

# Amphenol

Amphenol-Tuchel Electronics GmbH

## Connectors

Series C 148 U



# Worldwide Performar

## The Company

Amphenol-Tuchel Electronics GmbH is a global company and a leading manufacturer of electrical connector solutions.

The superior quality of our product line is a result of state of the art engineering and technology in conjunction with leading edge production methods.

Our worldwide production and sales channels provide local competence in a global marketplace.

Amphenol has set standards in electrical connector technology with many inventions and patents. These solutions are appreciated features in product applications such as industrial machine tool, automotive, telecom as well as datacom markets.



## System description

The connectors of the Amphenol product series C 148 U are characterised by a robust and compact design, simple handling, and high mechanical and electrical strength. These connectors, designed for use in control systems and servo-drives, thus meet all requirements demanded of a decentralised plug-connector system for use under rough operating conditions. They are suitable for wire sizes of 0.5 mm<sup>2</sup> to 10 mm<sup>2</sup> and cover about 95% of all possible applications.

The modular usability of the individual components reduces the amount of stock which has to be kept. A further advantage is the simple, quick and reliable assembly of connectors for equipment and cables. No special tools are needed for inserting the contacts into the insulated body.

The proven crimp technology is very suitable for connecting wires to contacts for systems subject to vibration stresses. All of the connectors are designed for use in electromagnetic interference fields. The EMI protection is ensured by the metallic construction and the full connection of the cable shield within the connectors.

The application sector for the C 148 U series extends from mechanical engineering to drive solutions and decentralised control systems with power buses.



## Main features

- Right angled and straight connectors
- Robust metal construction
- Meets IP 65 and IP 67 specifications
- Locking levers coupling
- Number of contacts 3 + PE (power contacts)  
+ 3 (signal contacts)
- 630 V rated voltage
- 60 A rated current at  $T_v$  40°C
- Cable strain relief with cable clamp
- Cable dia. 8 - 23 mm
- EMI protected in mated and locked condition
- Crimp termination
- Excellent cost/value ratio
- Premating earth contact
- Cable and panel connector connected with premating earth contact

## C 148 U Technical Data

General Characteristics	Standard	Value
No. of contacts		3 + 3 + PE
Termination		crimp
Wire size power contacts		1.5 - 10 mm <sup>2</sup> ; 16 - 8 AWG
Wire size signal contacts		0.5 - 1.5 mm <sup>2</sup> ; 20 - 16 AWG
Coupling		Locking levers
Flammability	UL 94	V-0

### Electrical Characteristics

Rated voltage	IEC 60 664-1	630 V AC/DC (500 V AC/DC signal contacts)
Rated impulse voltage	IEC 60 664-1	6.0 KV
Material group	IEC 60 664-1	II
Contact resistance	IEC 60 512-2, Test 2 a	≤ 3 mΩ (≤ 5 mΩ signal contacts)
Insulation resistance	IEC 60 512-2, Test 3 a	≥ 10 <sup>8</sup> Ω
Current carrying capacity (power contacts)	IEC 60 512-3, Test 5 b	approx. 60 A (see derating curves)
Current carrying capacity (signal contacts)	IEC 60 512-3, Test 5 b	5 A

### Climatic Conditions

Climatic Conditions	Standard	Contact Inserts	Housing
Climatic category	IEC 60 068-1	25 / 125 / 21	25 / 100 / 21
Lower temperature limit	IEC 60 512-6, Test 11 j	-25 °C / 16 h	-25 °C / 16 h
Upper temperature limit	IEC 60 512-6, Test 11 i	+125 °C / 1000 h	+100 °C / 1000 h

