




Prüfbericht-Nr.: <i>Test report no.:</i>	CN24ORYA 001	Auftrags-Nr.: <i>Order no.:</i>	326020165	Seite 1 von 28 Page 1 of 28	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2116531	Auftragsdatum: <i>Order date:</i>	2024-04-09		
Auftraggeber: <i>Client:</i>	Shanghai PYTES Energy Co., Ltd. No.3492 Jinqian Road, Fengxian District 201400 Shanghai P.R. China				
Prüfgegenstand: <i>Test item:</i>	Enclosure				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	R-BOX-NEMA3, V-BOX-NEMA3				
Auftrags-Inhalt: <i>Order content:</i>	Perform NEMA3 test				
Prüfgrundlage: <i>Test specification:</i>	Only test section 5 of ANSI/NEMA250				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-04-25				
Prüfmuster-Nr.: <i>Test sample no.:</i>	24SAS01P19D31-00495				
Prüfzeitraum: <i>Testing period:</i>	2024-05-08 - 2024-05-10				
Ort der Prüfung: <i>Place of testing:</i>	STIEE				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>reviewed by:</i>	 Signed by: Tonghui Wu		genehmigt von: <i>authorized by:</i>	 Signed by: Wencai Zhang	
Datum: <i>Date:</i>	2024-05-23		Ausstelldatum: <i>Issue date:</i>	2024-05-24	
Stellung / Position:	Project Engineer		Stellung / Position:	Authorizer	
Sonstiges / Other:	This report is created for commission test, R-BOX-NEMA3 and V-BOX-NEMA3 were tested under NEMA3, all test items passed.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/A = not applicable	5 = poor N/T = not tested
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>					

V05

Test item description

Trade Mark: N/A

Manufacturer: Shanghai PYTES Energy Co., Ltd.

Model and/or Type reference: R-BOX-NEMA3, V-BOX-NEMA3

Rating(s): R-BOX-NEMA3: 530*400,3*734,7mm, V-BOX-NEMA3:
521,5*403,9*647,4mm. NEMA3**Copy of marking plate**

N/A

Summary of testing:

**Enclosure R-BOX-NEMA3 and V-BOX-NEMA3 were selected samples to performer NEMA3 tests.
The results of tests were valid only for the coming samples.**

All tests were passed.

Testing Laboratory:Shanghai Testing & Inspection Institute for Electrical Equipment Co., LTD.(STIEE) /
NO.358, North Huancheng Road, Shanghai, P.R. CHINA

Test item particulars	:	
- Classification of installation and use	:	N/A
- Supply Connection	:	N/A
Possible test case verdicts:		
- test case does not apply to the test object.....	:	N/A
- test object does meet the requirement.....	:	P(Pass)
- test object does not meet the requirement.....	:	F(Fail)
Testing		
Date of receipt of test item	:	25.04.2024
Date(s) of performance of tests	:	08.05.2024 to 10.05.2024
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.		
General product information		
N/A		

Photo:







ANSI/NEMA 250					
Clause	Requirement – Test			Result	Verdict
Section 5	Design Tests				—
5.1	General				—
	Each enclosure type shall be evaluated to the specific design tests as outlined in Tables 5-1A to 5-1D and Section 5.1.5 to demonstrate conformance with this Standard. To assure realistic testing, the enclosure and its enclosed equipment shall be mounted as intended for use in service or in accordance with the manufacturer's instructions.				P
	The first and last columns of Tables 5-1A through 5-1D provide the NEMA Enclosure Types and the corresponding IP Ratings from ANSI/IEC 60529, Degrees of protection provided by enclosures (IP Code) (IEC 60529). Documented compliance with a NEMA Type enclosure rating may be considered as suitable compliance corresponding to specific attributes of IP ratings as shown in the rightmost columns of Tables 5-1A through 5-1D. IP ratings cannot be converted directly to NEMA enclosure Type ratings. Where the rightmost column of Tables 5-1A through 5-1D indicates "None," the evaluations of IEC 60529 are deemed to be inadequate to represent the corresponding NEMA 250 test indicated for that attribute and/or degree of performance.				P
5.1.1	Protection against Access to Hazardous Parts and against Solid Foreign Objects				—
	All enclosures provide protection of persons against access to hazardous parts by preventing or limiting the ingress of a part of the human body or an object held by a person. At the same time, the enclosure provides protection of equipment against the ingress of solid foreign objects.				P
5.1.2	Protection against Access to Hazardous Parts				P
	Table 5-1A gives brief descriptions and definitions for the degrees of protection against access to hazardous parts. Degrees of protection listed in this table shall be specified only by the type designation and not by reference to the brief description or definition.				P
	To comply with the conditions of the type designation, adequate clearance shall be kept between the access probe and hazardous parts.				P
	1, 2, 3R, 3RX	<i>Protected against access to hazardous parts with a finger or wire</i>	Non-vented: If live parts <102 mm, an access probe of 3.2 mm will not penetrate If live parts ≥ 102 mm, an access probe of 12.7 mm will not penetrate Vented: If live parts <102 mm, an access probe of 12.7 mm will not penetrate If live parts ≥ 102 mm, an access probe of 19 mm will not penetrate	Non-vented: IP3X Vented: IP2X	N/A
	3, 3X	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	P
	3S, 3SX	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A
	4	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A
	4X	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A

