

A large industrial facility, possibly a refinery or chemical plant, is shown at night. The scene is filled with tall distillation columns, complex piping, and numerous bright lights that illuminate the structures against a dark, purple-tinged sky. The overall atmosphere is one of intense industrial activity.

Environmental conditions

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Environmental conditions

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Mechanical device	Electro-mechanical device	Electronic device	Product function	Range of product	High altitude derating	Humidity
						IEC 60068-2-78, IEC 60068-2-30
	■		MCB	iC40	Page 10	Page 15
	■		MCB	iC60	Page 10	
	■		MCB	iK60, iK60N	-	
	■		MCB	C120	Page 10	
	■		MCB	NG125	Page 11	
	■		MCB DC	C60H-DC	Page 10	
	■		MCB DC	C60PV-DC	Page 10	
	■		MCB DC	C60NA-DC	Page 10	
	■		MCB DC	SW60-DC	-	
	■		MCB DC	C120NA-DC	-	
	■		MCB Motor	iC60LMA	Page 10	
	■		MCB Motor	NG125LMA	Page 11	
	■		Fuse	STI	Page 10	
	■		Fuse	SBI	Page 10	
	■		Fuse	D01	-	
	■		Fuse	D02	-	
		■	RCCB	iID	Page 10	
		■	RCCB	iID K	-	
		■	RCCB	iID40	Page 10	
		■	RCCB	RCCB-ID 125A	-	
		■	RCCB	REDs	-	
		■	RCCB	REDtest	-	
		■	RCD Add	Vigi C40, Vigi iC40, Vigi iCG40	Page 10	Page 15
		■	RCD Add	Vigi TG40, Vigi TG60	Page 10	
		■	RCD Add	Vigi iC60	Page 10	
		■	RCD Add	Vigi C120	Page 10	
		■	RCD Add	Vigi NG125	Page 11	
		■	RCBO	iC60 RCBO	Page 10	
	■		SPD	PRD1 25r	-	
	■		SPD	PRD1 35r	-	
	■		SPD	PRD1 Master	-	
	■		SPD	iPRF1	-	
	■		SPD	iPRD	-	
	■		SPD	iPF	-	
	■		SPD	iPF K	-	
	■		SPD	iQuick PRD	-	
	■		SPD	iQuick PF	-	
	■		SPD	iPRD-DC	-	
	■		SPD	iPRD PV-DC	-	
	■		Switch	iSW	Page 11	
	■		Switch	SW bico	-	
	■		Switch	iSW-NA	Page 11	
	■		Switch	NG125NA	-	
	■		Auxiliary	Aux 9 mm	-	
	■		Auxiliary	Aux 18 mm	-	
■			Connection	Comb busbar 9 mm	-	
■			Connection	Comb busbar 18 mm	-	
■			Connection	Comb busbar 27 mm	-	
■			Connection	Vertical comb busbar	-	
	■		M & C	iCT	Page 11	
	■		M & C	iTL16 A	Page 11	
	■		M & C	iTL32	Page 11	

Salt mist	Vibrations	Shock	Bump	IK impact	Vertical free fall
IEC 60068-2-52 Page 18	IEC 60068-2-6 Page 22	IEC 60068-2-27 Page 24	IEC 60068-2-27 Page 26	IEC 62262, IEC 60068-2-75 Page 28	ISO 2248 Page 31
-	-	-	-	-	-
Page 18	Page 22	Page 24	Page 26	Page 28	Page 31

Mechanical device	Electro-mechanical device	Electronic device	Product function	Range of product	High altitude derating	Humidity
	■		MCB	C60, C60 UL	Page 12	IEC 60068-2-78, IEC 60068-2-30 Page 16
		■	RCD Add	Vigi C60	Page 12	
		■	RCCB	ID-GFP	Page 12	
	■		Auxiliary	Aux 9 mm	-	
	■		Auxiliary	Aux 18 mm	-	
	■		M and C	TL	-	
	■		M and C	CT	-	

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Salt mist	Vibrations	Shock	Bump	IK impact	Vertical free fall
IEC 60068-2-52 Page 19	IEC 60068-2-6 Page 23	IEC 60068-2-27 Page 25	IEC 60068-2-27 Page 27	IEC 62262, IEC 60068-2-75 Page 29	ISO 2248 Page 32

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Enclosures, plugs and sockets

