# Amphenol SOCAPEX

# SL61 & "SOCA" Circular connectors for Showbiz & Industry



#### **ABOUT AMPHENOL SOCAPEX**



#### Proven excellence in interconnect solutions

Since **1947**, Amphenol Socapex has prescribed, designed and manufactured reliable and innovative interconnection solutions for **harsh environments**, specializing in standard and customized electrical and fiber optic connectors, contacts, accessories and cabling solutions.

Located in the **Mont Blanc** region of France and Pune in India, Amphenol Socapex has a presence in over 100 countries around the world.

Amphenol Socapex is part of the international **Amphenol Corporation**.



1000+ employees



Net Sales 2019: **86,6 M€** 69% Export - 31% France



Two facilities : **Thyez** (France), **Pune** (India)

# 1947

- Socapex creation in Suresnes, France
- 1st radio connector

#### 1956-57



- Manufacturing unit in Cluses (74)
- Thomson-CSF becomes primary shareholder

#### **Early 1960's**



- 1st board level connectors: HE8 1st "licence Bendix" manufactured
- 1st "licence Bendix" manufacture connectors

INNOVATION

- SL Series launch

#### 1973



- New factory 13 000 m² in Thyez (74) France with 250 people

#### 1975



- Production of 38999 connectors

**Fiber optics** 

#### 2014-2017







Quadrax Contacto

- New Cable Assembly workshop - New Contact Manufacturing workshop

#### Today and tomorrow | New technologies

# | | New technologie



Miniaturization

Rugged Ethernet

Power

Fiber optics ROHS solutions

Advanced Materials (composite)

#### INTERNATIONAL EXPERTISE



# Our expertise has no boundaries

#### **Integrated Production in France & India**

- 24 000 m<sup>2</sup> manufacturing capacity on 2 sites
- Design centers in France and India
- State-of-the-art manufacturing technology



#### **Our markets**



Communication Systems - Radios - C4ISR / Ground vehicles - Vetronics / Marine / Missiles



Commercial & military / Avionics / Engines / Landing gear / Actuators



# Today and tomorrow | Sustainable development



#### Respect for nature and the environment

Recycling Goodwill

Goodwill Optimization of natural resources
Waste Management

#### PRODUCING FASTER, SMALLER, STRONGER CONNECTORS...



# **Technologies & innovation**



**Engineering Laboratory for product** testing and qualification, product expertise and metrology

- Mechanical and electrical skills
- RF and fiber optics expertise



Strong expertise in high-speed signals

- 3D EM simulation software & EM models
- Time Domain and frequency domain (VNA 20GHz, TDR and eye diagram)



Focus on materials expertise and manufacturing techniques to produce faster, smaller and stronger products

- 3D CAD mechanical software, simulation & analysis
- Disruptive metal alloys, additive manufacturing



Sustainable environment approach, with pro-active management of regulations (REACH / RoHS / Conflict minerals...)

- New materials development, plating, and suitable processes
- Recycling and rational resources consumption

# **Our workshops**

Our workshops located in France & India provide consistent quality adapted to your volume requirements.

**Tooling:** Tools for our different activities: molding, machining, assembly Molding: Solid expertise in thermoplastic elastomer and thermoset molding

Machining: Manufacturing of cylindrical shells from 10 to 90 mm in diameter and rectangular shells

Screw Machining: Cylindrical production parts up to 10 mm in diameter

Plating: Plating with cadmium, nickel, electroless nickel, silver, black zinc nickel, gold

Assembly: Connector and harness assembly (electrical & optical)

#### Our certifications













Product certifications: MIL-DTL38999, EN3645, EN3155, VG

# Our memberships











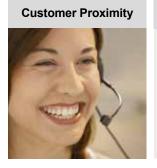
Member of CMG (Connecting Manufacturing Group) Consortium

#### **DELIVERING GREAT CUSTOMER EXPERIENCE**



▶ We have a strong reputation for helping customers solve their toughest challenges. This approach of serving your needs is ingrained in our company – from our sales team to our product development engineers.

# A partner you can trust











# **Buy our solutions**

You can access our solutions through our global network of sales offices or through our distributors.

