

# LPA NIPHAN SYSTEMS



Long Life Reliability  
does not cost the earth



**AIRCRAFT GROUND POWER SUPPLY  
HARNESSES, CONNECTORS  
& CABLE CARRIERS**

[www.lpa-group.com](http://www.lpa-group.com)



# INTRODUCTION

MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE



LPA Group comprises four companies located in Britain, with headquarters near the famous University town of Cambridge, employing nearly 200 people. LPA Group companies are specialist providers of electro-mechanical and electronic solutions for customers serving the global rail, aerospace, telecom, infrastructure and industrial markets. LPA Channel is a specialist supplier of components, LPA Haswell manufactures structures and enclosures, LPA Excil supplies lighting systems, power supplies, inverters and electronic systems and LPA Niphan supplies connectors, electro-mechanical systems and cable management systems. All LPA companies are ISO 9001 certified by the British Standards Institute and are committed to the highest standards of quality to ensure Safety, Performance, Reliability, Availability and Low Life Cycle Cost. All LPA companies are environmentally responsible and have a strong reputation for providing solutions for their customers in benign and hostile environments through out the world.



Die LPA-Gruppe besteht aus vier Unternehmen, die ihre Niederlassung in Großbritannien haben und insgesamt etwa 200 Personen beschäftigen. Der Hauptsitz der Gruppe liegt in der Nähe der berühmten Universitätsstadt Cambridge. Als Spezialanbieter von elektromechanischen und elektronischen Lösungen, die LPA Unternehmen beliefern Kunden aus der globalen Eisenbahn-, Luftfahrt-, Telekommunikations- und Infrastrukturindustrie sowie aus den Industriemärkten. LPA-Channel ist ein Komponentenfachlieferant. LPA-Haswell stellt Baukörper und Schaltschränke aus Metall her. Das Spezialgebiet von LPA-Excil sind Wechselrichter, Beleuchtungs-, Energieversorgungs- und elektronische Systeme. Die Hauptgebiete von LPA-Niphan sind Steckverbinder, Kabelmanagement- und elektromechanische Systeme. Alle vier LPA Unternehmen sind mit der ISO 9001 Zertifizierung des British Standard Institute ausgezeichnet und setzen höchste Qualitätsmaßstäbe um Sicherheit, Effizienz, Verlässlichkeit, Verfügbarkeit und niedrige Lebenszykluskosten zu garantieren. Sie basieren auf umweltverantwortlicher Unternehmensführung und sind dafür renommiert ihren Kunden, in einfachen als auch in schwierigen Situationen, Lösungen anzubieten, und das weltweit.



LPAグループは英国企業4社から構成され、本社は有名なケンブリッジ大学の近くにあります。従業員数はおよそ200名です。LPAグループ企業は、世界中の鉄道、航空、通信、インフラおよび工業マーケットなどの分野の顧客に対して、電子機械と電子的ソリューションを提供するスペシャリストです。LPAチャンネルはコンポーネントを供給するスペシャリストであり、LPAハズウェルは組立・梱包を行い、LPAエクシルは、照明システム、電力、インバーター、電子システムを提供し、LPAナイファンは、コネクタ、電子機械システム、ケーブル制御システムを提供しています。LPAグループのすべての企業は、イギリス規格協会によるISO9001を取得しています。また安全性、性能、信頼性、有効性及び低ライフサイクルコストを保証するクオリティの最高水準を満たしています。LPAグループのすべての企業は、環境対応責任を実現し、世界中のさまざまな環境における顧客に対してソリューションを提供して高い評価を得ています。



El LPA Group consiste de cuatro compañías situadas en Gran Bretaña, con sede en la famosa ciudad universitaria de Cambridge, y emplea casi 200 personas. Las compañías del grupo LPA son suministradores especializados de soluciones electro-mecánicas y electrónicas para clientes que sirven los mercados globales ferroviarios, aeroespaciales, de telecomunicaciones, infraestructurales e industriales. LPA Channel se especializa en el suministro de componentes, LPA Haswell fabrica estructuras y cerramientos, LPA Excil suministra sistemas de iluminación, fuentes de energía, inversores y sistemas electrónicos y LPA Niphan suministra conectores, sistemas electro-mecánicos y sistemas de gestión de cables. Todas las compañías LPA han recibido certificación ISO 9001 del British Standards Institute y se dedican a los niveles más elevados de la calidad, para asegurar Seguridad, Prestaciones, Fiabilidad y Bajo Costo de Ciclo de Vida. Todas las compañías LPA son ambientalmente responsables y tienen una reputación fuerte en la provisión de soluciones a sus clientes para ambientes benignos y hostiles por todo el mundo



Le Groupe LPA est constitué de 4 sociétés en Grande Bretagne, dont les sièges sociaux sont situés près de la fameuse Université de Cambridge, il emploie environ 200 personnes. Les composantes du Groupe LPA sont spécialisées en électromécanique et électronique et travaillent avec des sociétés dans les secteurs Ferroviaires, Aéronautiques, Télécommunications, Infrastructures et Marchés Industriels. LPA Channel est spécialisée dans les composants, LPA Haswell fabrique des structures métalliques, LPA Excil fournit des ensembles d'éclairage, des transformateurs d'alimentation et des systèmes électroniques, LPA Niphan fabrique des connecteurs de puissance, des ensembles électromécaniques et du câblage. Toutes les sociétés LPA sont ISO 9001, certifiées par les Normes de l'Institut Britannique et correspondent aux normes les plus strictes pour assurer la sécurité, les performances, les délais de livraison, aux meilleurs coûts. Toutes les sociétés LPA sont responsables de leurs secteurs d'activités. Elles ont acquis une solide réputation en apportant des solutions à leurs clients malgré une conjoncture mondiale difficile.