ANSI/NEMA 250							
Clause	Requirement – Test			Result	Verdict		
	5	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A		
	6	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A		
	6P	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A		
	12, 12K	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A		
	13	<i>Protected against access to hazardous parts with a wire</i>	An access probe of 1.0 mm shall not penetrate	IP6X	N/A		
5.1.3	Protection against Solid Foreign Objects					—	
	Table 5-1B gives brief descriptions and the definitions for the degrees of protection against the penetration of solid foreign objects, including dust. Degrees of protection listed in this table shall only be specified by the type designation and not by reference to the brief description or definition.					P	
	Dusttight enclosures do not allow any dust to penetrate.					P	
	Tab. 5-1B Degrees of Protection against Solid Foreign Objects					—	
	Enclosure Type	Test Conditions	Brief Description	Definition	Corresponding IP First Characteristic Numeral	P	
	1, 2, 3R, 3RX	<i>Non-vented 5.2.1</i>	<i>Protected against solid foreign objects (falling dirt) of 3.2 mm and greater</i>	<i>on-vented If live parts < 102 mm, an access probe of 3.2 mm will not penetrate</i>	3	N/A	
		<i>Vented 5.2.2</i>		<i>Non-vented If live parts ≥ 102 mm, an access probe of 12.7 mm will not penetrate Vented If live parts < 102 mm, an access probe of 12.7 mm will not penetrate If live parts ≥ 102 mm, an access probe of 19 mm will not penetrate</i>	2		
	3, 3X	<i>Non-vented 5.5.1 Either Method Vented 5.5.1 Dust Blast Method</i>	<i>Windblown dust protected</i>	<i>No ingress of dust</i>	6	P	
	3S, 3SX	<i>Non-vented 5.5.1 Either Method Vented 5.5.1 Dust Blast Method</i>	<i>Windblown dust protected</i>	<i>No ingress of dust</i>	6	N/A	
	4	<i>Non-vented 5.7 Vented 5.5.1 Dust Blast Method</i>	<i>Windblown dust protected</i>	<i>No ingress of dust</i>	6	N/A	

ANSI/NEMA 250						
Clause	Requirement – Test			Result		Verdict
	4X	Non-vented 5.7 Vented 5.5.1 Dust Blast Method	Windblown dust protected	No ingress of dust	6	N/A
	5	Non-vented 5.5.2.2 Either Method Vented 5.5.2.2 Setting Dust Method	Setting dust protected	No ingress of dust	6	N/A
	6	5.7 5.11	Protected against solid foreign objects	No ingress	6	N/A
	6P	5.7 5.11	Protected against solid foreign objects	No ingress	6	N/A
	12, 12K	Non-vented 5.5.2.1 Either Method Vented 5.5.2.1 Circulating Dust Method	Circulating dust protected	No ingress of dust	6	N/A
	13	Non-vented 5.13 Vented 5.5.2.1 Circulating Dust Method	Circulating dust protected	No ingress of dust	6	N/A

5.1.4	Degrees of Protection against Ingress of Water					—
	The enclosure type indicates the degree of protection provided by enclosures with respect to harmful effects on the equipment due to the ingress of water. The tests for the ingress of water are carried out with fresh water. The actual protection may not be satisfactory if cleaning operations with high pressure and/or solvents are used.					P
	Table 5-1C gives brief descriptions and definitions of the protection for the degrees represented by the type designation. Degrees of protection listed in this table shall be specified by the type designation and not by reference to the brief description or definition.					P
	Tab. 5-1C Degrees of Protection against Water					—
	Enclosure Type	Test Conditions	Brief Description	Definition	Corresponding IP second Characteristic Numeral	P
	1	-	Not protected against water ingress	-	0	N/A
	2	5.3 Method A	Protected against vertically falling water drops and light splashing of water	Vertically falling water drops and light splashing shall have no harmful effects	1	N/A

ANSI/NEMA 250						
Clause	Requirement – Test		Result		Verdict	
		5.3 <i>Method B</i>	<i>Protected against vertically falling water drop when enclosure tilted up to 15°</i>	<i>Vertical falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of vertical</i>	2	
	3, 3X	<i>Non-vented</i> 5.5.1 <i>Vented</i> 5.5.1 <i>Hose Method or 5.4</i>	<i>Protected against rain, sleet, and snow</i>	<i>Water sprayed at an angle up to 45° shall not enter</i>	5 No Ingress Allowed	P
	3R, 3RX	5.4	<i>Protected against rain, sleet, and snow</i>	<i>Water sprayed at an angle up to 45° shall not enter</i>	4	N/A
	3S, 3SX	<i>Non-vented</i> 5.5.1 <i>Vented</i> 5.5.1 <i>Hose Method or 5.4</i>	<i>Protected against rain, sleet, and snow</i>	<i>Water sprayed at an angle up to 45° shall not enter</i>	5 No Ingress Allowed	N/A
	4	5.7	<i>Protected against rain, sleet, and snow</i>	<i>Water projected against the enclosure in any direction shall not enter</i>	6 No Ingress Allowed	N/A
	4X	5.7	<i>Protected against rain, sleet, and snow</i>	<i>Water projected against the enclosure in any direction shall not enter</i>	6 No Ingress Allowed	N/A
	5	<i>Non-vented</i> 5.5.2.2 <i>Vented</i> 5.5.2.2 <i>Atomized Water</i> <i>Method B or 5.3 Method A</i>	<i>Protected against dripping and Light splashing of water</i>	<i>Vertically falling water drops and light plashing shall have no harmful effects</i>	3 No Ingress Allowed	N/A
	6	5.7 5.11	<i>Protected against hoses directed water and entry of water during temporary submersion at limited depths</i>	<i>Water will not enter when projected against the enclosure in any direction and during temporary submersion</i>	7 No Ingress Allowed	N/A
	6P	5.7 5.11	<i>Protected against hoses directed water and entry of water during temporary submersion at limited depths</i>	<i>Water will not enter when projected against the enclosure in any direction and during temporary submersion</i>	8 No Ingress Allowed	N/A