#### Field Sales Team:

12 in France

🤽 15 in Europe

100+ in North America and rest of the world.5 Business Development Managers supporting local sales force

Europe, North America and the rest of the world

Technical Support & Multilingual Customer Service : 15 people

#### **Worldwide Distribution Network:**

Including qualified distributors (QPL approved) for assembling : MIL-DTL-38999, PT/451/VG95328 & Fiber Optics connectors



#### **SL61 & SLG419AR "SOCAPEX"**

#### **Circular Connectors for Showbiz & Industry**

# **Description**

Connectors made of aluminum alloy, with excellent reliability and robustness for In/Out applications & power supply





#### **Main features**

**ROBUSTNESS AND RELIABILITY** 

HIGH STRENGTH-WEIGHT RATIO

**UL RECOGNIZED (419AR & 37Y)** 

#### **CONNECTOR BODY VERSIONS**

- Plua
- Receptacle
- Receptacle with locking ring
- Inline receptacle

#### SPLIT BACKSHELL & MONOPIECE BACKSHELL AVAILABLE

#### **BACKSHELL OPTIONS**

- -Two-part backshells
  - Efficient cable clamp
  - Simple wiring and maintenance
  - Straight or right angle, all sizes
- IP67 monopiece backshell for 419AR
  - Outdoor application

#### **ORIGINAL MANUFACTURER OF "SOCAPEX" CONNECTORS**

#### STAGE LIGHTNING / ENTERTAINMENT : THE "SOCA"

- 19 pins SLG 419AR for stage lightning and dimmers
- 7 pins SL 37Y (particulary for hoist motor applications)

#### **INDUSTRIAL ARRANGEMENTS**

- 4 shell sizes (#10, #20, #30, #40)
- 14 arrangements available including grounding version of 419AR (SLG 419AR)

#### NON CONDUCTIVE AND CONDUCTIVE SHELLS

- ROHS versions
  - Black non conductive coating
  - Nickel conductive plating
- Non ROHS
  - White conductive cadmium for connector body

# **Product range**





mates with



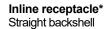
Plug\*

Right angle backshell



Plug\*

Straight backshell





mates with



Receptacle Locking ring



Plug\*

Right angle backshell



Plug\*

Straight backshell

\*connector body or kit (connector body + 2 parts backshell)

#### SL61 & SLG419AR "SOCAPEX" SERVE VARIOUS APPLICATIONS, INCLUDING:



Entertainment



Power distribution



Automatisation



Transport



Instrumentation



Robotic

#### TECHNICAL CHARACTERISTICS - SL

#### **Circular Connectors for Showbiz & Industry**

# **Material and platings**

#### SHELL:

- Light aluminum alloy, molded

#### **INSERTS:**

- Molded in thermoplastic

#### **SOLDER CUP CONTACTS**

- Standard contacts with gold plated size 08, 12, 16, 20
- Socket contact:
  - Protected by a closed entry
  - To ensure an outstanding safety in use

#### **ACCESSORIES:**

- Caps: thermoplastic
- Sealing sleeve: neoprene





#### **Technical characteristics**

Working temperature: - 40°C / + 85°C

Current capability: 7,5 A, 10 A, 25 A and 50 A

Working voltage: Up to 500  $V_{\rm RMS}$ 

UL recognition n° E160967(01) for 37Y & 419AR arrangement only

Monopiece backshell available with IP67 rating

# **Solder cup contacts**

Contact size (AWG)	Nominal current (A)	Contact resistance	Contact cross sectional area
20	7,5	≤ 5mΩ	0,75mm²
16	10	≤ 2mΩ	1,75mm²
12	25	≤ 2mΩ	5,1mm²
8	50	≤ 2mΩ	13mm²

# **Platings**





Black coating

Nickel

# **SL61 - INSERT ARRANGEMENTS**

#### Front face of pin insert shown

Contact size (AWG)	θ	$\oplus$	•	•
Caption	20	16	12	8

# Size 10





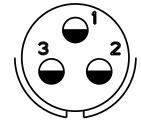
SL61
Contact size
Working voltage (Vrms)
Test voltage at sea level
(Vrms)

13 U
16
280
1400

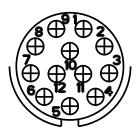
14 V	
 16	
 225	
1400	

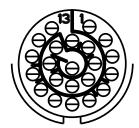
17 P
20
150
1050

# Size 20









SL61
Contact size
Working voltage (Vrms)
Test voltage at sea level (Vrms)