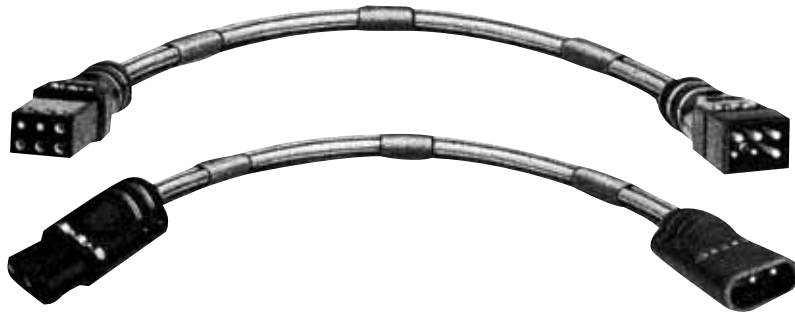


La LPA Group consta di quattro aziende situate nel Regno Unito, aventi sede centrale sita nelle vicinanze della famosa Città universitaria di Cambridge. Il gruppo ha alle proprie dipendenze circa 200 persone. Le società del LPA Group operano in qualità di fornitori specializzati di soluzioni elettromeccaniche ed elettroniche per clienti che offrono servizi globali a vari mercati spazianti dal settore ferroviario, a quello aerospaziale, delle telecomunicazioni, delle infrastrutture e a quello industriale. La LPA Channel è un'azienda che svolge la propria attività nella fornitura di componenti speciali, la LPA Haswell produce strutture e sistemi di chiusura, LPA Excil fornisce sistemi di illuminazione, sistemi di alimentazione, invertitori e sistemi elettronici e la LPA Niphan fornisce sistemi di gestione di collegamenti e connettori elettromeccanici, e di gestione di cavi. Tutte le aziende del gruppo LPA sono certificate ISO 9001 dal British Standards Institute e sono impegnate a garantire i massimi standard in materia di Sicurezza, Prestazioni, Affidabilità, Disponibilità e Basso Costo di Ciclo di Durata. Tutte le società del gruppo LPA operano con il più assoluto rispetto nei confronti dell'ambiente e godono di una forte reputazione nella fornitura di soluzioni ai propri clienti, sia in ambienti favorevoli che ostili, in ogni parte del mondo.



LPA集团由英国境内四家公司组成，总部靠近著名的大学城剑桥，雇员总数近200人。LPA集团公司专业提供各种电力机械和电子技术产品，客户遍及全球，主要服务于铁路、航空、电信、基础建设和工业等市场领域。LPA Channel公司专门供应各种零部件；LPA Haswell公司生产各种结构件和围栏；LPA Excil公司提供各种照明系统、电源供应系统、反相换流器和电子系统；LPA Niphan公司则专业提供各种连接器、电力机械系统和线缆管理系统。LPA旗下所有公司都已获得英国标准协会(British Standards Institute)颁发的ISO 9001认证，在生产过程中采用最为严格的质量标准，确保了产品具有更高的安全性、性能、可靠性、可用性和更低的产品使用寿命成本。LPA旗下所有公司在环境保护方面都具有高度的责任感。LPA集团在业界久负盛名，能够在全球各地各种环境下为客户提供最理想的解决方案。

## TYPE 11 EXTENSION HARNESS



### FEATURES:

- Cable assemblies are quickly manufactured to customer requirements from standard stock components
- Composite cable or 3 or 5 single core cable harnesses
- Connector cable entry weatherproofed with silicone compound after termination
- Single core cable harnesses banded together at 500mm intervals

### PLEASE SPECIFY WHEN ORDERING:

- Socket (which determines voltage, electrical rating and number of poles for the assembly)
- Cable length in metres - eg 10 Metres
- Cable size in square millimetres - eg 70mm<sup>2</sup>
- Cable type - eg single cores or composite
- For Type 12 cable power tails fitted with 10mm lugs as standard
- For Type 11 specify plug (with same voltage, electrical rating and poles as socket)

## ORDER REFERENCE - TYPE 11 EXTENSION CABLES

11/Plug (with same voltage, electrical rating and poles for socket)/socket/cable type (eg composite or single core)/cable size(eg 4 x 70mm<sup>2</sup>)/cable length  
eg: 11/Type 14 /1Plug/Type 410/1 socket/composite/4x95mm<sup>2</sup>/15 metres

## TYPE 12 POWER HARNESSSES

### AC 5 SINGLE CORE CABLE HARNESS & SOCKET



### AC COMPOSITE CABLE & SOCKET



### 28V DC 5 SINGLE CORE CABLE HARNESS & SOCKET



## ORDER REFERENCE - TYPE 12 SOCKET CABLES

12/Socket (determines voltage, electrical rating and number of poles for assembly)  
Cable type (eg composite or single core harness)/cable size (eg 4 x 70mm<sup>2</sup>)/cable length  
eg: 12/Type 400/1/single core/4x95mm<sup>2</sup>/12 metres

## CROCODILE CABLE CARRIER



### FEATURES:

- Available in 6 metre multiples up to 30 metres long
- Rugged construction
- Lightweight – easily manoeuvrable by one person
- Compact stowage envelope 3.6M x 3.6M max
- Easy cable replacement in-situ
- Easy repair and component replacement in-situ
- Up to 4 power outlets
- Left or right handed and swivel cable baskets available
- Integrated steps available