ANSI/NEMA 250						
Clause	Requirement – Test			Result	Verdict	
	12, 12K	<i>Non-vented</i> 5.5.2.1 <i>Vented</i> 5.5.2.1 <i>Atomized Water Method A or 5.3 Method A</i>	<i>Protected against dripping and light splashing of water</i>	<i>Vertically falling water drops and light splashing shall have no harmful effects</i>	4 No Ingress Allowed	N/A
	13	5.13	<i>Protected against dripping and light splashing of water</i>	<i>Vertically falling water drops and light splashing shall have no harmful effects</i>	None	N/A

5.1.5	Additional Protection Offered by Enclosure Types					—
	Table 5-1D gives descriptions and definitions for the additional protection provided by enclosures by types.					N/A
	Tab. 5-1D Additional Protection					—
	Enclosure Type	Test Conditions	Brief Description	Definition	Corresponding IP second Characteristic Numeral	N/A
	1	5.8	<i>Indoor corrosion protection</i>	<i>Enclosure provides limited corrosion protection for indoor use</i>	None	N/A
	2	5.8	<i>Indoor corrosion protection</i>	<i>Enclosure provides limited corrosion protection for indoor use</i>	None	N/A
	3	5.6 5.9	<i>Outdoor corrosion protection And undamaged by the external formation of ice</i>	<i>Enclosure can be used in outdoor environments and is not damaged by ice that forms on the outside</i>	None	N/A
	3X	5.6 5.9 5.10	<i>Outdoor corrosion protection And undamaged by the external formation of ice</i>	<i>Enclosure provides increased corrosion protection and is not damaged by ice that forms on the outside</i>	None	N/A

ANSI/NEMA 250						
Clause	Requirement – Test			Result		Verdict
	3R	5.6 5.9	<i>Outdoor corrosion protection And undamaged by the external formation of ice</i>	<i>Enclosure can be used in outdoor environments and is not damaged by ice that forms on the outside</i>	None	N/A
	3RX	5.6 5.9 5.10	<i>Outdoor corrosion protection And undamaged by the external formation of ice</i>	<i>Enclosure provides increased corrosion protection and is not damaged by ice that forms on the outside</i>	None	N/A
	3S	5.6 5.9	<i>Outdoor corrosion protection and external mechanism remain operable when iceladen</i>	<i>Enclosure can be used in outdoor environments, is not damaged by ice that forms on the outside, and the mechanism can be operated while ice-laden</i>	None	N/A
	3SX	5.6 5.9 5.10	<i>Special corrosion protection and external mechanism remain operable when ice-laden</i>	<i>Enclosure provides increased corrosion protection, is not damaged by ice that forms on the outside, and the mechanism can be operated while ice-laden</i>	None	N/A
	4	5.6 5.9	<i>Outdoor corrosion protection and undamaged by the external formation of ice</i>	<i>Enclosure can be used in outdoor environments and is not damaged by ice that forms on the outside</i>	None	N/A
	4X	5.6 5.9 5.10	<i>Outdoor corrosion protection and undamaged by the external formation of ice</i>	<i>Enclosure provides increased corrosion protection and is not damaged by ice that forms on the outside</i>	None	N/A
	5	5.8	<i>Indoor corrosion protection</i>	<i>Enclosure provides limited corrosion protection for indoor use</i>	None	N/A

ANSI/NEMA 250						
Clause	Requirement – Test			Result		Verdict
	6	5.6 5.9	<i>Outdoor corrosion protection and undamaged by the external formation of ice</i>	<i>Enclosure can be used in outdoor environments and is not damaged by ice that forms on the outside</i>	None	N/A
	6P	5.6 5.9 5.10	<i>Outdoor corrosion protection and undamaged by the external formation of ice</i>	<i>Enclosure provides increased corrosion protection and is not damaged by ice that forms on the outside</i>	None	N/A
	12, 12K	5.8	<i>Indoor corrosion protection</i>	<i>Enclosure provides limited corrosion protection for indoor use</i>	None	N/A
	13	5.8 5.13 5.14	<i>Indoor corrosion protection Protected against spraying, splashing, and seepage of oil and non-corrosive liquids</i>	<i>Enclosure provides limited corrosion protection for indoor use and prevents entry of oil</i>	None	N/A