23 C
12
440
1400

25 D
16 & 12
380
1400

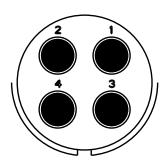
212 AF
16
280
1050

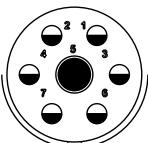
222 P
20
150
1050

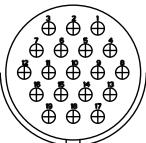
# **SL61 - INSERT ARRANGEMENTS**

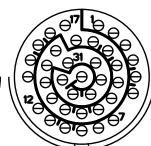
#### Front face of pin insert shown

Caption	20	16	12	8	
Contact size	$\Theta$	$\oplus$	•	•	









# Size 30

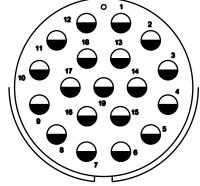
SL61
Contact size
Working voltage (Vrms)
Test voltage at sea level
(Vrms)

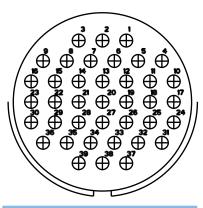
34 H
8
500
1750

37 Y
8 & 12
480
1750

319 L	
 16	
 400	
1750	

337 P
 20
 175
 1050





# Size 40

SL61
Contact size
Working voltage (Vrms)
Test voltage at sea level
(Vrms)

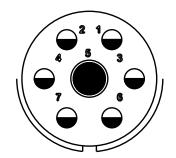
419 AR
12
400
1750

439 R
16
280
1750

# **SL SHOWBIZ "SOCA" - INSERT ARRANGEMENTS**

#### Front face of pin insert shown

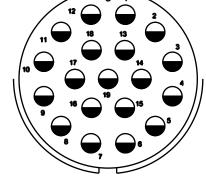
Caption	20	16	12	8
Contact size (AWG)	$\Theta$	$\oplus$	•	•



#### Size 30

SL61
Contact size
Working voltage (Vrms)  Test voltage at sea level (Vrms)

37 Y
8 & 12
480
1750



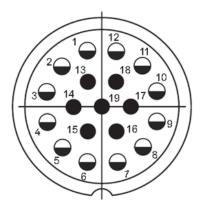
#### Size 40

SL61
Contact size
Working voltage (Vrms)
Test voltage at sea level
(Vrms)

419 AR
12
400
1750

# **SLG 419AR grounding receptacle**

- Derived from SL series
- Safety of the user and the equipment (ground)
- 7 socket first mate last break earth contacts (grounding function)
  - Identified by their plating
  - Improved cabling process
  - Quick visual differentiation from regular SL419AR
- 2x6 sockets, nominal current 25A each (power supplies of 6 brand-lights with independent grounding)
- Mating by reinforced screwing system
- Nominal current: 25 A
- Contact resistance < 0,002 Ohm
- Solder pot internal diameter: 2,5 mm



400 1750

# Size 40

#### Front face of socket insert shown

SLG	
•••••••••••••••••••••••••••••••••••••••	•••••
Contact size	
Working voltage (Vrms)	
Test voltage at sea level (Vrms)	

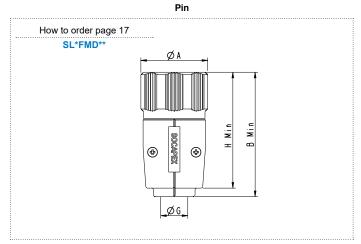
First	mate	last	break	earth	contacts	:

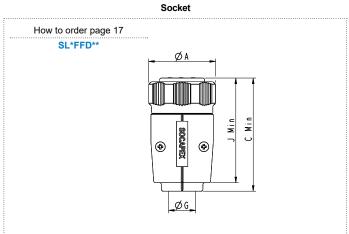


# **SL61 & "SOCA"**

# **Straight plug**





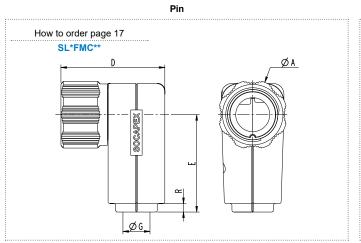


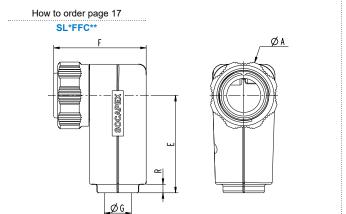
Size	B <sub>MIN</sub>	C <sub>MIN</sub>		ØG*		H <sub>MIN</sub>	J <sub>MIN</sub>	<b>ØA</b> -0,2
10	62,20	52,85	5-7	7-9	-	54,70	48,45	27,50
20	65,90	59,70	6-8	9-11	12-14	58,40	55,20	36,50
30	87,70	80,50	10-12	13-16	17-20	81,20	74,00	51,50
40	85,90	78,70	14-18	19-23	24-30	76,40	71,20	64,50

<sup>\*</sup>G: flanges equipped with different clamping pads delivered with the backshell.



# Right angle plug





Socket

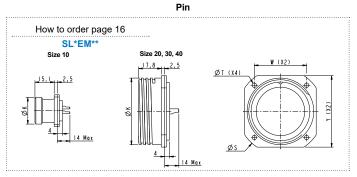
Size	D <sub>MIN</sub>	E <sub>MIN</sub>		ØG*		F <sub>MIN</sub>	R <sub>MIN</sub>	<b>ØA</b> -0,2
10	48,10	45,50	5-7	7-9	-	38,55	4,30	27,50
20	54,90	51,50	6-8	9-11	12-14	48,70	4,30	36,50
30	67,90	55,50	10-12	13-16	17-20	60,70	6,30	51,50
40	76,00	62,50	14-18	19-23	24-30	68,70	7,30	64,50

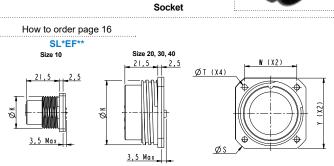
\*G: flanges equipped with different clamping pads delivered with the backshell.

# **SL61 & "SOCA"**

# Receptacle



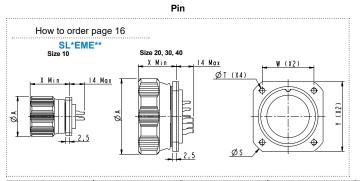


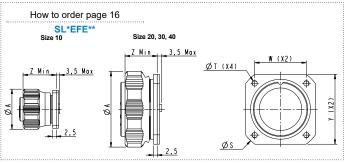


Size	ØK <sub>MIN</sub>	W	Υ	ØT	ØS
10	21,00	19,00	25,00	3,20	33,00
20	28,10	24,00	31,00	3,50	40,00
30	42,20	34,00	46,00	3,50	57,00
40	52,20	41,00	56,00	3,50	67,00

# Receptacle with locking ring





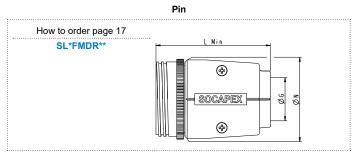


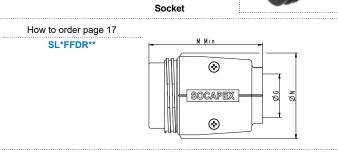
Socket

Size	ØA	W	Y	ØT	øs	X <sub>Min</sub>	Z <sub>MIN</sub>
10	27,50	19,00	25,00	3,20	33,00	25,90	21,20
20	36,50	24,00	31,00	3,50	40,00	24,20	20,20
30	51,50	34,00	46,00	3,50	57,00	24,40	20,20
40	64,50	41,00	56,00	3,50	67,00	29,15	22,43

# Inline receptacle







Size	L <sub>MIN</sub>	M <sub>MIN</sub>	ØN <sub>MIN</sub>		ØG*	
10	53,50	57,75	25,00	5-7	7-9	-
20	61,15	59,70	33,00	6-8	9-11	12-14
30	81,95	80,50	46,00	10-12	13-16	17-20
40	80,15	79,50	55,00	14-18	19-23	24-30

<sup>\*</sup>G: flanges equipped with different clamping pads delivered with the backshell. All the dimensions are in mm except as otherwise specified