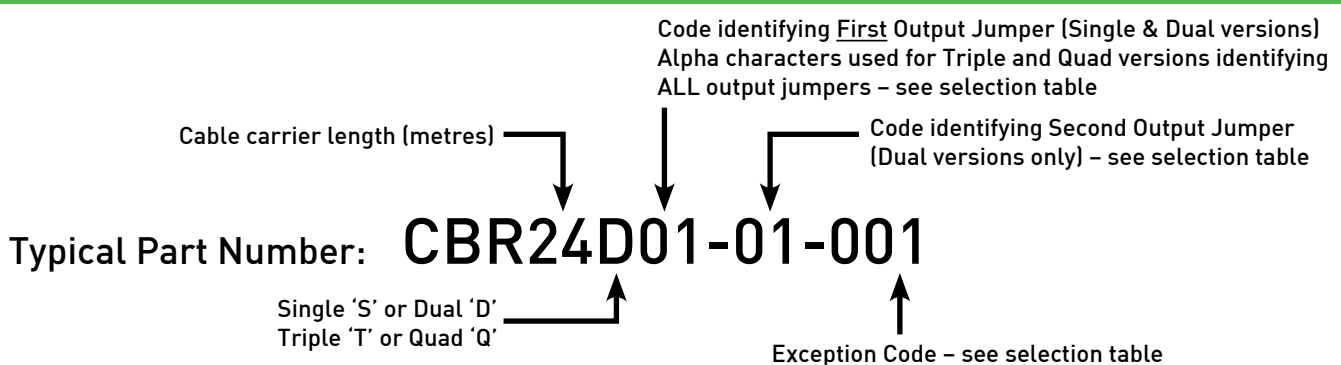




## SELECTION TABLE

OUTPUT CODE	OUTPUT CONNECTOR - LPA NIPHAN PART NO:	DETAILS
01	12/D400/4/6.5/L	E+ F linked
02	12/39339/6.5	7 core control cable – wired for Plug measuring and Neutral supervision
03	12/D400/4/11.5L	E + F linked
04	12/D400/4/6.5	Standard plug assembly
05	12/D400/4/11.5	Standard plug assembly
AA	4-off 12/D400/4/8.5L	Quad output – E + F linked
BB	3-off 12/D400/4/8.5L	Triple output – E + F linked
EXCEPTION CODE	DETAILS	
001	Standard format. Default paint colour (yellow). Default Control Box wiring (Stop switches wired Normally Closed).	
002	As standard format with exception of Universal Joint fitted at fixed end.	
003	As standard format with exception of Stop switches wired Normally Open.	
301	3-off output (Triple) – Standard format. Default Control Box wiring (Stop switches wired Normally Closed).	
303	3-off output (Triple) – As standard format with exception of Stop switches wired Normally Open.	
401	4-off output (Quad) – Standard format. Default Control Box wiring (Stop switches wired Normally Closed).	

## HOW TO ESTABLISH A LPA NIPHAN CABLE CARRIER PART NUMBER



- First letter – always 'C'
- Second letter – indicates trolley format
  - 'B' – basket(s) only
  - 'S' – steps and basket(s)
- Third letter – indicates 'handing' viewed from trolley back towards fixed end (direction of first arm)
  - 'L' – Left-hand version
  - 'R' – Right-hand version

## TYPE D400

FOR 5 SINGLE CORE CABLE HARNESS ENTRY



FOR COMPOSITE CABLE ENTRY  
**TYPE D410**

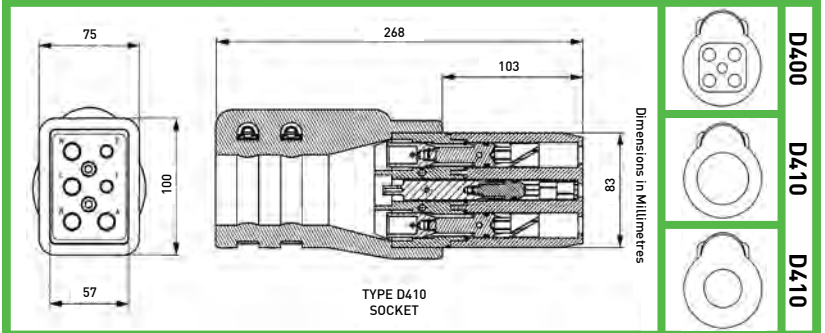
### ELECTRICAL RATING

- Power Components  
450 amps maximum continuous current  
1500 amps maximum 1 minute
- Control components  
35 amps continuous current

### FEATURES:

- Detachable front facilitates rapid in situ replacement of:
  - tubes
  - front mouldings
  - complete fronts
- Front moulding supplied with fixing screws
- Socket supplied complete with screw clips, clamping plates, nuts & bolts
- Crimped or soldered contacts

## TYPE D400 & TYPE D410



### FRONT END ASSEMBLIES

Moulding Only	Moulding with Tubes	Power Tube	Control E/F Tube	Protection Cap
33580	33581	33526	33530	29598

### CABLE DATA FOR D400 5 SINGLE CORE CABLE

Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm Oversheath	
			Min.	Max.
D400/1	4 X 95	HL	14.5	18.0
D400/2	4 X 95	HL	18.0	21.0
D400/3	4 X 70	HK	14.5	18.0
D400/4	4 X 70	HK	18.0	21.0
D400/5	4 X 50/35	HK	11.0	14.5
D400/6	4 X 50/35	HK	14.5	18.0
D400/7	4 X 50/35	HK	18.0	21.0
AD400/4	4 X 70	HK	21.0	24.0

### CABLE DATA FOR D410 COMPOSITE CABLE HARNESS

Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm ø	
			Min.	Max.
D410/1	4 X 95	HL	44	52
D410/2	4 X 70	HL	44	52
D410/3	4 X 50/35	HK	34	43
D410/5	3 X 35/50	HK	34	43
	1 X 25			
D410/6	3 X 70	HK	34	43
	1 X 35/50			
D410/7	4 X 70	HK	34	43

# TYPE 14 PLUG/TYPE 410 SOCKET TYPE 15 PLUG/TYPE 400 SOCKET

115-200 VOLT AC  
400 HERTZ 6 POLE  
CONNECTORS



## ELECTRICAL RATING

- Power Components 450 amps maximum continuous current 1500 amps maximum 1 minute
- Control components 35 amps continuous current