Mechanical device	Electro-mechanical device	Electronic device	Product function	Range of product	High altitude derating	Humidity
■			Enclosure	Kaedra	Page 13	IEC 60068-2-78, IEC 60068-2-30
■			Enclosure	Pragma		Page 17
■			Socket	PratiKa		

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Enclosures, plugs and sockets

	Salt mist	Vibrations	Shock	Bump	IK impact	Vertical free fall
	IEC 60068-2-52	IEC 60068-2-6	IEC 60068-2-27	IEC 60068-2-27	IEC 62262, IEC 60068-2-75	ISO 2248
	Page 20	No vibration conditions for enclosures, plugs and sockets	No shock conditions for enclosures, plugs and sockets	No bump conditions for enclosures, plugs and sockets	Page 30	Page 33



The equipment standards specify that the altitude of the place in which the products are to be installed should not exceed 2000 m.

The altitude does not affect the products' characteristics up to 2000 m.

Above that, it is necessary to allow for the reduction in dielectric strength and the cooling power of the air.

The table below shows the corrections to be made depending on the altitude.

Type		Altitude (m)			
Acti9 main products		≤ 2000	3000	4000	5000
Phase and Neutral circuit breakers: iC40					
Dielectric voltage withstand (V AC)		2500	2200	2000	-
Impulse withstand voltage U _{imp} (kV)		4	3	3	-
Rated insulation voltage U _i (V AC)	1P+N	400	320	320	-
	3P, 3P+N	440	400	320	-
Maximum rated operational voltage U _e (V AC)	1P+N	230	220	200	-
	3P, 3P+N	400	380	300	-
Rated current at reference ambient temperature		I _n	0.96 x I _n	0.93 x I _n	-
Breaking capacity (kA)		No change			
Add-on residual current devices for Phase and Neutral circuit breakers: Vigi iC40					
Maximum rated operational voltage	2P	230	220	200	-
U _e L/L (V AC)	3P, 4P	400	380	380	-
Sensibility IΔ _n (mA)		No change			
Circuit breakers up to 63 A: iC60					
Dielectric voltage withstand (V AC)		2500	2200	2000	1800
Impulse withstand voltage U _{imp} (kV)		6	5	5	4
Rated insulation voltage U _i L/L (V AC)		500	400	400	320
Maximum rated operational voltage U _e L/L (V AC)		440	400	400	300
Rated current at reference ambient temperature		I _n	0.96 x I _n	0.93 x I _n	0.9 x I _n
Breaking capacity (kA)		No change			
Add-on residual current devices for circuit breakers up to 63 A: Vigi iC60					
Maximum rated operational voltage	2P	240	220	220	-
U _e L/L (V AC)	3P, 4P	415	380	380	-
Sensibility IΔ _n (mA)		No change			
Direct current circuit breakers up to 63 A: C60H-DC, C60PV-DC, C60NA-DC					
Dielectric voltage withstand (V DC)		2500	2200	2000	1800
Impulse withstand voltage U _{imp} (kV)		6	5	5	4
Rated insulation voltage U _i (V DC)		500	400	400	320
Maximum rated operational voltage U _e (V DC)	1P	250	220	220	200
	2P	500	400	400	300
Rated current at reference ambient temperature		I _n	0.96 x I _n	0.93 x I _n	0.9 x I _n
Breaking capacity (kA)		No change			
Residual current circuit breakers: iID, iID40					
Dielectric voltage withstand (V AC)		2500	2200	2000	-
Impulse withstand voltage U _{imp} (kV)		6	5	5	-
Rated insulation voltage U _i (V AC)		500	400	400	-
Maximum rated operational voltage U _e (V AC)	2P	240	220	220	-
	4P	415	400	400	-
Rated current at reference ambient temperature		I _n	0.96 x I _n	0.93 x I _n	-
Breaking capacity (kA)		No change			
Residual current operated circuit-breakers: iC60 RCBO					
Dielectric voltage withstand (V AC)		2500	2200	2000	-
Impulse withstand voltage U _{imp} (kV)		6	5	5	-
Rated insulation voltage U _i L/L (V AC)		500	400	400	-
Maximum rated operational voltage U _e L/L (V AC)		415	380	380	-
Rated current at reference ambient temperature		I _n	0.96 x I _n	0.93 x I _n	-
Breaking capacity (kA)		No change			
Circuit breakers up to 125 A: C120					
Dielectric voltage withstand (V AC)		2500	2200	2000	1800
Impulse withstand voltage U _{imp} (kV)		6	5	5	4
Rated insulation voltage U _i L/L (V AC)		500	400	400	320
Maximum rated operational voltage U _e L/L (V AC)		415	380	380	300
Rated current at reference ambient temperature		I _n	0.96 x I _n	0.93 x I _n	0.9 x I _n
Breaking capacity (kA)		No change			
Add-on residual current devices for circuit breakers up to 125 A: Vigi C120					
Maximum rated operational voltage	2P	240	220	220	-
U _e L/L (V AC)	3P, 4P	415	380	380	-
Sensibility IΔ _n (mA)		No change			

