

Metal X-LOK Series A size Product Specification



1. Scope / 概論

A leading professional solutions provider of waterproof connectors (overmolded with cable, receptacle, field installable) in the industry, Amphenol LTW (ALTW) always fulfills any requirements with high functionality and reliability products; even it is a very special requirement. And it is highly recommended to be applied to harsh environment.

Amphenol LTW (ALTW) 是防水連接器計設及生產的領導者,主要包含線端,板端及現場組裝式連接器以滿足各種使用求及特殊要求,產品具有高效能及高可靠性,非常適合在各種惡劣的環境條件下提供安裝及使用。

This product specification sheet describes the product application in the markets such as Renewable Energy, Industrial

Automation, LED Lighting, Marine, Broadband Wireless Access, Smart Grid, Heavy Equipment, Medical, Electrical Vehicle....etc.

本規範主要描述了 Amphenol LTW(ALTW)產品的應用要求。 本產品廣泛應用於可再生能源，工業自動化，LED，船舶，寬帶無線接入，智能電網，建築機械/重型車輛，醫療設備等，電動車行業....

2. Applicable Documents / 參考文件

2.1 Industry Document / 業界標準

Amphenol LTW (ALTW) 設計及生產的產品符合各項世界標準,包括 IEC, EIA, MIL, NMEA....

3. Specification / 規格

3.1 Material / 材質

Parts / 零件	Material / 材質
Connector / 連接器	Thermoplastic / 熱塑性塑膠
Pin / 端子	Copper Alloy / 銅合金
Nut / 螺帽	Metal / 金屬
Spring / 彈簧	Metal / 金屬
Clamp Ring / 夾環	Thermoplastic / 熱塑性塑膠
O-Ring / O 型環	Rubber / 橡膠
Shield ; Shell / 屏蔽	Metal / 金屬

3.2 Rating / 操作評級

Voltage / 電壓	300V D.C./A.C. ; 300 伏 直流/交流
Current / 電流	2A / 5A ; 2 安培/ 5 安培
Operating Temperature / 操作溫度	Receptacle : -40°C~105°C 攝式-40 度~105 度 Overmolded With Cable : -20°C~80°C 攝式-20 度~80 度 Field Installable: -40°C~105°C 攝式-40 度~105 度
IP / 防水等級	IP 66/ IP 67/ IP68

4. Test Requirement/測試要求

4.1 Appearance/外觀

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Examination of product 外觀檢查	IEC 60512, Test 1a Visual inspection No physical damage 檢查外觀是否有損壞	No defect would impair normal operation 沒有缺陷會影響正常操作

4.2 Electrical/電氣

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Dielectric Withstanding Voltage 耐電壓試驗	IEC 60512, Test 4a AC 500 voltage for 1 minute, 給予固定 AC 500V · 測試 1 分鐘	<ul style="list-style-type: none"> • Current leakage less than 5mA • No physical damage, flashover, sparks, breakdown • 漏電流小於 5mA • 無物理損害, 飛弧, 跳火, 擊穿
Contact Resistance 接觸電阻	IEC 60512, Test 2a Both ends of the contact resistance measurement of male and female specimens (excluding line resistance) 量測公母試件兩端之接觸阻抗(不含線阻)	Need less than 40mΩ 需在 40mΩ 以下
Insulation Resistance 絕緣電阻	IEC 60512, Test 3a, Method A Standard atmospheric conditions Test voltage 500 V ± 15 V d.c. 標準大氣壓力下使用 500 V ± 15 V d.c. 測試	<ul style="list-style-type: none"> • 100MΩ min. • 100MΩ 最小
Temperature Rise Test 溫升試驗	UL1977 section 16.1, Mated connector carry the maximum rated current (table) continuously for 4 hour and measure the temperature rise of contact. UL1977 第 16.1 節, 配合連接器連續輸入最大額定電流 (附件) 4 小時, 測量接觸溫升。	<ul style="list-style-type: none"> • Temperature rise ΔT is no more than Relative Thermal Index of the insulating material • 溫升 ΔT 不大於絕緣材料的相對熱指數
	UL 2238 section 25, Mated connector carry the maximum rated current (table) continuously for 4 hour and measure the temperature rise of contact. 連接器對接後, 額定電流(附件)持續輸入 4 小時, 測量接觸點溫升。	<ul style="list-style-type: none"> • UL : The temperature do not exceed the RTI of insulating material. • CUL : Temperature rise ΔT is no more than 30°C , also for CUL (CSA C22.2 No. 182.3, Clause 6.5) • UL: 溫度不超過絕緣材料的 RTI • CUL: 溫度升高 ΔT 不超過 30°C