5.2	Test for Protection against Access to Hazardous Parts		—
	This test is intended to evaluate the degree of protection of persons from access to hazard parts.		P
5.2.1	Nonventilated Enclosures Test Method		P
	For nonventilated enclosures with live parts located less than 102 mm (4 in.) from the opening, this test shall be made by attempting to insert a rod having a diameter of 3.2 mm ($\frac{1}{8}$ in.).		P
	For nonventilated enclosures with live parts located 102 mm (4 in.) or more from the opening, this test shall be made by attempting to insert a rod having a diameter of 12.7 mm ($\frac{1}{2}$ in.).		P
5.2.2	Ventilated Enclosures Test Method		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	For ventilated enclosures with live parts located less than 102 mm (4 in.) from the opening, this test shall be made by attempting to insert a rod having a diameter of 12.7 mm (½ in.). For ventilated enclosures with live parts located 102 mm (4 in.) or more from the opening, this test shall be made by attempting to insert a rod having a diameter of 19 mm (¾ in.).		N/A
5.2.3	Evaluation		P
	The enclosure shall be considered to be in compliance with the requirements if the rod cannot enter the enclosure.		P
5.3	Test for Protection against Ingress of Water (Dripping and Light Splashing)		—
	This test is intended to simulate the dripping and light splashing of liquids.		N/A
5.3.1	Method A		N/A
	The enclosure shall be mounted beneath a drip test apparatus that extends beyond all exposed sides of the enclosure. The drip test apparatus shall be equipped with uniformly distributed water drip sources. There shall be one drip source for every 129 cm ² (20 in. ²) of test surface area, and each drip source shall have a drip rate of at least 20 drops of water per minute. The enclosure shall be subjected to continuously dripping water for 30 minutes.		N/A
	The conduit shall be connected as intended.		N/A
5.3.2	Method B		N/A
	The enclosure with a conduit connected shall be mounted as intended and the top exposed to a water spray falling for one hour at the rate of 25 ±10 mm/h (1 ±¾ in./h) at any angle up to 15 degrees from the vertical.		N/A
5.3.3	Evaluation		N/A
	A Type 2 enclosure shall be considered to be in compliance with the requirements if at the conclusion of the test there is no significant accumulation of water within the enclosure and no water has entered the enclosure at a level higher than the lowest live part.		N/A
5.3.3.1	Evaluation Considering Live Parts		N/A

ANSI/NEMA 250																							
Clause	Requirement – Test	Result	Verdict																				
	Water shall be permitted to enter above live parts if the equipment is so constructed that no water is visible on the live parts, insulating material, or mechanism parts, and no water has entered any space within the enclosure in which wiring may be present under any proper installation conditions.		N/A																				
5.4	Test for Protection against Ingress of Water (Rain)		—																				
	This test is intended to simulate falling rain.		P																				
	An enclosure that complies with the requirements of this test may be considered to be in compliance with the requirements of 5.3.	R-BOX-NEMA3, V-BOX-NEMA3: NEMA3 (IPX5) No trace of hazard water.	P																				
5.4.1	Method		P																				
	A complete enclosure with a conduit connected shall be mounted as in actual service except that the conduit shall be connected without using a pipe thread sealing compound. Rigid conduit shall be threaded into the opening in the enclosure and tightened with the torque as specified in Table 5-2.		P																				
	<table border="1"> <thead> <tr> <th colspan="2">Torque</th> <th colspan="2">Conduit size</th> </tr> <tr> <th>Newton-Meters</th> <th>Pound-Inches</th> <th>Trade Size</th> <th>Metric Designator</th> </tr> </thead> <tbody> <tr> <td>90,4</td> <td>800</td> <td>¾ and smaller</td> <td>21 and smaller</td> </tr> <tr> <td>113</td> <td>1000</td> <td>1, 1¼, and 1½</td> <td>27, 35, and 41</td> </tr> <tr> <td>180,8</td> <td>1600</td> <td>2 and larger</td> <td>53 and larger</td> </tr> </tbody> </table>	Torque		Conduit size		Newton-Meters	Pound-Inches	Trade Size	Metric Designator	90,4	800	¾ and smaller	21 and smaller	113	1000	1, 1¼, and 1½	27, 35, and 41	180,8	1600	2 and larger	53 and larger		
Torque		Conduit size																					
Newton-Meters	Pound-Inches	Trade Size	Metric Designator																				
90,4	800	¾ and smaller	21 and smaller																				
113	1000	1, 1¼, and 1½	27, 35, and 41																				
180,8	1600	2 and larger	53 and larger																				
	The test apparatus shall consist of at least three spray heads mounted in a water supply pipe rack, as shown in Figure 5-1. Spray heads shall be constructed in accordance with the details shown in Figure 5-2.		P																				
	The enclosure shall be positioned in the focal area of the spray heads so that the greatest quantity of water is likely to enter the enclosure. The water pressure is to be maintained at 34.5 kPa (5 psi) at each spray head, and a continuous water spray shall be applied for one hour.		P																				
5.4.2	Evaluation		P																				
	A Type 3R or 3RX enclosure shall be considered to be in compliance with the requirements if at the conclusion of the test there is no accumulation of water within the enclosure and no water has entered the enclosure at a level higher than the lowest live part.		P																				
5.4.2.1	Evaluation Considering Live Parts		N/A																				