Type	Altitude (m)			
Acti9 main products	≤ 2000	3000	4000	5000
High performance circuit breakers: NG125				
Dielectric voltage withstand (V AC)	2500	2200	2000	1800
Impulse withstand voltage U _{imp} (kV)	8	6	6	4
Rated insulation voltage U _i L/L (V AC)	690	500	500	400
Maximum rated operational voltage U _e L/L (V AC)	500	440	415	380
Rated current at reference ambient temperature	I _n	0.96 x I _n	0.93 x I _n	0.9 x I _n
Breaking capacity (kA)	No change			
Add-on residual current devices for high performances circuit breakers: Vigi NG125				
Maximum rated operational voltage U _e L/L (V AC)	2P	240	220	-
	3P, 4P	415	380	-
Sensibility I _{Δn} (mA)	No change			
Fuses: STI				
Rated insulation voltage U _i L/L (V AC)		500	400	-
Maximum rated operational voltage U _e (V AC)	8.5 x 31,5 mm	400	380	-
	10.3 x 38 mm	500	400	-
High voltage fuses: SBI				
Rated insulation voltage U _i L/L (V AC)		690	500	-
Maximum rated operational voltage U _e (V AC)	14 x 51 (≤ 25 A), 22 x 58 (≤ 80 A)	690	500	-
	14 x 51 (32-40 A)	500	400	-
	14 x 51 (50 A), 22 x 58 (100-125 A)	400	380	-
Switch-disconnectors: iSW				
Dielectric voltage withstand (V AC)		2500	2200	-
Impulse withstand voltage U _{imp} (kV)		6	5	-
Rated insulation voltage U _i (V AC)		500	400	-
Maximum rated operational voltage U _e (V AC)	1P	240	220	-
	2P, 3P, 4P	415	400	-
Rated current at reference ambient temperature		I _n	0.96 x I _n	-
Conditional rated short-circuit current (I _{nc} - kA)	No change			
Switch-disconnectors: iSW-NA				
Dielectric voltage withstand (V AC)		2500	2200	-
Impulse withstand voltage U _{imp} (kV)		6	5	-
Rated insulation voltage U _i (V AC)		500	400	-
Maximum rated operational voltage U _e (V AC)	1P+N	240	220	-
	3P+N	415	400	-
Rated current at reference ambient temperature		I _n	0.96 x I _n	-
Conditional rated short-circuit current (I _{nc} - kA)	No change			
Impulse Relay: iTL 16 A				
Rated current (A)	16	14.4	13.6	12
Electrical Endurance (AC22 - cycles)	40,000	36,000	34,000	30,000
Impulse withstand voltage U _{imp} (kV)	No change			
Rated insulation voltage U _i L/L (V AC)	No change			
Maximum rated operational voltage U _e L/L (V AC)	No change			
Impulse Relay: iTL 32 A				
Rated current (A)	32	28.8	27.2	24
Electrical Endurance (AC22 - cycles)	20,000	18,000	17,000	15,000
Impulse withstand voltage U _{imp} (kV)	No change			
Rated insulation voltage U _i L/L (V AC)	No change			
Maximum rated operational voltage U _e L/L (V AC)	No change			
Contactors: iCT				
Rated current (A)	16	14.4	13.6	12
	25	22.5	21.2	18.7
	40	36	34	30
	63	56.7	53.5	47.2
	100	90	85	75
Electrical endurance (cycles)	30,000	27,000	25,500	22,500
Impulse withstand voltage U _{imp} (kV)	No change			
Rated insulation voltage U _i L/L (V AC)	No change			
Maximum rated operational voltage U _e L/L (V AC)	No change			