## FEATURES:

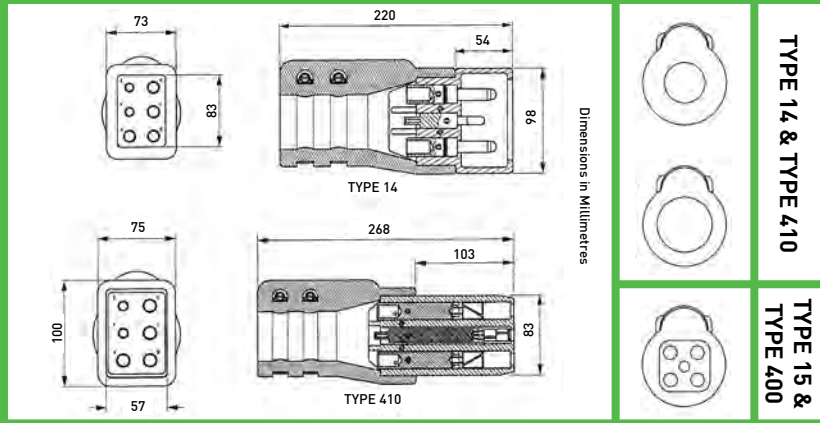
- Rear assemblies complete with screw clips, clamping plates, nuts & bolts
- Front assemblies complete with power & control pins or tubes
- Crimped or soldered contacts
- Optional safety micro switch in 90% F Control Tube ensures proper engagement before power available at aircraft, part no 31441. When ordering add suffix / 90% to socket ref - eg Type 400/1/90%

## TYPE 14 & TYPE 410 FOR COMPOSITE CABLE ENTRY



## FOR 5 SINGLE CORE CABLE HARNESS ENTRY TYPE 15 & TYPE 400

## TYPE 14 & TYPE 410/TYPE 15 & TYPE 400



Control Tube 26375



Control Pin 26675



AC Socket Protection Cap 29598



	Plug Order Ref	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm Min.	Cable Dia. mm Max.	Power Pin	Power Tube	Front Half Plug	Front Half Socket	Rear Half Assembly	5 Hole Bung
CABLE DATA FOR COMPOSITE CABLE HARNESS - TYPE 14 & TYPE 410	14/1	410/1	4 X 95	HL	44	52	28377	27919	28727	28849	27592	-
	14/2	410/2	4 X 70	HK	44	52	26674	26372	27299	27297	27592	-
	14/3	410/3	4 X 50/35	HK	34	43	27884	27767	28726	28850	27236	-
	14/5	410/5	3 X 35/50 1 X 25	HK	34	43	3 X 27884 1 X 44388	3 X 27767 1 X 27766	-	33477	27236	-
	14/6	410/6	3 X 70 1 X 35/50	HK	34	43	3 X 26674 1 X 27884	3 X 26372 1 X 27767	-	33478	27592	-
	14/7	410/7	4 X 70	HK	34	43	26674	26372	27299	27297	27236	-
	CABLE DATA FOR 5 SINGLE CORE CABLE HARNESS - TYPE 15 & TYPE 400	15/1	400/1	4 X 95	HL	14.5	18.0	28377	27919	28727	28849	27589
15/2		400/2	4 X 95	HL	18.0	21.0	28377	27919	28727	28849	27589	18286
15/3		400/3	4 X 70	HK	14.5	18.0	26674	26372	27299	27297	27589	28721
15/4		400/4	4 X 70	HK	18.0	21.0	26674	26372	27299	27297	27589	18286
-		A400/4	4 X 70	HK	21.0	24.0	-	26372	-	27297	43177	37649
15/5		400/5	4 X 50/35	HK	11.0	14.5	27884	27767	28726	28850	27589	27628
15/6		400/6	4 X 50/35	HK	14.5	18.0	27884	27767	28726	28850	27589	28721
15/7	400/7	4 X 50/35	HK	18.0	21.0	27884	27767	28726	28850	27589	18286	

FOR TECHNICAL INFORMATION, NATO STOCK NUMBERS AND CABLE CRIMPING DATA, REFER TO PAGE 13. CONTROL CABLE DIAMETER 11 - 14 mm

MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE



115-200 VOLT AC  
400 HERTZ  
6 POLE CONNECTORS

# TYPE N27 SOCKETS WITH PUSH BUTTON CONTROL

## TYPE N27



### ELECTRICAL RATING

- Power Components  
450 amps maximum continuous current  
1500 amps maximum 1 minute
- Control components  
35 amps continuous current

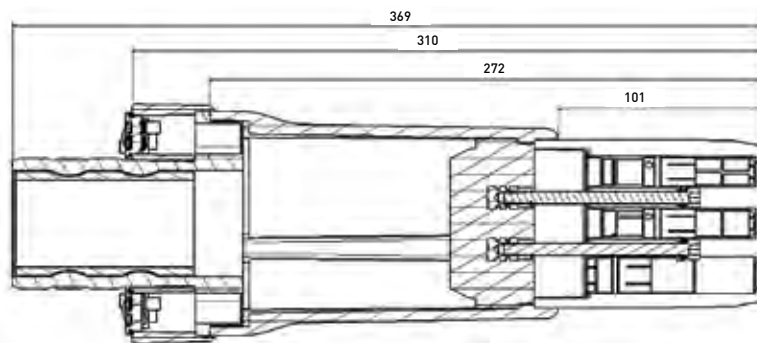
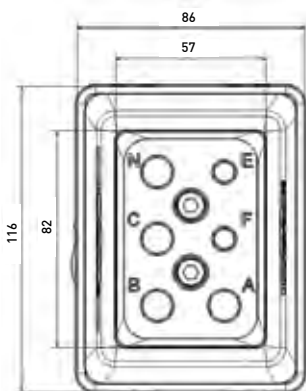
### FEATURES:

- Socket control of power supply
- Optional socket control of cable reel
- Optional indicator lights (upto 4)
- Optional safety micro switch in 90% F Control Tube ensures proper engagement before power available at aircraft - part No 43138
- Complete with Detachable Front for ease of maintenance and longer product life

### FRONT END ASSEMBLIES

Moulding Only	Moulding with Tubes	Power Tube	Control E/F Tube	Protection Cap
44589	43844	33526	33530	29598

## TYPE N27



Dimensions in Millimetres



BUNG 3 x 21



BUNG 38



BUNG 43



# TYPE N27 SOCKETS WITH PUSH BUTTON CONTROL

115-200 VOLT AC  
400 HERTZ  
6 POLE CONNECTORS



## ESTABLISHING N27 AIRCRAFT CONNECTOR PART NUMBERS

The part number for an N27 connector consists of eight sections (A - G), each of which has its own variation. This allows you to construct a unique and individual connector, which is tailored to your own specifications.