### Mechanical Characteristics

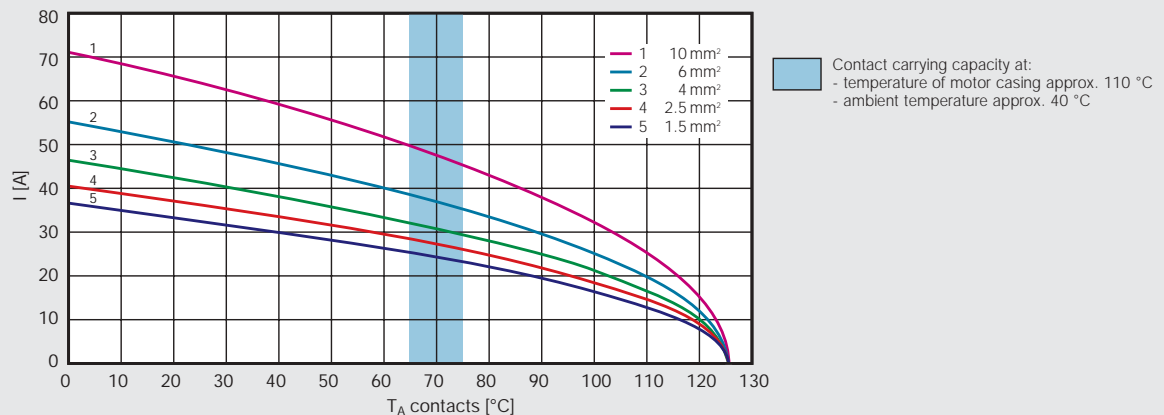
Insertion and withdrawn forces	IEC 60 512-7, Test 13 b	≤ 30 N
Mechanical life cycle	IEC 60 512-5, Test 9 a	≥ 100 mating cycles
Locking force	IEC 60 512-7, Test 13 a	≤ 150 N
Protection class	IEC 60 529	IP 65 / IP 67

### Materials

Contact insert	PA 6.6
Contacts	Cu-alloy
Contact plating	Ag
Housing	Zn die cast
Housing plating	Ni

Technical data refer to connectors in mated and locked condition.

## C 148 U Derating curves power contacts



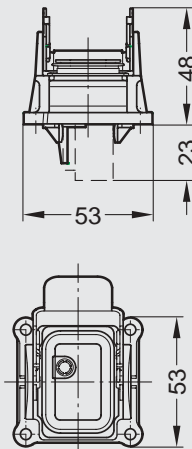
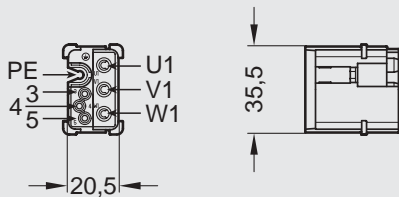
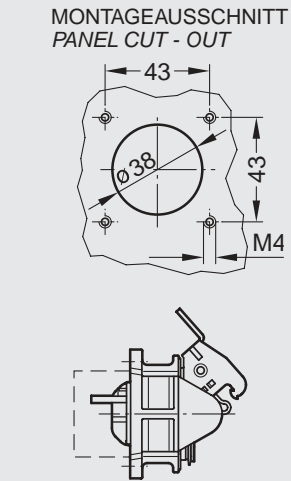
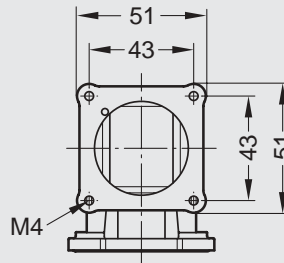
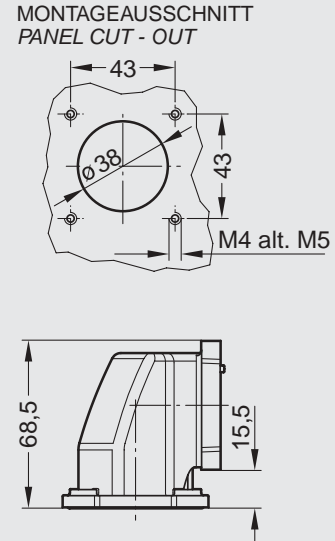
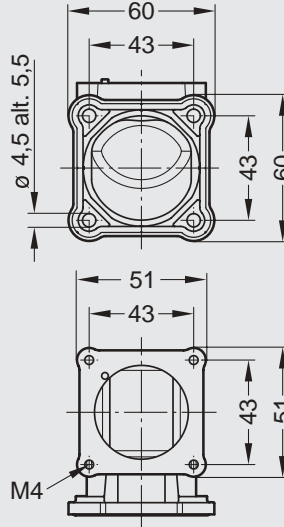
# C 148 U Panel Connectors



**Panel connectors for male contact inserts**, for wire sizes 0.5 - 10 mm<sup>2</sup>, 20 - 8 AWG. The straight panel connector housing can also be used without the angled housing. For contacts see page 7.