Type	Altitude (m)			
Multi9 main products	≤ 2000	3000	4000	5000
Circuit breakers up to 63 A: C60				
Dielectric voltage withstand (V AC)	2500	2200	2000	1800
Impulse withstand voltage U _{imp} (kV)	6	5	5	4
Rated insulation voltage U _i L/L (V AC)	500	400	400	320
Maximum rated operational voltage U _e L/L (V AC)	440	400	400	300
Rated current at reference ambient temperature	I _n	0.96 x I _n	0.93 x I _n	0.9 x I _n
Breaking capacity (kA)	No change			
Circuit breakers up to 63 A: C60 UL				
Dielectric voltage withstand (V AC)	2500	2200	2000	1800
Impulse withstand voltage U _{imp} (kV)	6	5	5	4
Rated insulation voltage U _i L/L (V AC)	500	400	400	320
Maximum rated operational voltage U _e L/L (V AC)	480	400	400	300
Rated current at reference ambient temperature	I _n	0.96 x I _n	0.93 x I _n	0.9 x I _n
Breaking capacity (kA)	No change			
Add-on residual current devices for circuit breakers up to 63 A: Vigi C60				
Maximum rated operational voltage	2P	240	220	-
U _e L/L (V AC)	3P, 4P	415	380	-
Sensitivity I _{Δn} (mA)	No change			
Residual current circuit breakers: ID-GFP				
Dielectric voltage withstand (V AC)	2500	2200	2000	-
Impulse withstand voltage U _{imp} (kV)	6	5	5	-
Rated insulation voltage U _i (V AC)	500	400	400	-
Maximum rated operational voltage	2P	240	220	-
U _e (V AC)	4P	415	400	-
Rated current at reference ambient temperature	I _n	0.96 x I _n	0.93 x I _n	-
Breaking capacity (kA)	No change			

High altitude derating

Enclosures, plugs and sockets

Type	Altitude (m)			
Enclosures, plugs and sockets	≤ 2000	3000	4000	5000
Plastic enclosures: Kaedra, Pragma				
Rated current at reference ambient temperature	I_n	$0.96 \times I_n$	$0.93 \times I_n$	$0.9 \times I_n$
Industrial plugs and sockets: PratiKa				
Rated current at reference ambient temperature	I_n	$0.96 \times I_n$	$0.93 \times I_n$	$0.9 \times I_n$

Note:

No derating for: auxiliaries and accessories (linked to main product), SPD (linked with rated voltage).

No voltage derating for enclosures, plugs and sockets.

IEC 60068-2-78, IEC 60068-2-30 standards

Acti9

IEC 60068-2-78

Description

Environmental testing.

Part 2-78:

Tests - Test Cab: damp heat, steady state.

Scope

This part of IEC 60068 establishes a test method for determining the ability of electrical products, components or equipment to withstand transportation, storage and use under conditions of high humidity. The object of this standard is to investigate the effect of high humidity at constant temperature without condensation on a specimen over a prescribed period.

Severity

The test severity is defined by a combination of the temperature, relative humidity and total duration of testing.

Unless otherwise specified in the particular specifications, the temperature and relative humidity severities can be chosen from the following values:

Sévérité	Temperature	Humidity
Severity 1 (S1)	30°C ± 2	85% ± 3 relative humidity
Severity 2 (S2)	30°C ± 2	93% ± 3 relative humidity
Severity 3 (S3)	40°C ± 2	85% ± 3 relative humidity
Severity 4 (S4)	40°C ± 2	93% ± 3 relative humidity

Test duration

4 days.

IEC 60068-2-30

Description

Environmental testing.

Part 2-30:

Db tests and guide: Cyclic damp heat test (12 h + 12 h cycle).

Scope

This part of IEC 60068 determines the suitability of components, equipment or other articles for use, transportation and storage under conditions of high humidity – combined with cyclic temperature changes and, in general, producing condensation on the surface of the specimen. If the test is being used to verify the performance of a specimen whilst it is being transported or stored in packaging then the packaging will normally be fitted when the test conditions are being applied.

Severity

The chosen test severity is: 55°C 2 cycles 95% relative humidity.