<b>N</b>	<b>2</b>	<b>7</b>	<b>/</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
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### A CABLE SIZE FOR THE A, B, C AND N CONTACTS

	A, B and C power contacts	N neutral contact
1	70mm <sup>2</sup>	70mm <sup>2</sup>
2	70mm <sup>2</sup>	35mm <sup>2</sup> / 50mm <sup>2</sup>
3	35mm <sup>2</sup> / 50mm <sup>2</sup>	35mm <sup>2</sup> / 50mm <sup>2</sup>

### B WIRING DETAIL

1	ON (normally open), OFF (normally closed)
2	ON (normally open), OFF (normally open)

### C F CONTROL TUBE

1	Standard solid control tube
2	90% insertion tube with micro switch

**D** Quantity of push buttons - eg 0, 1, 2, 3 or 4

**E** Quantity of LEDs - eg 0, 1, 2, 3 or 4

### F BUNG SIZE

1	To suit cable diameter up to 43mm (supplied as standard). When bung is removed the cable diameter is extended to 52mm
2	To suit 3 x 21mm diameter single core cables
3	To suit cable diameter up to 38mm (supplied as standard). When bung is removed the cable range is extended to 52mm

**G** = Cable length in Metres ie. 6.5 = 6.5 metres

TABLE BELOW SHOWS EXAMPLES OF OPTIONS AVAILABLE

SOCKET REF	CABLE SIZE ABC CONTACTS	CABLE SIZE N CONTACTS	WIRING DETAIL	F CONTROL TUBE	NO OF PUSH BUTTONS	NO OF LEDs	BUNG SIZE
	A		B	C	D	E	F
N27/111211	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	2	1	43 or 52mm
N27/211211	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	2	1	43 or 52mm
N27/211213	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	2	1	38 or 52mm
N27/311213	1x35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	2	1	38 or 52mm
N27/211212	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	2	1	3x21mm
N27/311212	1x35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	2	1	3x21mm
N27/111411	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	4	1	43 or 52mm
N27/211411	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	4	1	43 or 52mm
N27/211413	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	4	1	38 or 52mm
N27/311413	1x35/50mm <sup>2</sup>	1x35/35mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	4	1	38 or 52mm
N27/211412	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	4	1	3x21mm
N27/311412	1x35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	SOLID	4	1	3x21mm
N27/112231	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	2	3	43 or 52mm
N27/212231	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	2	3	43 or 52mm
N27/212233	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	2	3	38 or 52mm
N27/312233	1x35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	2	3	38 or 52mm
N27/212232	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	2	3	3x21mm
N27/312232	1x35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	2	3	3x21mm
N27/112431	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	4	3	43/52mm
N27/212431	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	4	3	43 or 52mm
N27/212433	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	4	3	38 or 52mm
N27/312433	1x35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	4	3	38 or 52mm
N27/212432	1x70mm <sup>2</sup> 2x35mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	4	3	3x21mm
N27/312432	35/50mm <sup>2</sup>	1x35/50mm <sup>2</sup>	ON (normally open) OFF (normally closed)	90%	4	3	3x21mm

MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE

# TYPE 10, TYPE 16, TYPE 18 & TYPE 19 FLANGED PLUGS & SOCKETS

MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE

## TYPE 18 PLUG

115 - 200V 400HZ AC 6 POLE



## TYPE 10 SOCKET

## TYPE 19 PLUG

28V DC 3 POLE



## TYPE 16 SOCKET

### ELECTRICAL RATING

- Power Components  
450 amps maximum continuous current  
1500 amps maximum 1 minute
- Control components  
35 amps continuous current

### FEATURES:

- Cast aluminium alloy housing & lid
- Epoxy powder coated orange
- Interior manufactured to ISO 461
- Assemblies complete with power and control pins or tubes
- Lid incorporates connector retaining tongue with padlocking facility
- Weatherproof to IP54
- Crimped or soldered contacts (soldered only in double ended contacts)

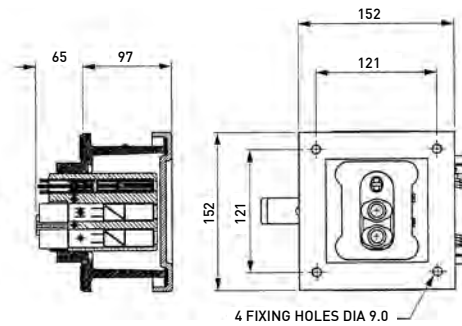
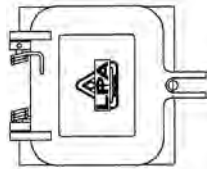
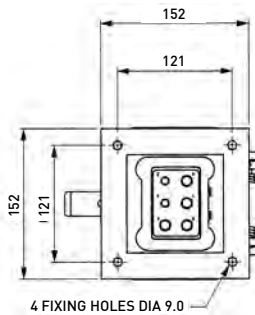
SPLIT CONTROL TUBE 13196



SPLIT CONTROL PIN 28715



TYPE 18 PLUG & TYPE 10 SOCKET



Dimensions in Millimetres

TYPE 19 PLUG & TYPE 16 SOCKET

28V DC 3 POLE DATA				Single End Plug Front	Double End Plug Front	Single End Pin	Double End Pin	Single End Tube	Double End Tube	Single End Socket Front	Double End Socket Front
Plug Order Ref	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size								
19/1	16/1	2 X 120	HM	28710	-	28707	-	28686	-	28682	-
19/2	16/2	2 X 95	HL	28712	-	28708	-	27920	-	28683	-
19/3	16/3	2 X 70	HK	28713	-	28709	-	26373	-	28684	-
19/4	16/4	2 X 50/35	HK	28714	-	28710	-	27089	-	28685	-
19/6	16/6	4 X 95/70	-	-	28717	-	28715	-	21362	-	28704
19/8	16/8	4 X 50/35	-	-	28718	-	28716	-	28706	-	28705