#### **SL61 & "SOCA" - ACCESSORIES**





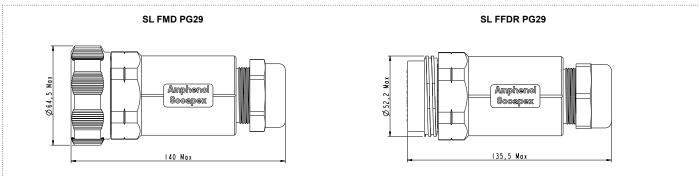
	Straight b	packshell	Right angle	e backshell
Size	Non conductive	Conductive	Non conductive	Conductive
	Black √	Nickel √	Black √	Nickel <
10	47377N	47377NI	47381N	47381NI
20	47378N	47378NI	47382N	47382NI
30	47379N	47379NI	47383N	47383NI
40	47380N	47380NI	47384N	47384NI

# 419AR monopiece backshell

- IP67, compatible with 419AR receptacle
- Exclusive gland design
  - to ensure a high mechanical retention of the cable
  - available in size 29 or 36 according to the outside diameter of the cable
- Exclusive thread design
- to avoid accidental unscrewing of the backshell while mating / unmating
- Built-in double insulation and black non conductive plating for safety
- Contacts size 12 (AWG14-12, conductor diameter up to 2,45 mm)
- Socapex split backshell (47380N) can be used with the new plug



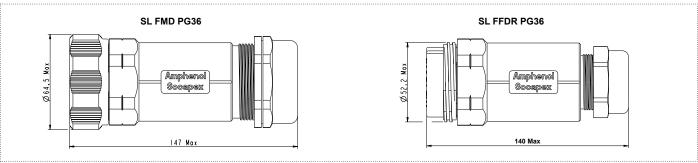
#### PG size 29



	Size 29 (cable diameter 15mm to 24mm)			
	Connector	Backshell	Set connector + backshell	
Male plug	SLD BMPG 419AR	47029N		SLD FMD PG29 419AR
Female inline receptacle	SLD BFRPG 419AR		SLD FFDR PG29 419AR	
Female grounded inline receptacle	SLGD BFRPG 419AR		SLGD FFDR PG29 419AR	



#### PG size 36



	Size 36 (cable diameter 24mm to 34mm)				
	Connector	Backshell	Set connector + backshell		
Male plug	SLD BMPG 419AR		SLD FMD PG36 419AR		
Female inline receptacle	SLD BFRPG 419AR	47036N	SLD FFDR PG36 419AR		
Female grounded inline receptacle			SLGD FFDR PG36 419AR		

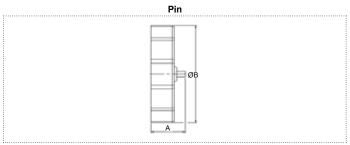
 <sup>✓:</sup> RoHS compliant
 Straight or right-angle backshells are delivered with different clamping pads

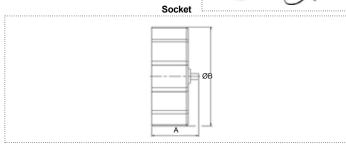
# **SL61 & "SOCA" - ACCESSORIES**

All the protection caps are RoHS compliant (plastic material).

# Protection cap for receptacle and inline receptacle





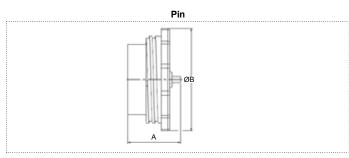


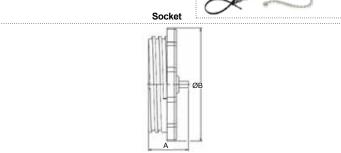
Receptacle	Inline receptacle	Size	A <sub>MAX</sub>	ØB <sub>MAX</sub>
SLBEM1B	SLBFMR1B	10	18,40	27,10
SLBEM2B	SLBFMR2B	20	20,20	38,00
SLBEM3B	SLBFMR3B	30	20,20	52,00
SLBEM4B	SLBFMR4B	40	20,20	63,00

Receptacle	Inline receptacle	Size	A <sub>MAX</sub>	ØB <sub>MAX</sub>
SLBEF1B	-	10	26,90	27,10
SLBEF2B	SLBFFR2B	20	29,20	38,00
SLBEF3B	SLBFFR3B	30	29,20	52,00
SLBEF4B	SLBFFR4B	40	29,20	63,00