IEC 60068-2-78, IEC 60068-2-30 standards

Acti9 (continued)

Type	Humidity	
Products (main products)	IEC 60068-2-78	IEC 60068-2-30
	Operating conditions	Transport conditions
Acti9		
Circuit breakers		
iC60, iC40, C120, NG125, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA, NG125L MA	S4	■
iK60N, K60	S3	■
Fuses		
STI, SBI, DO	S4	■
Residual current circuit breakers		
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125 A, REDs, REDtest	S4	■
Add-on residual current devices for circuit breakers		
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	S4	■
Auxiliaries of monitoring and control of protections		
iMN, iMN [®] , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	S4	■
Surge arresters		
iPRF1 12.5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	S4	■
Switch		
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	S4	■
Contactor, impulse relay		
iCT, iTL	S1	■
Connection		
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	S4	■

IEC 60068-2-78, IEC 60068-2-30 standards

Multi9

Type	Humidity	
Products (main products)	IEC 60068-2-78	IEC 60068-2-30
	Operating conditions	Transport conditions
Multi9		
Circuit breakers		
C60, C60UL	S4	■
Residual current circuit breakers		
ID-GFP	S4	■
Add-on residual current devices for circuit breakers		
Vigi C60	S4	■
Auxiliaries of monitoring and control of protections		
MN, MN $\square$, MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	S4	■
Contactor, impulse relay		
CT, TL	S1	■

IEC 60068-2-78, IEC 60068-2-30 standards

Enclosures, plugs and sockets

Type	Humidity	
Products (main products)	IEC 60068-2-78	IEC 60068-2-30
	Operating conditions	Transport conditions
Enclosures, plugs and sockets		
Plastic enclosures		
Kaetra, Pragma	S4	■
Industrial plugs and sockets		
PratiKa	S4	■

IEC 60068-2-52 standard

Acti9

Description

Environmental testing.

Part 2:

Tests - Test Kb: Cyclic salt spray test (sodium chloride solution).

Severity

Severity 2 (S2): 3 x 2 h salt mist / 20-22 h humidity storage.

Type	Salt mist
Level of stress applied	Severity 2 (S2)
Additional verifications post-stress Without recovery (at the end of the test)	Conductivity, temperature-rise. Absence of corrosion.

Type	Salt mist
Products (main products)	IEC 60068-2-52 Operating conditions
Acti9	
Circuit breakers	
iC60, iK60N, iC40, C120, NG125, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA, NG125L MA	S2
Fuses	
STI, SBI, DO	S2
Residual current circuit breakers	
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125 A, REDs, REDtest	S2
Add-on residual current devices for circuit breakers	
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	S2
Auxiliaries of monitoring and control of protections	
iMN, iMN [®] , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	S2
Surge arresters	
iPRF1 12,5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	S2
Switch	
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	S2
Contactor, impulse relay	
iCT, iTL	S2
Connnection	
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	S2

IEC 60068-2-52 standard

Multi9

Type	Salt mist
Products (main products)	IEC 60068-2-52
	Operating conditions
Multi9	
Circuit breakers	
C60	S2
Residual current circuit breakers	
ID-GFP	S2
Add-on residual current devices for circuit breakers	
Vigi C60	S2
Auxiliaries of monitoring and control of protections	
MN, MNIS, MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	S2
Contactor, impulse relay	
CT, TL	S2

IEC 60068-2-52 standard

Enclosures, plugs and sockets

Type	Salt mist
Products (main products)	IEC 60068-2-52
	Operating conditions
Enclosures, plugs and sockets	
Plastic enclosures	
Kaetra, Pragma	S2
Industrial plugs and sockets	
PratiKa	S2

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IEC 60068-2-6 standard

Acti9

Transportation conditions:

No breakage or damage to the product post-test.

Conditions of use:

No tripping during testing and no damage to the product afterwards.

Description

Environmental testing.

Part 2-6:

Tests - Test Fc: (sinusoidal) vibrations.

Scope

This part of IEC 60068 gives a method of test which provides a standard procedure to determine the ability of components, equipment and other articles, hereinafter referred to as specimens, to withstand specified severities of sinusoidal vibration. If an item is to be tested in an unpackaged form, that is without its packaging, it is referred to as a test specimen. However, if the item is packaged then the item itself is referred to as a product and the item and its packaging together are referred to as a test specimen.

Classification

Category 7g, 5 to 150 Hz

- Amplitude: ± 0.7 mm
- Acceleration: 7g
- 10 frequency sweep cycles per axis
- 1 octave per min., on the 3 perpendicular axes.