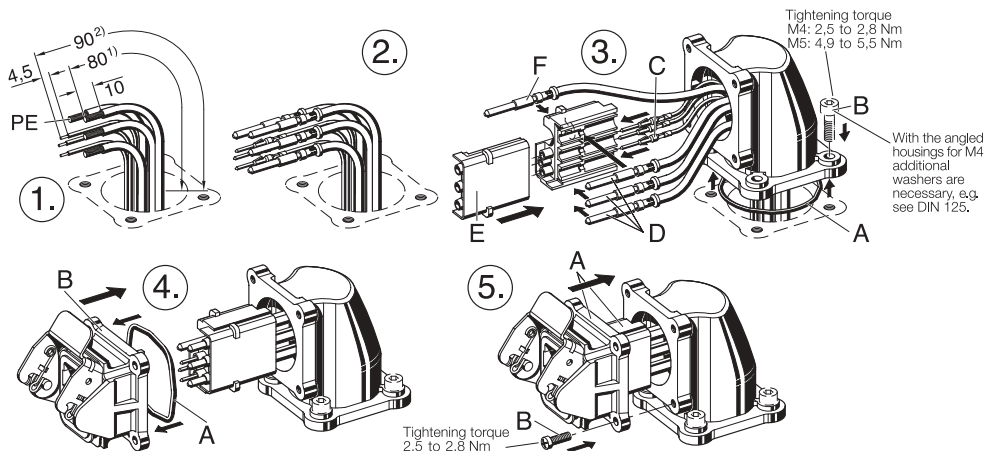
Description	Part No.
Angled housing M5	C148 G20 000 G1
Straight housing	C148 10F001 000 1
Male contact insert	C148 10A006 000 1
Angled housing M4	upon request

Each packaging contains 25 pieces.



## Assembly Instruction

Refer also page 8,  
Assembly + Termination



1) Power wire; PE = 83mm  
2) Signal wire

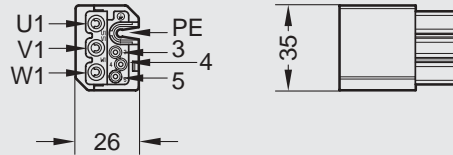
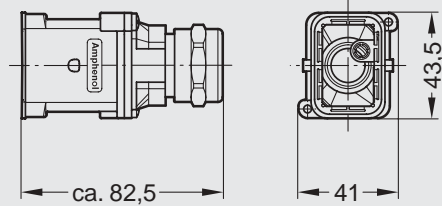
## C 148 U Cable Connectors



**Cable connectors for female contact inserts,**  
for cable diameter  
8 - 23 mm and wire sizes  
0.5 - 10 mm<sup>2</sup>, 20 - 8 AWG.  
For contacts see page 7.

Description	∅ Cable	Part No.
Female cable connector	8 - 14 mm	C148 10G006 200 1
Female cable connector	14 - 17 mm	C148 10G006 201 1
Female cable connector	17 - 20 mm	C148 10G006 202 1
Female cable connector	20 - 23 mm	C148 10G006 203 1
Female contact insert		C148 10B006 000 1

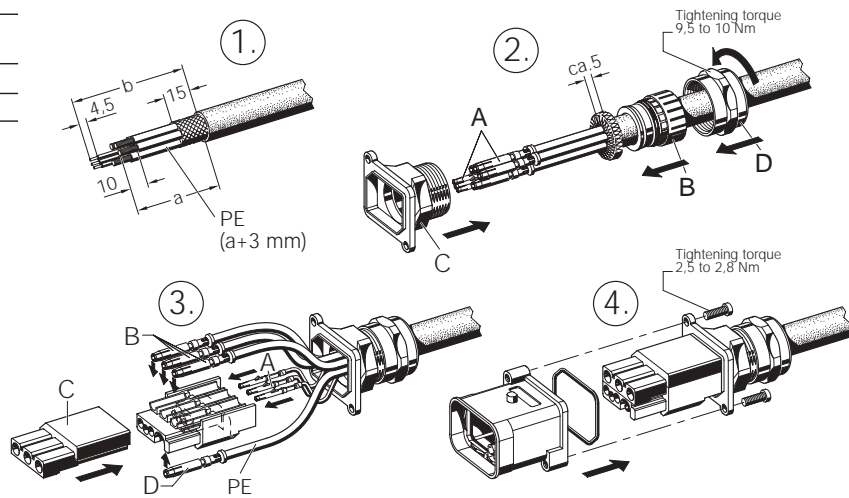
Each packaging contains 25 pieces.