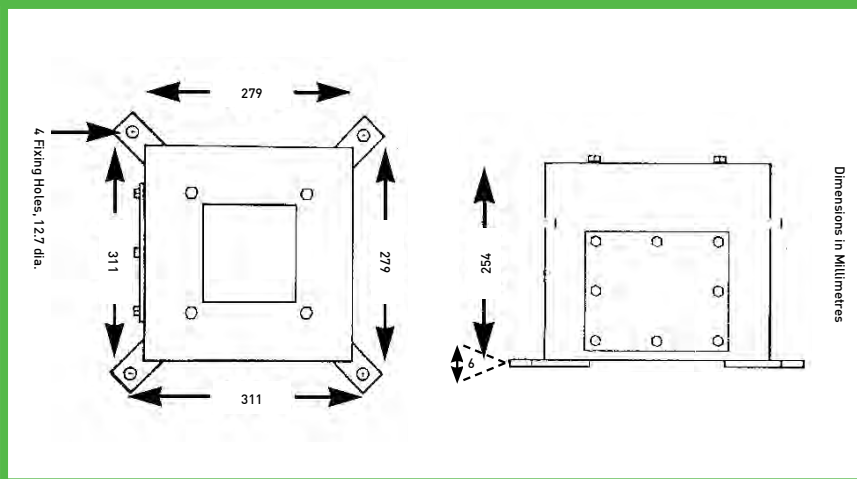
115-200V AC 400HZ 6 POLE DATA				ASSEMBLIES					
Plug Order Ref	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Power Pin	Power Tube	Control Pin	Control Tube	Front Half Socket Assembly	Front Half Plug Assembly
18/1	10/1	4 X 95	HL						
18/2	10/2	4 X 70	HK	26674	26373	26675	26374	27298	27299
18/3	10/3	4 X 50/35	HK	27884	27089	26675	26374	27418	28726

FOR TECHNICAL INFORMATION, NATO STOCK NUMBERS AND CABLE CRIMPING DATA, REFER TO PAGE 13. CONTROL CABLE DIAMETER 11 - 14 mm

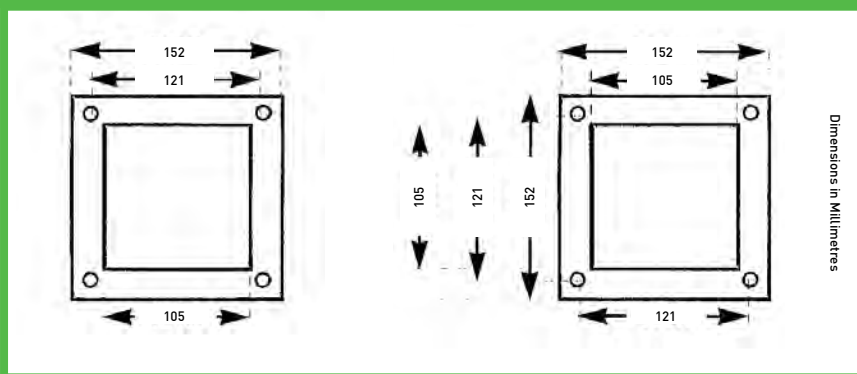
## FEATURES:

- Designed for use with flanged connector Types 10, 16, 18 & 19
- Weatherproof to IP54 with flanged connector installed
- Manufactured in mild steel, zinc sprayed and polyester powder coated orange
- Cuboid design with side entry allows orientation to meet installation requirements
- Type 27121 gland plate accommodates most cable types and sizes
- Type 27121 supplied with flanged connector fixing bolts
- Type 27012 supplied with fixing bolts and sealing gasket

## TYPE 27121 SURFACE BOX



## TYPE 27012 ANGLE ADAPTOR BOX



## TYPE 27121 SURFACE BOX



## TYPE 27012 ANGLE ADAPTOR BOX





**28 VOLT DC  
3 POLE  
CONNECTORS**

**TYPE 20, TYPE 23 & TYPE 21 PLUGS  
TYPE M1 & TYPE M3 SOCKETS**

**ELECTRICAL RATING**

- Power Components  
450 amps maximum continuous current  
1500 amps maximum 1 minute
- Control components  
35 amps continuous current

**FEATURES:**

- Composite or 3 or 5 single core harness entry
- Split control pins & tubes
- Square bung fitted with removable plug to accommodate control cable
- Rear assemblies complete with screw clips, clamping plates, nuts & bolts
- Front assemblies complete with power & control pins or tubes
- Optional solid control pin or tube, if required add suffix 'S' - eg M1/IS
- For rear assembly 28723 specify bung reference according to number and size of cable
- Crimped or soldered contacts

**TYPE 20 PLUG & TYPE M1 SOCKET  
FOR COMPOSITE CABLE ENTRY**



**TYPE 21 PLUG & TYPE M1 SOCKET  
FOR 3 SINGLE CORE CABLE HARNESS ENTRY**



**SOCKET & PLUG**



**SPLIT CONTROL  
TUBE 13196**



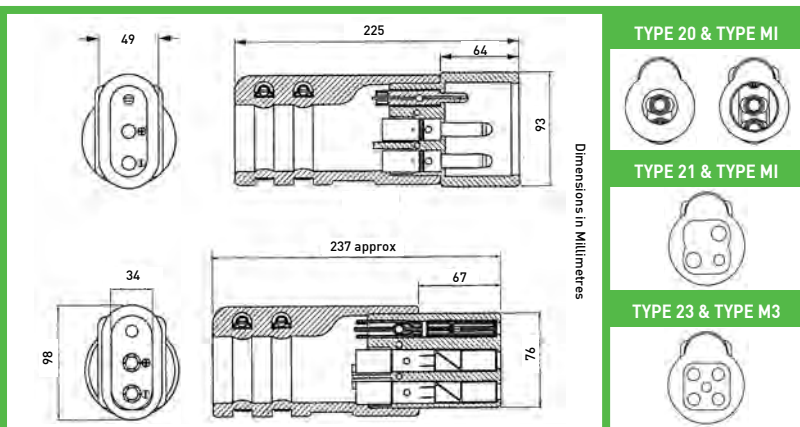
**SPLIT CONTROL  
PIN 29176**



**DC SOCKET PROTECTION  
CAP 29597**



**TYPE 23 PLUG & TYPE M3 SOCKET  
FOR 5 SINGLE CORE CABLE HARNESS ENTRY**



FOR TECHNICAL INFORMATION, NATO STOCK NUMBERS AND CABLE CRIMPING DATA, REFER TO PAGE 13. CONTROL CABLE DIAMETER 11 - 14 mm






MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE










# TYPE 20, TYPE 23 & TYPE 21 PLUGS TYPE M1 & TYPE M3 SOCKETS

28 VOLT DC  
3 POLE  
CONNECTORS



TYPE 20 PLUG & TYPE M1 SOCKET	CABLE DATA FOR COMPOSITE CABLE HARNESS						Power Tube	Power Pin	Single End Socket Front	Single End Plug Front	Rear Half
	Plug Order Ref	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm Oversheath ø						
20/A	M1/A	2 X 120	HM	41	54	28686	28707	28682	28711	28703	
20/B	M1/B	2 X 95	HL	41	54	27920	28708	28683	28712	28703	
20/C	M1/C	2 X 70	HK	29	40	26373	28709	28684	28713	28701	
20/D	M1/D	2 X 50/35	HK	29	40	27089	28710	28685	28714	28701	

TYPE 21 PLUG & TYPE M1 SOCKET	CABLE DATA FOR 3 SINGLE CORE CABLE HARNESS											3 Hole Bung 
	Plug Order Ref	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm Oversheath ø							
21/1	MI/1	2 X 120	HM	15.5	20.0	28686	28707	28682	28711	28723	28678	
21/2	MI/2	2 X 120	HM	20.0	24.5	28686	28707	28682	28711	28723	28679	
21/3	MI/3	2 X 120	HM	24.5	29.0	28686	28707	28682	28711	28723	28680	
21/4	MI/4	2 X 95	HL	15.5	20.0	27920	28708	28683	28712	28723	28678	
21/5	MI/5	2 X 95	HL	20.0	24.5	27920	28708	28683	28712	28723	28679	
21/6	MI/6	2 X 95	HL	24.5	29.0	27920	28708	28683	28712	28723	28680	
21/7	MI/7	2 X 70	HK	11.0	15.5	26373	28709	28684	28713	28723	28677	
21/8	MI/8	2 X 70	HK	15.5	20.0	26373	28709	28684	28713	28723	28678	
21/9	MI/9	2 X 70	HK	20.0	24.5	26373	28709	28684	28713	28723	28679	
21/10	MI/10	2 X 50/35	HK	11.0	15.5	27089	28710	28685	28714	28723	28677	
21/11	MI/11	2 X 50/35	HK	15.5	20.0	27089	28710	28685	28714	28723	28678	
21/12	MI/12	2 X 50/35	HK	20.0	24.5	27089	28710	28685	28714	28723	28679	

TYPE 23 PLUG & M3 SOCKET	CABLE DATA FOR 5 SINGLE CORE CABLE HARNESS						Double Power Tube 	Double Power Pin 	Double End Socket Front 	Double End Plug Front 	Rear Half 	5 Hole Bung 
	Plug Order Ref	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm Oversheath ø							
23/3	M3/3	4 X 70/95	SOLDERED CONTACTS ONLY	14.5	18.0	21362	28715	28704	28717	28723	28721	
23/4	M3/4	4 X 70/95		18.0	21.0	21362	28715	28704	28717	28723	18286	
23/5	M3/5	4 X 50/35		11.0	14.5	28706	28716	28705	28718	28723	27628	
23/6	M3/6	4 X 50/35		14.5	18.0	28706	28716	28705	28718	28723	28721	
23/7	M3/7	4 X 50/35		18.0	21.0	28706	28716	28705	28718	28723	18286	

FOR TECHNICAL INFORMATION, NATO STOCK NUMBERS AND CABLE CRIMPING DATA, REFER TO PAGE 13. CONTROL CABLE DIAMETER 11 - 14 mm

MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE



115-200 VOLT AC  
400 HERTZ  
6 POLE CONNECTORS

# TYPE 40 & TYPE 41 SOCKETS

MAKING THE RIGHT CONNECTION ON AIRPORT APRONS WORLDWIDE

## TYPE 40 FOR 5 SINGLE CORE CABLE HARNESS ENTRY



## FOR COMPOSITE CABLE ENTRY TYPE 41

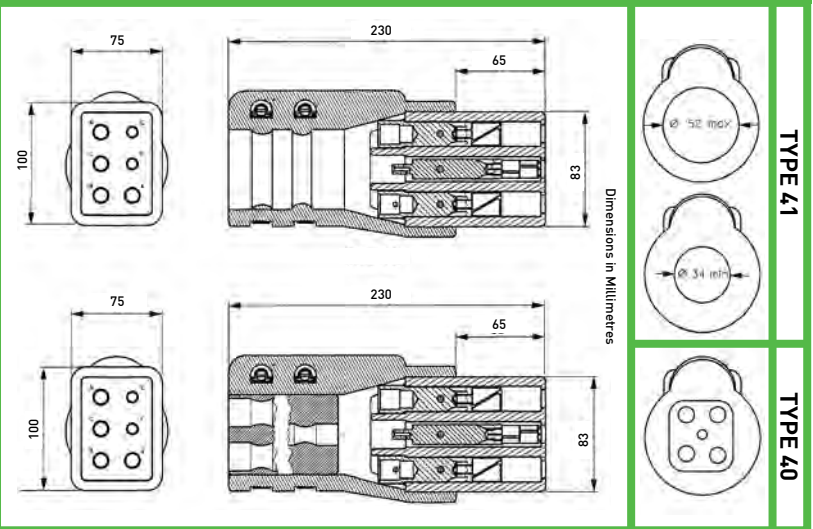
### ELECTRICAL RATING

- Power Components  
450 amps maximum continuous current  
1500 amps maximum 1 minute
- Control components  
35 amps continuous current

### FEATURES:

- Rear assemblies complete with screw clips, clamping plates, nuts & bolts
- Front assemblies complete with power & control tubes
- For type 40 rear assembly specify bung reference according to cable size
- Crimped or soldered contacts