Category 5g, 5 to 150 Hz

- Amplitude: ± 0.35 mm
- Acceleration: 5g
- 10 frequency sweep cycles per axis
- 1 octave per min., on the 3 perpendicular axes.

Category 2g, 5 to 150 Hz

- Amplitude: ± 7.5 mm
- Acceleration: 2g
- 10 frequency sweep cycles per axis
- 1 octave per min., on the 3 perpendicular axes.

Category 1g, 5 to 150 Hz

- Amplitude: ± 3.5 mm
- Acceleration: 1g
- 10 frequency sweep cycles per axis
- 1 octave per min., on the 3 perpendicular axes.

IEC 60068-2-6 standard

Acti9 (continued)

Type	Vibrations	
Products (main products)	IEC 60068-2-6	
	Operating conditions	Transport conditions
Acti9		
Circuit breakers		
iC60, iK60N, iC40, C120, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA	2g ± 7.5 mm	7g ± 0.7 mm
iK60N, K60	2g ± 7.5 mm	7g ± 0.7 mm
NG125, NG125L MA	2g ± 7.5 mm	5g ± 0.35 mm
Fuses		
STI, SBI, DO	2g ± 7.5 mm	7g ± 0.7 mm
Residual current circuit breakers		
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125A, REDs, REDtest	2g ± 7.5 mm	7g ± 0.7 mm
Add-on residual current devices for circuit breakers		
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	2g ± 7.5 mm	7g ± 0.7 mm
Auxiliaries of monitoring and control of protections		
iMN, iMN [®] , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	1g ± 3.5 mm	2g ± 7.5 mm
Surge arresters		
iPRF1 12,5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	1g ± 3.5 mm	2g ± 7.5 mm
Switch		
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	2g ± 7.5 mm	7g ± 0.7 mm
Contactors, impulse relay		
iCT, iTL	1g ± 3.5 mm	2g ± 7.5 mm
Connection		
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	2g ± 7.5 mm	5g ± 0.35 mm

IEC 60068-2-6 standard

Multi9

Type	Vibrations	
Products (main products)	IEC 60068-2-6	
	Operating conditions	Transport conditions
Multi9		
Circuit breakers		
C60, C60UL	2g ± 7.5 mm	7g ± 0.7 mm
Residual current circuit breakers		
ID-GFP	2g ± 7.5 mm	7g ± 0.7 mm
Add-on residual current devices for circuit breakers		
Vigi C60	2g ± 7.5 mm	7g ± 0.7 mm
Auxiliaries of monitoring and control of protections		
MN, MN [®] , MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	1g ± 3.5 mm	2g ± 7.5 mm
Contactors, impulse relay		
CT, TL	1g ± 3.5 mm	2g ± 7.5 mm

Note:

No vibration conditions for enclosures, plugs and sockets.

IEC 60068-2-27 standard

Acti9

Transportation conditions:

No breakage or damage to the product post-test.

Conditions of use:

No tripping during testing and no damage to the product afterwards.

Description

Basic Environmental Testing Procedures.

Part 2:

Tests - Test Ea and guide: shocks.

Scope

The purpose of this test is to reveal mechanical weakness and/or degradation in specified performances, or accumulated damage or degradation caused by shocks. In conjunction with the relevant specification, this may be used in some cases to determine the structural integrity of specimens or as a means of quality.

This test is primarily intended for unpackaged specimens and for items in their transport case when the latter may be considered to be part of the specimen. If an item is to be tested unpackaged, it is referred to as a test specimen. However, if the item is packaged, then the item itself is referred to as a product and the item and its packaging together are referred to as a test specimen.

Testing

Test Ea

■ Acceleration, severity:

□ 10g 16 ms

□ 15g 11 ms

□ 30g 6 ms

■ 3 separate successive shocks for each direction on the 3 perpendicular axes.