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	Water shall be permitted to enter above live parts if the equipment is so constructed that no water is visible on the live parts, insulating material, or mechanism parts, and no water has entered any space within the enclosure in which wiring may be present under any proper installation conditions.		N/A
5.5	Tests for Protection against Ingress of Solid Foreign Objects (Windblown, Circulating and Settling Dust, Lint, Fibers, and Flyings)		
5.5.1	Outdoor (Windblown) Dust Test.	R-BOX-NEMA3, V-BOX-NEMA3: NEMA3 (IP6X)	P
	This test is intended to simulate windblown dust.		P
	A non-ventilated enclosure that complies with the requirements of either the dust blast method or hose method of this test may be considered to also be in compliance with the requirements of 5.5.2.1, 5.5.2.2, 5.2, 5.3, and 5.4.		P
	A ventilated enclosure that complies with the requirements of the Dust Blast Method of this test may be considered to also be in compliance with the requirements of 5.5.2.1 and 5.5.2.2.		N/A
	A ventilated enclosure that complies with the requirements of the Hose Method of this test may be considered to also be in compliance with the requirements of 5.3 and 5.4.		N/A
5.5.1.1	Dust Blast Method		N/A
	The enclosure shall be subjected to a blast of compressed air mixed with dry Type 1 general-purpose Portland cement, using a suction-type sand-blast gun that is equipped with a 4.7 mm (3/16 in.) diameter air jet and a 9.5 mm (3/8 in.) diameter nozzle. The air shall be dry and at a pressure of 620 to 690 kPa (90 to 100 psi).		N/A
	The cement shall be applied at a rate of 2.27 kg/min. (5 lbs./min.). The nozzle shall be held 305 to 380 mm (12 to 15 in.) from the enclosure, and the blast of air and cement shall be directed at all points of potential dust entry, such as seams, joints, and external operating mechanisms. The total volume of concrete sprayed shall be at least 5.9 kg per linear meter of test length (4 pounds per linear foot of test length). The test length is equal to the sum of the height, width, and depth of the test specimen.		N/A
	A conduit shall be permitted to be installed to equalize the internal and external pressures.		N/A
5.5.1.2	Evaluation—Dust Blast Method		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, dust has not entered the enclosure.		N/A
5.5.1.3	Hose Method		N/A
	This test is an alternate to the Dust Blast Method described in 5.5.1.1. The enclosure and its external mechanisms shall be subjected to a stream of water from a hose that has a 25 mm (1 in.) inside diameter nozzle that delivers at least 170 L/min. (45 gal./min.). The water shall be directed at all points of potential dust entry such as seams, joints, external operating mechanisms, and such from a distance of 3.0 to 3.5 m (10 to 12 ft.). The nozzle shall be moved along each test point one time at a uniform nominal rate of 6 mm/sec. (¼ in./sec.). A conduit shall be permitted to be installed to equalize internal and external pressures but shall not serve as a drain.		N/A
5.5.1.4	Evaluation—Hose Method		N/A
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, water has not entered the enclosure.		N/A
5.5.2	Indoor (Circulating and Settling) Dust Tests		P
5.5.2.1	Circulating Dust Test		P
	This test is intended to simulate an indoor industrial environment of circulating dust, lint, fibers, and flyings.		P
	A non-ventilated enclosure that complies with the requirements of this test can also be considered as being in compliance with the requirements of 5.5.2.2, 5.2, and 5.3.		P
	A ventilated enclosure that complies with the requirements of the Dust Blast Method of this test may be considered to also be in compliance with the requirements of 5.5.2.2.		N/A
	A ventilated enclosure that complies with the requirements of the Atomized Water (Method A) of this test may be considered to also be in compliance with the requirements of 5.3.		N/A

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Clause	Requirement – Test	Result	Verdict
5.5.2.1.1	Circulating Dust Methods		P
	For testing circulating dust methods, either Method A or Method B shall be used.	Method B	P
5.5.2.1.1.1	Circulating Dust Method A		N/A
	The enclosure shall be placed in its intended mounting position in an airtight chamber having an internal volume not less than 0.169 m ³ (6 ft. ³). The volume of the chamber shall be not less than 150 percent of the volume of the enclosure under test. The test chamber shall be maintained at ambient room temperature and 20-50 percent relative humidity.		N/A
	At least 1.5 kg of dry Type 1 general-purpose Portland cement per cubic meter of the test chamber (at least 1.5 ounces per cubic foot) shall be circulated by means of a blower suction unit for five minutes so as to completely envelop the enclosure under test. The air velocity at the outlet of the blower is to be maintained at approximately 305 m/min. (1000 ft./min.).		N/A
5.5.2.1.1.2	Circulating Dust Method B		P
	The test is made using a dust chamber incorporating the basic principles shown in Figure 5-3, whereby the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a squaremeshed sieve, the nominal wire diameter of which is 50 µm and the nominal width of a gap between wires 75 µm. The amount of talcum powder to be used is 2 kg per cubic meter of the test chamber volume. Talcum powder shall not be used for more than 20 tests.	2kg	P
	The enclosure under test is supported inside the test chamber, and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump. The suction connection shall be made to a hole specially provided for this test. If not otherwise specified in the relevant product Standard, this hole shall be in the vicinity of the vulnerable parts.		P
	If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole. If there are other holes (for example, more cable inlet holes or drain-holes), these shall be treated as intended for normal use on site.		P