### Assembly Instruction

Refer also page 8,  
Assembly + Termination

∅ Cable	a Power wire	b Signal wire
8 - 17 mm	43 mm	54 mm
17 - 23 mm	52 mm	63 mm



## C 148 U Turned Crimp Contacts

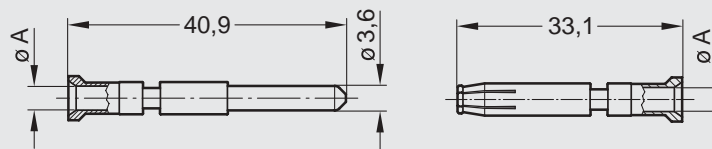


Turned crimp contacts  
for  $\varnothing 3.6$  mm

Description	Wire size in mm <sup>2</sup>	AWG	A in mm	Quantity	Part No.
Male contact	1.5	16	1.75	100	VN 01 036 0008 (1)
	2.5	14	2.25	100	VN 01 036 0009 (1)
	4	12	2.85	100	VN 01 036 0010 (1)
	6	10	3.5	100	VN 01 036 0011 (1)
	10	8	4.4	100	VN 01 036 0014 (1)
Female contact	1.5	16	1.75	100	VN 02 036 0007 (1)
	2.5	14	2.25	100	VN 02 036 0008 (1)
	4	12	2.85	100	VN 02 036 0009 (1)
	6	10	3.5	100	VN 02 036 0010 (1)
	10	8	4.4	100	VN 02 036 0013 (1)

### Crimping tools

4-ident hand crimping tool	TB 0002
Contact locator	TB 0000 146 0007
Calibration pin set	TP 0000 146 1200

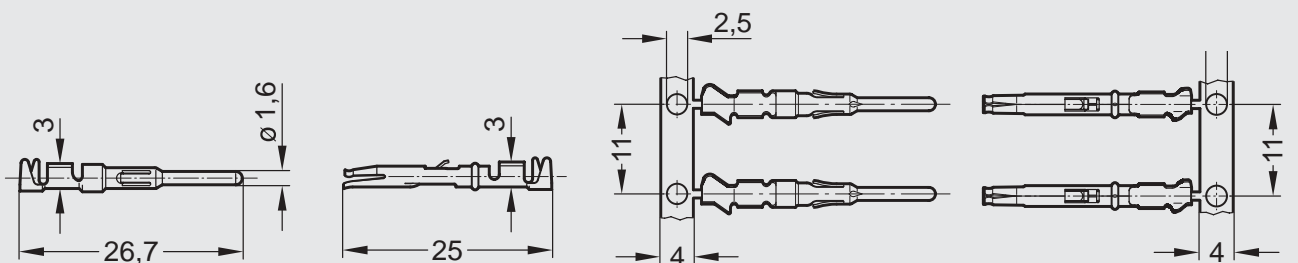


## C 148 U Stamped Crimp Contacts



Stamped crimp  
contacts  
for  $\varnothing 1.6$  mm

Description	Wire size in mm <sup>2</sup>	Supplied as	Quantity	Part No. Contacts	Crimping tool	Part No. Crimping tools
Male contact	0.5 - 1.5 20 - 16 AWG	single contact	100	VN 01 016 0002 (1)	Hand crimping tool	TA 0000
		single contact	200	ZN 01 016 0002 (1)	Crimping dies	TA 0000 163
		single contact	200	ZN 01 016 0002 (1)	Contact locator	TA 0002 146 0001
		contacts on reel	2000	HN 01 016 0002 (1)	Hand crimping tool	FA 0000 110
Female contact	0.5 - 1.5 20 - 16 AWG	single contact	100	VN 02 016 0002 (1)	Crimping dies	FA 0000 163
		single contact	200	ZN 02 016 0002 (1)	Contact locator	TA 0002 146 0001
		single contact	200	ZN 02 016 0002 (1)	Hand crimping tool	FA 0000 110
		contacts on reel	2000	HN 02 016 0002 (1)	Crimping dies	FA 0000 163
					Semi automated crimping tool upon request	
					Hand crimping tool	TA 0000
					Crimping dies	TA 0000 163
					Contact locator	TA 0002 146 0001
					Hand crimping tool	FA 0000 110
					Crimping dies	FA 0000 163
					Semi automated crimping tool upon request	
Removal tool for all stamped crimp contacts						FG 0300 146 1



## 1. General Remarks

The connectors of the C 148 U series are designed to meet the high demands of industrial applications under harsh environmental conditions. The connectors are designed and built in accordance with DIN VDE 0627. We reserve the right to change the design due to improvements in quality, product developments, or production requirements.

All technical details refer to connectors, which according to the regulated uses should not be mated or separated when electrical voltage is applied. The data and instructions as listed are to help the user select the correct product and to ascertain correct and matched applications.

## 2. Application

Connectors must only be used according to the specified calculated dimensions. Please note that calculated quantities are frequently only shown as initial values which have been determined under special test conditions and are subject to change especially under longer terms or different forces. The connectors of the C 148 U series are designed for applications in the equipment and machine tool industry as well as for instrumentation. Selection and testing of connectors and/or plug and panel devices are designed to meet specific product or industrial requirements, such as calculated voltage and the related clearances and creepage distances.