Type	Shock	
Products (main products)	IEC 60068-2-27	
	Operating conditions	Transport conditions
Acti9		
Circuit breakers		
iC60, iK60N, iC40, C120, NG125, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA, NG125L MA	15g 11 ms	30g 6 ms
iK60N, K60	15g 11 ms	30g 6 ms
Fuses		
STI, SBI, DO	15g 11 ms	30g 6 ms
Residual current circuit breakers		
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125 A, REDs, REDtest	15g 11 ms	30g 6 ms
Add-on residual current devices for circuit breakers		
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	15g 11 ms	30g 6 ms
Auxiliaries of monitoring and control of protections		
iMN, iMN ² , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	10g 16 ms	15g 11 ms
Surge arresters		
iPRF1 12,5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	10g 16 ms	15g 11 ms
Switch		
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	10g 16 ms	15g 11 ms
Contactor, impulse relay		
iCT, iTL	10g 16 ms	15g 11 ms
Connnection		
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	15g 11 ms	30g 6 ms

IEC 60068-2-27 standard

Multi9

Type	Shock	
Products (main products)	IEC 60068-2-27	
	Operating conditions	Transport conditions
Multi9		
Circuit breakers		
C60, C60UL	15g 11 ms	30g 6 ms
Residual current circuit breakers		
ID-GFP	15g 11 ms	30g 6 ms
Add-on residual current devices for circuit breakers		
Vigi C60	15g 11 ms	30g 6 ms
Auxiliaries of monitoring and control of protections		
MN, MN ² , MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	10g 16 ms	15g 11 ms
Contactors, impulse relay		
iCT, iTL	10g 16 ms	15g 11 ms

Note:

No shock conditions for enclosures, plugs and sockets.

Bump (successive shocks)

IEC 60068-2-27 standard

Acti9

Transportation conditions:

No breakage or damage to the product post-test.

Conditions of use:

No tripping during testing and no damage to the product afterwards.

Description

Basic Environmental Testing Procedures.

Part 2:

Tests - Test Ea and guide: bumps.

Testing

Test Ea

■ Acceleration, severity:

□ 5g 30 ms

□ 15g 6 ms

□ 25g 6 ms

■ 100 separate successive shocks for each direction on the 3 perpendicular axes.

Type	Bump (successive shocks)	
Products (main products)	IEC 60068-2-27	
	Operating conditions	Transport conditions
Acti9		
Circuit breakers		
iC60, iK60N, iC40, C120, NG125, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA, NG125L MA	15g 6 ms	25g 6 ms
iK60N, K60	15g 6 ms	25g 6 ms
Fuses		
STI, SBI, DO	15g 6 ms	25g 6 ms
Residual current circuit breakers		
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125 A, REDs, REDtest	15g 6 ms	25g 6 ms
Add-on residual current devices for circuit breakers		
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	15g 6 ms	25g 6 ms
Auxiliaries of monitoring and control of protections		
iMN, iMN [®] , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	5g 30 ms	15g 6 ms
Surge arresters		
iPRF1 12,5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	5g 30 ms	15g 6 ms
Switch		
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	5g 30 ms	15g 6 ms
Contactors, impulse relay		
iCT, iTL	5g 30 ms	15g 6 ms
Connection		
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	15g 6 ms	25g 6 ms

Bump (successive shocks)

IEC 60068-2-27 standard

Multi9

Type	Bump (chocs répétés)	
Products (main products)	IEC 60068-2-27	
	Operating conditions	Transport conditions
Multi9		
Circuit breakers		
C60, C60UL	15g 6 ms	25g 6 ms
Residual current circuit breakers		
ID-GFP	15g 6 ms	25g 6 ms
Add-on residual current devices for circuit breakers		
Vigi C60	15g 6 ms	25g 6 ms
Auxiliaries of monitoring and control of protections		
MN, MN ² , MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	5g 30 ms	15g 6 ms
Contactors, impulse relay		
iCT, iTL	5g 30 ms	15g 6 ms

Note:

No bump conditions for enclosures, plugs and sockets.

IEC 62262 and IEC 60068-2-75 standards

Acti9

Description

Degrees of protection provided by the enclosures of electrical equipment against external mechanical impacts (IK code).

Testing

Test Eha: pendulum hammer (as per IEC 60068-2-75)

- Protection against mechanical impacts is verified by applying blows to the enclosure to be tested.
- There should be five impacts on each exposed surface.
- In no case should more than three impacts be applied in the vicinity of a given point on the enclosure. No breakage or damage to the product post-test.

Correspondence between the IK code and the impact energy

	IK code									
	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Impact energy (J)	0.14	0.2	0.35	0.5	0.7	1	2	5	10	20

The test is performed on the total surface of the products. No transportation test, because the products are packed.