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The object of the test is to draw into the enclosure, by means of vacuum, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour. In no event shall the vacuum exceed 2 kPa (20 mbar) on the manometer shown in Figure 5-3. If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h.	2kPa	P
	If, with a maximum vacuum of 2 kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed.		P
	If it is impracticable to test the complete enclosure in the test chamber, one of the following procedures shall be applied: a. testing of individually enclosed sections of the enclosure; b. testing of representative parts of the enclosure, comprising components such as doors, ventilation openings, joints, shaft seals, etc., in position during the test; c. testing of a smaller enclosure having the same full-scale design details.		N/A
5.5.2.1.1.3	Evaluation-Circulating Dust Method		P
	The enclosure shall be considered to be in compliance with the requirements if at the conclusion of the test no dust has entered the enclosure.		P
5.5.2.1.2	Evaluation—Circulating Dust Method		P
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no dust has entered the enclosure.		P
5.5.2.1.3	Atomized Water Method (Method A)		N/A
	This test is an alternate to the Circulating Dust Method described in 5.5.2.1.1.		N/A
	The enclosure shall be subjected to a spray of atomized water using a nozzle that produces a round pattern 75 to 100 mm (3 to 4 in.) in diameter when measured 300 mm (12 in.) from the nozzle. The air pressure shall be 200 kPa (30 psi). Not less than 4.8 mL/linear cm (5 oz./linear ft.) shall be applied at a rate of 11.4 L/hour (3 gal./hour).		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The nozzle shall be held from 300 to 380 mm (12 to 15 in.) from the enclosure, and the spray of water shall be directed one time at all points of potential dust entry, such as seams. The test specimen shall have at least one seam representative of each of the types of seams of the enclosure(s). A seam is the junction of, or the joint between, two pieces. When two covers or doors are adjacent, their common edges shall be considered a single seam. A conduit shall be permitted to be installed to equalize the internal and external pressures but shall not serve as a drain.		N/A
5.5.2.1.4	Evaluation—Atomized Water Method (Method A)		N/A
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no water has entered the enclosure.		N/A
5.5.2.2	Settling Dust Test		P
	This test is intended to simulate an indoor industrial environment of settling dust, lint, fibers, and flyings. A non-ventilated enclosure that complies with the requirements of this test may also be considered as being in compliance with the requirements of 5.2 and 5.3.		P
5.5.2.2.1	Settling Dust Method		P
	At least 0.85 kg of dry Type 1 general-purpose Portland cement per cubic meter (0.85 ounces per cubic foot) of test chamber (at least is to be circulated by means of a blower suction unit so as to completely envelop the enclosure under test. The air velocity at the outlet of the blower is to be 304.8 m/min. (1000 ft./min.). The blower shall be cycled 15 seconds on and 30 seconds off for seven complete cycles.		P
5.5.2.2.2	Evaluation—Settling Dust Method		P
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no dust has entered the enclosure.		P
5.5.2.2.3	Atomized Water Method (Method B)		N/A
	This test is an alternate to the settling dust method described in 5.5.2.2.1.		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The enclosure shall be subjected to a spray of atomized water using a nozzle that produces a round pattern 75 to 100 mm (3 to 4 in.) in diameter when measured 300 mm (12 in.) from the nozzle. The air pressure shall be 170 kPa (25 psi), and the nozzle shall deliver water at a flow rate of 11.4 L/hour (3 gal./hour).		N/A
	The nozzle shall be held from 460 to 530 mm (18 to 21 in.) away from the enclosure, and the spray of water shall be directed at all points of potential settling dust entry such as seams, joints, external operating mechanisms. A seam is the junction of, or the joint between, two pieces. When two covers or doors are adjacent, their common edges shall be considered a single seam. The nozzle shall be moved along each test point one time at a uniform nominal rate of 11 mm/sec. (7/16 in./sec.).		N/A
	A conduit shall be permitted to be installed to equalize the internal and external pressure but shall not serve as a drain.		N/A
5.5.2.2.4	Evaluation—Atomized Water Test (Method B)		N/A
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no water has entered the enclosure.		N/A
5.6	External Icing Test		P
	This test is intended to simulate freezing rain, sleet, and snow. A Type 3, 3X, 3R, 3RX, 4, 4X, 6, or 6P enclosure that has no external cavities to trap water when mounted in the normal position shall be considered to be acceptable, and testing shall not be required.	no external cavities	P
5.6.1	Test Method		N/A
	The enclosure shall be mounted in a room that can be cooled to -7°C (20°F). A metal test bar that is 25.4 mm (1 in.) in diameter by 600 mm long (24 in.) shall be mounted in a horizontal position in a location where it will receive the same general water spray as the enclosure under test.		N/A
	Provisions shall be made for spraying the entire enclosure from above with water at an angle of approximately 45 degrees from vertical. The water shall be between 0°C and 3°C (32°F and 37°F).		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The room temperature shall be lowered to 2°C (35°F). The spray of water shall be started and continued for at least one hour, maintaining the room temperature between 1°C and 3°C (33°F and 37°F). At the end of this time, the room temperature shall be lowered to between -7°C and -3°C (20°F and 27°F) while continuing the water spray. (The rate of change in the room temperature is not critical and shall be whatever is obtainable within the given range, with the cooling means employed.) The water spray shall be controlled so as to cause ice to build up on the bar at a rate of approximately 6.35 mm/hour (¼ in./hour) and shall be continued until 20 mm (¾ in.) of ice has formed on the top surface of the bar. The spray shall then be discontinued, but the room temperature shall be maintained between -7°C and -3°C (20°F and 27°F) for 3 hours to assure that all parts of the enclosure and ice coatings have been equalized to a constant temperature.		N/A
5.6.2	Evaluation		N/A
	A Type 3S or 3SX enclosure and its external mechanisms shall be considered to be in compliance with the requirements of this test if, while ice-laden, they can be manually operated by one person without any damage to the enclosure, the enclosed equipment, or the mechanism.		N/A
	When an auxiliary mechanism is provided to break the ice, it shall be included and shall be utilized in the test. A separate test is required for each maintained position of each external operator. If necessary, it shall be possible to gain access to the enclosure interior using an appropriate hand tool without causing functional damage to the enclosure.		N/A
	Type 3, 3X, 3R, 3RX, 4, 4X, 6, or 6P enclosure shall be considered to have met the requirements if at the conclusion of the test the enclosures are found to be undamaged after the ice has melted.		N/A
5.7	Test for Protection against Ingress of Water (Hosedown)		N/A
	This test is intended to simulate a hose-down condition.		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	A non-ventilated enclosure that complies with the requirements of this test shall also be considered as being in compliance with the requirements of 5.2, 5.3, 5.4, and 5.5.		N/A
	A ventilated enclosure that complies with the requirements of this test shall also be considered as being in compliance with the requirements of 5.3 and 5.4.		N/A
5.7.1	Test Method		N/A
	The enclosure and its external mechanisms, installed as intended for use in service or in accordance with the manufacturer's instructions, shall be subjected to a stream of water from a hose that has a 25 mm (1 in.) inside diameter nozzle that delivers at least 240 L (65 gal.) per minute.		N/A
