closing the separate making switch: test (Ip / I²dt (kA / kA²s) .....:	L1: 0,76 / 0,552	P
	time interval between test (min. 3 min) .....:	3min	P
	third CO operation by closing the separate making switch: test (Ip / I²dt (kA / kA²s) .....:	L1: 0,69 / 0,576	P
	Behaviour of the equipment during the test:		
	switching elements open by the normal actuating system	Compliance	P
	Dielectric verification:		
	dielectric test voltage (V) 2 xUe with min.of 1000V.....:	1000 V	P