## TYPE 40 & TYPE 41



	CABLE DATA				ASSEMBLIES			
	Socket Order Ref	Cable Size mm <sup>2</sup>	LPA Crimp Size	Cable Dia. mm Oversheath Min.   Max.	5 Hole Bung	Power Tube	Front Half	Rear Half
5 SINGLE CORE CABLE HARNESS - TYPE 40	40/1	4 X 95	HL	14.5   18.0				
	40/2	4 X 95	HL	18.0   21.0	18286	27920	28845	27589
	40/3	4 X 70	HK	14.5   18.0	28721	26373	27298	27589
	40/4	4 X 70	HK	18.0   21.0	18286	26373	27298	27589
	40/5	4 X 50	HK	11.0   14.5	27628	27089	27418	27589
	40/6	4 X 50/35	HK	14.5   18.0	28721	27089	27418	27589
	40/7	4 X 50/35	HK	18.0   21.0	18286	27089	27418	27589
COMPOSITE CABLE HARNESS - TYPE 41	41/1	4 X 95	HL	44   52	-	27920	28845	27592
	41/2	4 X 70	HK	44   52	-	26373	27298	27592
	41/3	4 X 50/35	HK	34   43	-	27089	27418	27236

### CONTROL TUBE 26374



### SOCKET PROTECTION CAP 29598



## SPECIFICATION

Performance and dimensions of LPA Niphan Systems Aircraft Ground Power Supply Connectors are to ISO 461 and to appropriate Ministry of Defence (Air) and NSN standards.

## GENERAL ASSEMBLY

Tubes and Pins are retained in the rubber housing by nylon fixing pins. Front and rear housings are secured together by Glass Filled Nylon or Austenitic Stainless Steel clamp plates and Stainless Steel clamp plates and Stainless Steel nuts and bolts, facilitating disassembly and easy access to pins and tubes when attaching the cable. The connector is secured to the cable by two stainless steel screw clamps providing excellent strain relief and weatherproof seal.

A shrink down sleeve covering the cable entry and rear housing can be supplied as an option.

## FRONT AND REAR HOUSINGS

Housings are moulded or machined from Nitrile PVC or Hypalon, compounds selected for their resistance to UV light, moisture, chemicals and other hazards and wear and tear associated with aircraft maintenance areas, with a temperature range of -40c to 100c.

## POWER AND CONTROL PINS AND TUBES

Pins and Tubes are machined in copper and silver plated to improve electrical conductivity. Tubes are spring tightened to ensure good electrical contact to ISO 461.

## LANYARD ASSEMBLY

Use of the LPA Lanyard Assembly Ref 29570 relieves the Aircraft socket from strain due to the weight of the cable. The Assembly is supplied complete to customer's requirements.

## CABLE TERMINATION

### Power Pins and Tubes

With the exception of the Type M3 and Type 23 connectors, which must be soldered, power pins and tubes may be connected to cables by soldering or crimping. Termination Guide Ref 29273. Available on request.

### CONTROL PINS AND TUBES

With the exception of the Split Design F tube on 28 Volt DC connectors, which must be soldered, control tubes and pins may be connected to cables by soldering or crimping.

The electrical and load test approvals to BS 4G 178, ISO 461 require the use of the appropriate crimping die as shown in the product selection charts. Conductors under 2mm will require doubling over to provide a satisfactory crimped connection. LPA crimping dies and tools are available on request.

Crimping tests have been conducted using conductor sizes shown in tables in BS638. Oversheath dimensions are for cables to BS638, BS6004 and BS6007. Control cables are to BS6500.

The shrink down sleeves, supplied as standard by LPA, should be fitted over the connection and cable end of all power pins and tubes.

It is recommended that, following connection but before mating front and rear assemblies together, the rear assembly is filled with Ambersil RTV Silicon Sealant 1039N to prevent any possible moisture ingress.

## NATO STOCK NUMBERS FOR COMPONENTS

NATO No.	Description
5935-99-551-2589	Socket Type 40/2
5935-99-758-1104	Socket Type 40/4
5935-99-192-2528	Socket Type 40/6
5935-99-785-7295	Socket Type 40/8
5935-99-434-9740	Socket Type 41/3
5935-99-732-2341	Socket Type 400/3
5935-99-574-4640	Socket Type 400/4
5935-99-574-4640	Socket Type D400/4
5935-99-126-2607	Socket Type 410/2
5935-99-690-6725	Socket Type 410/3
5935-99-437-2071	Socket Type D410/2
5935-99-203-1199	Socket Type M1/C
5935-99-770-3267	Socket Type M1/5
5935-99-010-0617	Socket Type M1/7
5935-99-434-9738	Socket Type M3/3
5935-99-244-2408	Socket Type M3/4
5935-99-608-3168	Socket Type 10/2
5935-99-810-3422	Plug Type 15/4
5935-99-282-4558	Plug Type 18/2
5935-99-461-3781	33580 Moulding
5935-99-551-0426	33526 Power Tube
5935-99-498-8657	Tube Sub-Assembly 33530
5935-99-867-8041	AC Socket Cap 29598
5935-99-192-6707	11945 Retaining peg AC all tubes
5935-99-192-6693	13175 Retaining Peg DC Main Tubes
5935-99-192-6692	13176 Retaining Pin DC Control Tube
5935-99-193-2920	13196 Control Tube DC Split Pin Type
5999-99-205-4971	26374 Control Tube AC Sockets
5999-99-117-8495	21362 Main Tube 70mm Cable Twin
5999-99-528-3584	26373 Main Tube 70mm
5999-99-301-2920	27089 Main Tube 35/50 Cable
5999-99-051-8636	27920 Tube Assembly

## CABLE CRIMPING DATA

Cable Size	Die No	Code	Code
120 sq mm	31152	M120	HM
95 sq mm	31151	L95	HL
25-70 sq mm	30732	K70	HK
E-F	30254	F10	HF

LPA Group plc reserves the right to modify designs and specifications so as to permit the incorporation of technical developments.



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FM 01660

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