	The nozzle shall be held from 3.0 to 3.5 m. (10 to 12 ft.) from the enclosure, and the spray of water shall be directed at all points of potential water entry such as seams, joints, external operating mechanisms, and such. A seam is the junction of, or the joint between, two pieces. When two covers or doors are adjacent, their common edges shall be considered a single seam. The nozzle shall be moved along each test point one time at a uniform nominal rate of 6 mm/sec. ($\frac{1}{4}$ in./sec.).		N/A
	A conduit shall be permitted to be installed to equalize internal and external pressures but shall not serve as a drain.		N/A
5.7.2	Evaluation		N/A
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no water has entered the enclosure.		N/A
5.8	Indoor Corrosion Protection (Rust-Resistance Test (24-Hour Salt Spray Test))		N/A
	Unless the enclosures comply with 3.5.1, the enclosures or representative samples shall be subjected to the test described in 5.8.1-5.8.5 or in <i>ASTM B117</i> .		N/A
5.8.1	Test Equipment		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The test apparatus shall consist of a fog chamber, a salt-solution reservoir, a supply of compressed air, atomizing nozzles, support for the enclosure, provision for heating the chamber, and means of control. It shall not permit drops of solution that accumulate on the ceiling or cover of the chamber to fall on the enclosure being tested, shall not permit drops of solution that fall from the enclosure to be returned to the solution reservoir for re-spraying, and shall be constructed of materials that will not affect the corrosiveness of the fog.		N/A
5.8.2	Salt Solution		N/A
	The salt solution shall be prepared by dissolving 5 parts by weight of salt in 95 parts by weight of either distilled water or water containing not more than 200 parts per million of total solids. The salt shall be sodium chloride that is substantially free of nickel and copper and that contains, when dry, not more than 0.1 percent of sodium iodide and not more than 0.3 percent of total impurities.		N/A
5.8.3	Air Supply		N/A
	The compressed air supply to the nozzle(s) for atomizing the salt solution shall be free of oil and dirt and shall be maintained between 69 and 172 kPa (10 and 25 psi).		N/A
5.8.4	Temperature		N/A
	The temperature of the salt spray chamber shall be maintained between 33°C and 36°C (92°F and 97°F). The nozzle(s) shall be directed or baffled so that none of the spray can impinge directly on the enclosure being tested.		N/A
5.8.5	Test Procedure		N/A
	The chamber shall be closed, and the spray operated continuously except for the short daily interruption necessary to inspect, rearrange, or remove the test specimens, to check and replenish the solution in the reservoir, and to make necessary recordings.		N/A
	The test shall be conducted continuously for 24 hours. At the end of the test, the specimens shall be removed from the chamber and washed in clean running water not warmer than 38°C (100°F) to remove salt deposits from their surface and then dried immediately. Corrosion products, other than rust, shall be permitted to be removed by light brushing if required to observe the condition of the underlying stratum.		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
5.8.6	Evaluation		N/A
	The enclosure shall be considered to comply with the requirements of this test if there is no rust except at those points where protection is impractical, such as machined and mating surfaces of cast enclosures and sliding surfaces such as hinges and shafts.		N/A
5.9	Outdoor Corrosion Protection		N/A
	Finishes other than as described in 3.5.2.1 to 3.5.2.4 or in 3.5.7 shall be tested as described in 5.9.1 and 5.9.3.		N/A
5.9.1	600-Hour Salt Spray Test		N/A
	Comparative tests shall be conducted in accordance with 5.8, except the test time shall be 600 hours.		N/A
	The comparison shall be with G90 galvanized sheet steel (without annealing, wiping, or other surface treatment) conforming with 3.5.2.1.		N/A
5.9.2	Evaluation		N/A
	An enclosure shall be considered to be in compliance with the requirements of this test if upon completion it does not show pitting, cracking, or other deterioration more severe than that resulting from a similar test on G90 galvanized steel.		N/A
5.9.3	1200-Hour Moist Carbon Dioxide—Sulfur Dioxide—Air Test		N/A
	Enclosures, or representative samples, shall be tested and evaluated in accordance with <i>ANSI/UL 1332, Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment</i> .		N/A
5.10	Corrosion Protection—Type 3X, 3RX, 3SX, 4X, or 6P Enclosures		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	A Type 3X, 3RX, 3SX, 4X, or 6P enclosure and external parts attached to the enclosure, or representative parts or plaques thereof, shall be comparison corrosion tested against American Iron and Steel Institute passivated Type 304 stainless steel. Ferrous enclosures, and external ferrous parts attached to these enclosures, fabricated of American Iron and Steel Institute (AISI) Type 302, 303, 304, 305, 309, or 316 austenitic stainless steel and polymeric enclosures shall be considered to be in compliance with these requirements.		N/A
	The test shall be in accordance with 5.9.1, except the test time shall be 200 hours. The evaluation shall be in accordance with 5.10.1. Tested samples are considered to be representative of a complete enclosure.		N/A
5.10.1	Evaluation		N/A
	An enclosure shall be considered to be in compliance with the requirements of this test if upon completion it does not show pitting, cracking, or other deterioration more severe than that resulting from a similar test on passivated American Iron and Steel Institute Type 304 stainless steel.		N/A
5.11	Test for Protection against Ingress of Water (Temporary Submersion)		N/A
	This test is intended to simulate temporary submersion at a limited depth.		N/A
	An enclosure that complies with the requirements of this test can also be considered as being in compliance with the requirements of 5.2.		N/A
5.11.1	Test Method		N/A
	The complete enclosure shall be mounted in a tank with a conduit connected using a pipe-thread sealing compound. The conduit shall be tightened with the torque values specified in Table 5-2.		N/A
	The tank shall be filled with water so that the highest point of the enclosure is 1.8 m (6 ft.) below the surface of the water. After 30 minutes, the enclosures shall be removed from the tank, the excess water removed from the surface of the enclosure, and the enclosure opened.		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	The enclosure need not be submersed to a depth of 1.8 m (6 ft.) if an equivalent pressure differential between the interior and the exterior of the enclosure is maintained for the required period of time. This differential shall be permitted to be achieved either by reducing the air pressure inside the enclosure or pressurizing the water surrounding the enclosure.		N/A
5.11.2	Evaluation		N/A
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no water has entered the enclosure.		N/A
5.12	Test for Protection against Ingress of Water (Prolonged Submersion)		N/A
	This test is intended to simulate prolonged submersion at a limited depth.		N/A
	An enclosure that complies with the requirements of this test can also be considered as being in compliance with the requirements of 5.2 and 5.11.		N/A
5.12.1	Alternate Tests		N/A
	The Internal Pressurization Test in 5.12.1.1 and the External Pressurization Test in 5.12.1.3 are alternate test methods, and either may be conducted.		N/A
5.12.1.1	Internal Pressurization Test		N/A
	The complete enclosure with conduit, pressure gage, and check valve shall be pressure tested. The internal air pressure of the enclosure shall be raised to 40 kPa (6 psig) and the check valve closed. After 24 hours, the pressure shall be checked.		N/A
	The conduit shall be connected using a pipe-thread sealing compound and shall be tightened to the torque specified in Table 5-2.		N/A
5.12.1.2	Evaluation—Internal Pressurization		N/A
	The enclosure shall be considered to be in compliance with the requirements if at the conclusion of the test the internal pressure is a minimum of 26 kPa (4 psig) and there is no permanent deformation of the enclosure.		N/A
5.12.1.3	External Pressurization Test		N/A