# Protection cap for plug and locking ring receptacle







Plug	Locking ring receptacle	Size	A <sub>MAX</sub>	ØB <sub>MAX</sub>
SLBFM1B	-	10	30,90	21,10
SLBFM2B	-	20	31,70	38,00
SLBFM3B	BFM3B	30	31,70	52,00
SLBFM4B	BFM4B	40	31,70	63,00

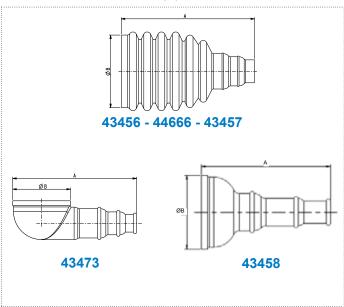
Plug	Locking ring receptacle	Size	A <sub>MAX</sub>	ØB <sub>MAX</sub>
SLBFF1B	-	10	18,90	27,10
SLBFF2B	-	20	21,20	38,00
SLBFF3B	BFF3B	30	21,20	52,00
SLBFF4B	BFF4B	40	21,70	63,00

# SL61 & "SOCA" - ACCESSORIES

# **Sealing sleeve**

Spray proofing sleeves, made of neoprene, are mounted on the rear of the plug body.

#### SL61

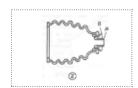


43473		L	43458		
Connector	Size	A <sub>MAX</sub>	ØB <sub>MAX</sub>	Designation	
Straight	10	32,00	18,20	43458	
Right angle	10	39,00	18,20	43473	
Straight or right angle	20	56,00	26,00	43456	

86,00

Sealing sleeve assembly instructions				
Straight	Right angled			

If necessary, adjust the end of the sleeve to the diameter of the cable in use. Size 10 connectors: cut off part A for cables using the large diameter cable clamp. Size 20-30-40: cut off part A for cables using the middle sized clamp, and parts A and B for cables using the largest diameter cable clamp. The sleeve must not be gripped by the cable clamp. For small diameter cables, parts A and B should be folded back, as shown:



# Grounding discs for 419 AR arrangement

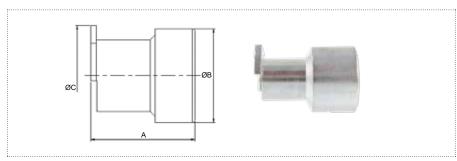
Pin insert: <b>140654-91</b> (front mounting)	Socket insert: <b>140653-00</b> (rear mounting)
***	
Not available for SLG 419AR series	

# Adaptator for flexible conduit and PG thread

37,90

47,30

43457



Connector size	PG size	A <sub>MAX</sub>	ØB <sub>MAX</sub>	ØC <sub>MAX</sub>	Designation
20	9	33,50	22,20	24,00	SL RF 2 09N
20	11	33,50	22,20	24,00	SL RF 2 11N
	13	38,70	30,70	32,00	SL RF 3 13N
30	16	38,70	30,70	32,00	SL RF 3 16N
	21	38,70	39,50	32,00	SL RF 3 21N
	16	44,00	39,50	42,00	SL RF 4 16N
40	21	44,00	39,50	42,00	SL RF 4 21N
Ī	29	43,00	39,70	39,70	SL RF 4 29N



# SL61 - HOW TO ORDER

# **Connector (without backshell)**

1.	2.	3.	4.	5.
SL	D	EM	37Y	

Shall	plating		
Jileli	piatilig	 	
D	Black coating <		
Blank	Nickel <	 	
DIAIIK	Clear cadmium		

EM

FMF

BMR

вм

5. Shell p	plating
NI	Nickel
Blank	Black coating ✓ Clear cadmium

See part "Insert arrangement" page 8-10

4. Insert arrangement

Receptacle

Locking ring receptacle

Inline receptacle

#### "SOCA" SLG 419AR - SHOWBIZ - HOW TO ORDER

EF

**EFE** 

BFR \*

BF

# **Grounding version**

1.	2.	3.	4.
SLG	D	EF	419AR

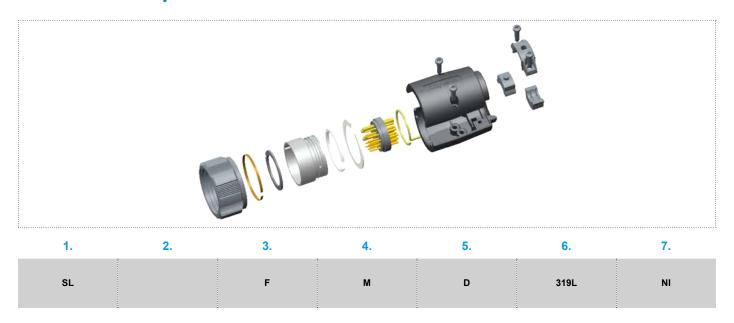


FEDR Socket inline recentacle	Socket inline receptacle
: Oboket illille receptacie	
i i i i i i i i i i i i i i i i i i i	

