

# X-LOK Series D 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	Thermoplastic / 熱塑性塑膠, Metal / 金屬
Clamp Ring / 夾環	Thermoplastic / 熱塑性塑膠
O-Ring / O 型環	Rubber / 橡膠
Gasket / 墊圈	
Seal / 密封圈	
Shield/Shell / 屏蔽	Metal / 金屬

### 3.2 Rating / 操作評級

Voltage / 電壓	600V & 300V D.C./A.C. 伏 直流/交流
Current / 電流	2A / 5A/10A/20A/1.5A+50A/50A 2 安培/ 5 安培/ 10 安培/ 20 安培/ 1.5+50 安培/ 50 安培
Operating Temperature / 操作溫度	Receptacle -40°C~105°C 攝式-40度~105度 Overmolded With Cable -20°C~85°C 攝式-20度~85度 Field Installable -40°C~105°C 攝式-40度~105度 Receptacle with cable/wire-20~85°C攝式-40度~85度
IP / 防水等級	P 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	EIA-364-18 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	EIA 364-20 600V rating voltage : AC 2200 voltage for 1 minute, 600V 工作電壓 : 給予固定 AC 2200V , 測試 1 分鐘 300V rating voltage : AC 1600 voltage for 1 minute, 300V 工作電壓 : 給予固定 AC 1600V , 測試 1 分鐘	For one minute at see level 1).No flashover 2).No sparkover 3).No excess leakage(5mA) 4).No insulation breakdown 測試 1 分鐘 1).沒有閃花 2).沒有火花 3).漏電流不可超過 5mA 4).塑膠沒有被擊穿
Contact Resistance 接觸電阻	EIA 364-23 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	EIA 364-21 Supply DC 500 voltage±10% for 1 minutes. 給予固定 DC500V±10%, 1 分鐘	The Insulation Resistant should be more than 100MΩ 絕緣阻抗須達 100MΩ 以上
Temperature Rise Test 溫升試驗	UL1977 section 16.1, Mated connector carry the maximum rated current (2A,5A,10A,20A) 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 ( 2A,5A,10A,20A ) 4 小時, 測量接觸溫升。	Temperature rise $\Delta t$ is no more than Relative Thermal Index of the insulating material 溫升 $\Delta t$ 不大於絕緣材料的相對熱指數

4.3 Mechanical/機械

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Durability 耐久性	EIA-364-09, at rated cycling of 500±50 per hour 插拔速率為每小時插拔 500±50 次。	Terminal 2000 cycles minimum, no physical damage; Pass the sequenced tests 端子插拔壽命最小 2000 次, 無物理損害; 符合群組測試
Mating force and Un-mating force 插拔力	EIA-364-13, The connectors shall then be fully mated at a rate of 25.4 millimeters/minute。when without NUT 連接器插拔速率為 25.4mm/分鐘, 不含 NUT	Mating & Un-mating Force: 70N maximum 插入&拔出力: 70N 最大
Crimp tensile 壓接拉力	EIA-364-8. Determine crimp tensile at a maximum rate of 25 ± 6 mm per minute.	僅適用帶線產品, 參考 UL1977 & UL2238 (針對鉗壓端子定義)
Vibration 震動試驗	EIA-364-28, Test condition I, Frequency: 10~55~10Hz, amplitude : 1.5 mm; Two hours in each of 3 mutually perpendicular planes. 頻率: 10~55~10Hz, 振幅: 1.5mm,每軸向測試 2 小時, 三個軸向平面均需測試	No physical damages No electrical discontinuity more than 1 μ second. 無物理損害; 電氣訊斷不超過 1 μ second
Stain Relief Test 頭帶線拉力試驗	UL1573&UL1598 strain relief test, lasts 1 min	Check the wire no displacement after Strain relief test. ( wire displacement of no more than 1.6mm) 吊重后檢查芯線有無產生位移。 (位移量不超過 1.6mm)

4.4 Environmental/環境

Item / 項目	Test Condition / 測試條件	Requirement / 條件需求
Cyclic Humidity 溫度循環濕性測試	EIA-364-31, RH : 85%,Temperature : -40~105°C , 5 days(1 cycle/day) 濕度 85% , 溫度-40~105°C , 共 5 天(1 循環/1 天)。	Shall meet visual requirement, show no physical damage. 須符合外觀要求且無物理損壞
High Temperature 高溫耐濕性測試	Apply a test at 105°C and 70% RH for 93 hours. 溫度 105°C , 濕度 70% , 持續 93 小時。	No physical damages and shall meet requirements of sequenced tests. 無物理損壞 , 應符合有序測試的要求。
Thermal Shock 冷熱衝擊試驗	EIA-364-32, Test condition VIII, 5 cycles at -40°C to +105°C 溫度-40~105°C 共 5 個循環	No physical damages and shall meet requirements of sequenced tests. 無物理損壞 , 應符合有序測試的要求。
Salt Spray 鹽水噴霧試驗	EIA-364-26, 5% salt solution for 48 hours un-mated. 5% salt solution for 1,000 hours mated. 單顆狀態 , 5%鹽水溶液持續 48 小時。 對插狀態 , 5%鹽水溶液持續 1,000 小時。	No physical damages and meets sequenced tests. 無物理損壞
Flexing Test 彎曲試驗	leftward and rightward each 60° ; 60 cycles/min ; Total 1,000 Cycles,load 500 garm ; R 5cm. 向左和向右各別搖擺角度 60°; 60 次循環/分鐘; 總共 1000 個週期 , 吊重 500 公克; R 5 釐米。	No physical damages and shall meet requirements of sequenced tests. 無物理損壞
Waterproof Test 防水測試	IEC 60529, IPX7: Should be immersed in water at depth of at least 1 m for 30 mintues. IEC 60529, IPX7:浸入深度至少 1 米的水中 30 分鐘。	No physical damages and shall meet requirements of sequenced tests. 無物理損壞 Visual inspection inside no water 目視內部無水侵入 Insulation resistance: >100MΩ 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	F	G	H	I	J	K
		Test Sequence										
Examination of product	Visual Examination	1,7	1,5	1,5	1,3	1,8	1,5	1,8	1,8	1,8	1,5	1,8
Electrical	Dielectric Withstanding Voltage	2,5				2,7		2,7	2,7	2,7		2,7
	Contact Resistance		2,4	2,4			2,4				2,4	
	Insulation Resistance	3,6				3,6		3,6	3,6	3,6		3,6
	Temperature Rise Test	4										
Mechanical	Durability		3									
	Mating force and Un-mating force			3								
	Crimp tensile				2							
	Vibration					4	3					
Environmental	Cyclic Humidity							4				
	High Temperature								4			
	Thermal Shock									4		
	Salt Spray										3	
	Flexing Test											4
	Waterproof Test					5		5	5	5		5

6. Others/其他

6.1 Torque/扭力

Panel Nut / 鎖板 (板端)	11.5~14 kgf.cm
Panel Screw / 鎖板螺絲 (板端)	1.5~2 kgf.cm
Mating Nut (Overmolded With Cable/Field Installable) / 對插 (線端/組裝式)	4~4.5 kgf.cm
Clamp Ring / 接管 (組裝式)	6~8 kgf.cm
Sealing Nut / 尾蓋 (組裝式)	8~15 kgf.cm
Screw of the Screw-in type / 鎖芯線螺絲 (組裝式)	4~5 kgf.cm

7. 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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