ANSI/NEMA 250			
Clause	Requirement – Test	Result	Verdict
	Submerge the complete enclosure, connected as intended for use, in water so that the highest point of the enclosure is 1.8 m (6 ft.) below the surface for a period of 24 hours. The enclosure need not be submerged to a depth of 1.8 m (6 ft.) if the equivalent pressure differential between the interior and exterior of the enclosure is maintained for the required period of time. This differential shall be permitted to be achieved by pressurizing the water around the enclosure to simulate a depth of 1.8 m (6 ft.).		N/A
5.12.1.4	Evaluation—External Pressurization		N/A
	The enclosure shall be considered to be in compliance with the requirements if, at the conclusion of the test, no water has entered the enclosure.		N/A
5.13	Oil Exclusion Test		—
5.14	Gasket Material Tests		—
5.15	High-Pressure Power Wash Test		—

Attachment 1

Measuring equipment list - Shanghai Testing & Inspection Institute for Electrical Equipment CO., LTD.

No.	Description	Model	Equip.	Inte. (mon)	Due date
1	Empty box pressure gauge	DYM-3	JY16061423	12	2024-08-13
2	Temperature and humidity meter	BT-2	D-K20101204	12	2024-08-27
3	Tape measure	3m/1mm	C05	12	2024-08-07
4	flowmeter	LWGY-10B	0441-2351-1	12	2024-11-02
5	Dust resistance test chamber	TMJ-9723	0441-2361	12	2025-03-05
6	IP probe- ϕ 1.0 Test line with baffle	QXB-1	1216-0281-6	12	2024-09-08
7	20N Digital push-pull force meter	HP-20	JY18081409	12	2024-08-17
8	Anti electric shock circuit settings	HL-JT	JY1808013	12	2024-08-27
9	IPX5 injector	D6.3	0441-2351-7	12	2024-08-13
10	Pressure meter	Y60/(0-2.5)bar	0441-2351-2	12	2024-12-18