Type	IK impact
Products (main products)	IEC 62262 and IEC 60068-2-75
	Operating conditions
Acti9	
Circuit breakers	
iC60, iK60N, iC40, C120, NG125, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA, NG125L MA	IK05
iK60N, K60	IK05
Fuses	
STI, SBI, DO	IK05
Residual current circuit breakers	
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125 A, REDs, REDtest	IK05
Add-on residual current devices for circuit breakers	
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	IK05
Auxiliaries of monitoring and control of protections	
iMN, iMN ² , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	IK03
Surge arresters	
iPRF1 12,5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	IK03
Switch	
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	IK05
Contactors, impulse relay	
iCT, iTL	IK01
Connnection	
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	IK05

IEC 62262 and IEC 60068-2-75 standards

Multi9

Type	IK impact
Products (main products)	IEC 62262 and IEC 60068-2-75
	Operating conditions
Multi9	
Circuit breakers	
C60, C60UL	IK05
Residual current circuit breakers	
ID-GFP	IK05
Add-on residual current devices for circuit breakers	
Vigi C60	IK05
Auxiliaries of monitoring and control of protections	
MN, MN $\bar{S}$, MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	IK03
Contactors, impulse relay	
CT, TL	IK01

IEC 62262 and IEC 60068-2-75 standards

Enclosures, plugs and sockets

Type	IK impact
Products (main products)	IEC 62262 and IEC 60068-2-75
	Operating conditions
Enclosures, plugs and sockets	
Plastic enclosures	
Kaedra	IK09
Pragma	IK08
Industrial plugs and sockets	
PratiKa	IK08

Vertical free fall

ISO 2248 standard

Acti9

Description

Environmental testing.

Vertical impact test by free fall of complete filled packages.

Scope

This vertical impact test method by free fall of complete filled packages is designed to measure the strength of the packaging in a distribution system which involves a risk of vertical impact.

Testing

Test at 0.8 m or 1.2 m, one fall per surface, for the 6 surfaces on a concrete surface after storage in humidity 48 h at 30°C and 85% RH.

No breakage or damage to the product post-test.

Type	Vertical free fall
Products (main products)	ISO 2248
	Transport conditions
Acti9	
Circuit breakers	
iC60, iK60N, iC40, C120, NG125, C60H-DC, C60PV-DC, C60NA-DC, iC60L MA, NG125L MA	0.8 m
iK60N, K60	0.8 m
Fuses	
STI, SBI, DO	0.8 m
Residual current circuit breakers	
iID, iID K, ITG40, ID C40, iID40, RCCB-ID 125 A, REDs, REDtest	0.8 m
Add-on residual current devices for circuit breakers	
Vigi iC60, Vigi C120, Vigi NG125, Vigi TG40, Vigi TG60, Vigi C40, Vigi iC40, Vigi iCG40	0.8 m
Auxiliaries of monitoring and control of protections	
iMN, iMN [®] , iMNx, iMSU, iMX, iMX+OF, iOF, iSD, iOF/SD+OF, iOF+SD24	0.8 m
Surge arresters	
iPRF1 12,5, PRD1 35r, PRD1 25r, PRD1 Master, iPF, iPF K, iPRD, iQuick PRD, iQuick PF, iPRD-DC, iPRD PV-DC	0.8 m
Switch	
iSW, SW Biconnect, iSW-NA, NG125NA, SW60-DC, C120NA-DC	0.8 m
Contactors, impulse relay	
iCT, iTL	0.8 m
Connection	
Horizontal comb busbar 9, 18, 27 mm, vertical comb busbar	1.2 m

ISO 2248 standard

Multi9

Type	Vertical free fall
Products (main products)	ISO 2248
	Transport conditions
Multi9	
Circuit breakers	
C60, C60UL	0.8 m
Residual current circuit breakers	
ID-GFP	0.8 m
Add-on residual current devices for circuit breakers	
Vigi C60	0.8 m
Auxiliaries of monitoring and control of protections	
MN, MN [®] , MNx, MSU, MX, MX+OF, OF, SD, OF/SD+OF	0.8 m
Contactors, impulse relay	
CT, TL	0.8 m

ISO 2248 standard

Enclosures, plugs and sockets

Type	Vertical free fall
Products (main products)	ISO 2248
	Transport conditions
Enclosures, plugs and sockets	
Plastic enclosures	
Kaedra	1.2 m
Pragma	1.2 m
Industrial plugs and sockets	
PratiKa	1.2 m







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