It is the responsibility of the user to check whether the connection differs to the specified requirements and therefore to judge whether the application is suitable.

All calculated data for the connectors listed in this catalog are based on overload category III and contamination level 3 (for machine tool applications). In the applications be sure the connectors are completely mated according to their respective safety locking mechanism. All technical data refer to mated connectors under locked conditions.

## 3. Assembly

Certain appliances and equipment include protective measures that relate to the coupling devices of the male and female receptacle housings.

Care must be taken to ensure the parts are correctly mated and screws are tightened with the proper torque.

In order to stop the loosening of the screw, we recommend the use of washers or screws which are supplied with a suitable secure glue.

In regards to the screwing together of angled housings and straight housings, we recommend our screws N 03 040 0022 (1), and to the screwing on of the angled housings screws with a suitable surface coating can be used, e.g. see DIN 912 or DIN 7985 (strength level 8.8).

## 4. Termination

Cable connectors are effectively secured when using the internal cable clamp. When the connector contains a simple gland bushing for retention, the cable should have a strain relief close behind the connector. All cable properties or specifications must be compatible with the connector design and materials. Designated wire conductors must be soldered to the correct positions. Crimped contacts must be terminated with the specified tools of the manufacturer.

Contacts must be fully inserted into the plastic housing and retention assured with a slight tug on the wire. Wire should be stripped correctly according to printed specifications to insure no electrical contact can be made between the conductors. There should be no cut strands during the stripping action.

## 7. EMI

The specified requirements according to the EMI-Law (EMI-Directive 89/336EWG) must be ensured by corresponding installation in the equipment.



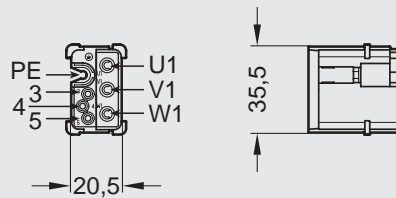
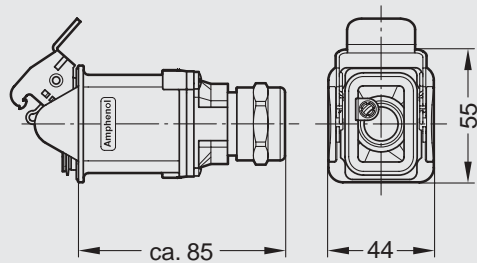
## C 148 U Cable Connectors



**Cable connectors for male contact inserts,**  
for cable diameters  
8 - 23 mm and wire sizes  
0.5 - 10 mm<sup>2</sup>, 20 - 8 AWG.  
For contacts see page 7.

Description	∅ Cable	Part No.
Male cable connector	8 - 14 mm	C148 10G006 400 1
Male cable connector	14 - 17 mm	C148 10G006 401 1
Male cable connector	17 - 20 mm	C148 10G006 402 1
Male cable connector	20 - 23 mm	C148 10G006 403 1
Male contact insert		C148 10A006 000 1

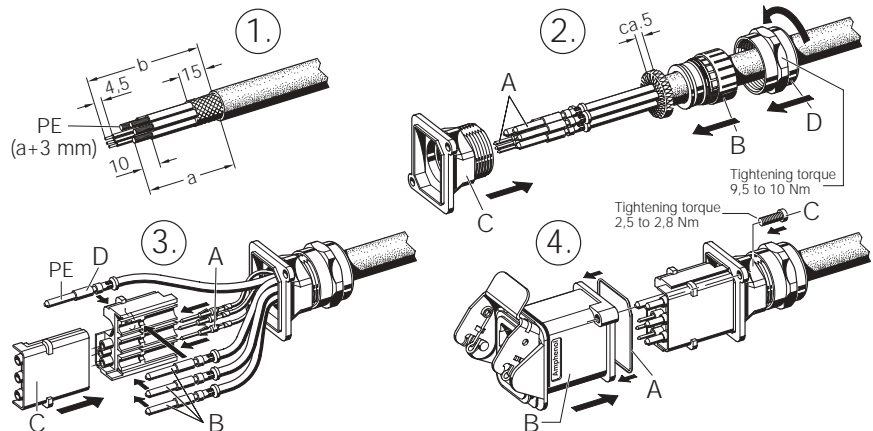
Each packaging contains 25 pieces.



### Assembly Instruction

Refer also page 8,  
Assembly + Termination

∅ Cable	a	b
	Power wire	Signal wire
8 - 17 mm	41 mm	52 mm
17 - 23 mm	50 mm	61 mm



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