<sup>\*</sup> not available for 13U, 14V & 17P

#### **SL61** - HOW TO ORDER

# Connector + 2-parts backshell



1. Connector type		
	CI.	

2. Shell plating					
D	Black coating				
Blank	Nickel ✓ Clear cadmium**				

# 3. Kit, mandatory digit

_	4. Contact gender				
M	Pin				
F	Socket				

not available in female version for 13U, 14V and 17P arrangement delivered with black backshell

5. Kit composition						
D	Plug + straight backshell					
DR	Inline receptacle + straight backshell *					

Plug + right angle backshell

# 6. Insert arrangement

See part "insert arrangement" page 8-10

7. Shell pla	7. Shell plating					
NI	Nickel ✓					
Blank	Black coating ✓ Clear cadmium**					

#### Kit details



#### A kit is made of :

- SL connector
- 2-parts backshell (upper backshell & lower backshell) + 2 fixing screws
- 2 or 3 plastic cable clamps (2 for size 10, 3 for sizes 20, 30, 40)
- 1 cable fixing bridge + 2 bridge fixing screws

<sup>:</sup> RoHS compliant

# SL61 & "SOCA" - WEIGHTS

In grams		Plo body + b	ug: backshell		Pli bo	ug: ody	Rece	ptacle		ceptacle : packshell	Inline re		Lockir recep	ng ring otacle
Insert	SL F FD	SL F MD	SL F FC	SLFMC	SL B F	SLBM	SLEF	SLEM	SL FF DR	SL FM DR	SL BF R	SL BM R	SL E FE	SL E ME
13U	30	33	42	45	15	23	15	12	-	28	12	12	22	22
14V	30	34	42	46	16	24	15	12	-	29	12	12	22	22
17P	32	35	44	47	18	25	17	13	31	30	14	13	24	23
23C	62	65	80	83	35	41	26	24	57	58	24	15	37	36
25D	32	35	80	83	35	41	26	24	57	58	24	15	37	36
212AF	62	65	80	83	36	42	27	24	57	58	24	16	38	36
222P	67	68	85	86	41	46	32	27	62	61	29	20	43	39
34H	136	145	165	174	74	87	67	63	122	125	56	41	81	78
37Y	135	142	164	171	72	82	65	58	121	122	54	36	79	73
319L	133	135	162	164	69	77	64	53	119	115	52	31	78	68
337P	143	143	172	172	78	84	74	60	129	123	61	38	88	75
419AR	209	212	238	241	113	133	101	85	191	194	92	87	124	116
439R	202	203	231	232	106	123	96	77	183	185	85	78	119	108
G419AR		<del>.</del>					99	<del>.</del>	186		88	•		

In grams	Protection cap						
Size	SLB FF B FF *	SLB FM B FM *	SLB EF SLB FFR	SLB EM SLB FMR			
10	11	12	14	11			
20	14	18	22	15			
30	19	27	31	21			
40	23	34	39	26			

<sup>\*</sup> B FF & B FM caps in size 10 & 20 are not available

#### **ABOUT AMPHENOL**

Founded in 1932, **Amphenol** is one of the largest manufacturers of interconnect products in the world. The company designs, manufactures, and markets electrical, electronic, and fiber optic connectors, interconnect systems, and coaxial and specialty cables.

**Amphenol** has a diversified presence as a leader in high growth areas of the interconnect industry and provides solutions for customers in the automotive, broadband, industrial, information technology and data communications, military and aerospace, mobile devices, and mobile networks markets.

More info on www.amphenol.com



**Amphenol Military & Aerospace Operations** (AMAO) has the largest and broadest selection of interconnect products in the military and aerospace markets.

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