4.3 Mechanical/機械

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Durability 耐久性	IEC 60512, Test 9a Standard atmospheric conditions, Max. speed of operations = 10 mm/s, Rest:10s,unmated 最大插拔速率10mm/s, 分離狀態下停留10s	<ul style="list-style-type: none"> • No physical damage • 1000 cycles • 無物理損害 • 滿足 1000 次插拔
Mating force and Un-mating force 插拔力	IEC 60512, Test 13b The connectors shall then be fully mated at a rate of 10 mm/s。when without NUT 連接器插拔速率為 10mm/秒, 不含 NUT	Mating & Un-mating Force: 30N maximum 插入&拔出力: 30N 最大
Vibration 震動試驗	IEC 60512-6-4, Test 6d 10~500Hz, and 0.35mm or 50m/s ² , sweep cycle: 10 cycle on each of the 3 axes , Full duration 6 hrs (2hrs each axis) 頻率 : 10~500Hz, 掃描周期: 每軸向做 10 個循環, 3 個軸向均需測	<ul style="list-style-type: none"> • No physical damages • No electrical discontinuity more than 1μ second. • 無物理損害 • 電氣訊斷不超過 1μsecond
Mechanical Shock 物理沖擊	IEC 60512-6-3, test 6c Half sine shock acceleration 490 m/s ² (50 g) Duration of impact: 11 ms, 3shocks/axis (total 18 shocks) 半正弦衝擊加速度 490 m / s ² ; 持續 11 ms	<ul style="list-style-type: none"> • No physical damages • No electrical discontinuity more than 1μ second. • 無物理損害 • 電氣訊斷不超過 1μsecond

4.4 Environmental/環境

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Temperature Shock 溫度變化	IEC 60512-11d -25 °C to 85 °C, t = 30 min, 5 cycles -25 °C to 85 °C, 時間 30 min, 5 個循環	<ul style="list-style-type: none"> •No physical damages •無物理損壞
Salt Spray 鹽水噴霧試驗	EIA-364-26, 5% salt solution for 48 hours mated. 對插狀態，5%鹽水溶液持續 48 小時。	<ul style="list-style-type: none"> •No physical damages •無物理損壞
Waterproof Test 防水測試	IEC 60529, IPX8 should be immersed in water at depth of at least 1 m for 24 hours. 浸入深度至少 1 米的水中 24 小時。	<ul style="list-style-type: none"> •No physical damages •Visual inspection inside no water •Insulation resistance: >100MΩ •無物理損壞 •目視內部無水侵入 •絕緣電阻：>100MΩ

5. Product Qualification Test Sequence/測試群組及順序

	Test or Examination	Test Group				
		A	B	C	D	E
Examination of product	Visual Examination	1,7	1,6	1,9	1,3	1,6
Electrical	Dielectric Withstanding Voltage	2,5				
	Contact Resistance		2,5			2,5
	Insulation Resistance	3,6		2,4,6,8		
	Temperature Rise Test	4				
Mechanical	Durability		4			
	Mating force and Un-mating force		3			
	Vibration					3
	Mechanical Shock					4
Environmental	Thermal Shock			5		
	Salt Spray				2	
	Flexing Test					
	Waterproof Test			3,7		
Number of test samples 測試樣品數量		6	6	6	6	6

6. Quality Assurance Provisions/品質保證

Unless otherwise specified, in the contract or purchase order, we will be responsible for the quality of the part as it is delivered to client. We will be responsible for having controlled processes to ensure product is in total compliance with this specification. Failing lots shall be subject to return or other corrective action.

除非在合同或採購訂單中另有規定者外，我們將對交付給客戶的部件質量負責。我們將負責控制流程，以確保產品完全符合規格。未通過的批次應退回或採取其他糾正措施。

Re-qualification Testing : 重新資格測試

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

如果對產品或製造過程產生顯著影響的形狀，配合或功能的變化，產品保證應協調重新認證測試，包括由開發/產品，質量和可靠性工程確定的全部或部分的原始測試順序。

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