Fischer UltiMate™
Original Series

Technical Specifications

Connect²

Expertise | Reliability | Innovation

Edition 2.0

fischer® CONNECTORS

Rugged, Compact, Lightweight Connectors for Harsh Environments

Fischer Connectors is a leading company in the design, manufacturing and distribution of high-performance connectors and cable assembly solutions. Known for their quality, ruggedness and excellent sealing, our products prove to be reliable in the most demanding environments.

Innovative and flexible, Fischer Connectors is committed to provide customized solutions of uncompromising quality. Primary design and manufacturing facilities are located in Switzerland, with subsidiaries and distributors located worldwide.

Connect² Expertise

We connect not only with customers who build devices, but with the people who use them on a daily basis, to better understand their needs.

- Engineering Expertise
- Supply Chain Expertise
- Market Expertise

Connect² Reliability

We focus on delivering on time, on cost and on experience connectivity solutions that stand up to the toughest conditions, so you know you can rely on our service and on uncompromising quality in all environments.

- Quality Reliability
- Delivery Reliability
- Response Reliability

Connect² Innovation

Our proven track record in first-to-market, innovative solutions is built on imagination, observation and significant investments in R&D. We help you bring new ideas to market quickly by putting our cutting-edge technology, production tools and experts at your service.

- Technology Innovation
- Product Innovation
- Solutions Innovation

ISO 9001 ISO 13485 ISO 14001 RoHS compliant REACH

Technical Specifications

Introduction to Fischer UltiMate™ Original Series

Product Features

- *High shock and vibration resistance*
- *Operating temperatures: -55°C to +135°C*
- *10,000 mating cycles*
- *Wide range of configurations*
- *Military standards compliant*
- *1'000 hours saltspray resistance*

1. Sealing IP68/69K even unmated

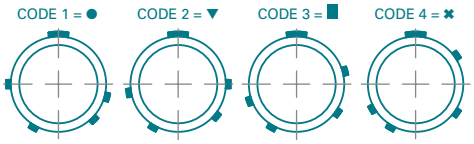
- One piece body
- Cable assembly containing epoxy

2. EMC 360° high performance shielding

- Grounding contact ring
- Cable assembly design

3. Mechanical and visual coding

- Robust mechanical coding
- 4 options with visual coding



4. Soft sealing caps

- Rugged, IP68 sealing
- Easily installed on plug and receptacle

Cable Assembly Solutions

Fischer Connectors develops innovative complete cable assembly solutions for Fischer UltiMate™ Original Series. Rely on our engineering expertise for your harsh environment applications and order a complete turnkey solution from only one source.

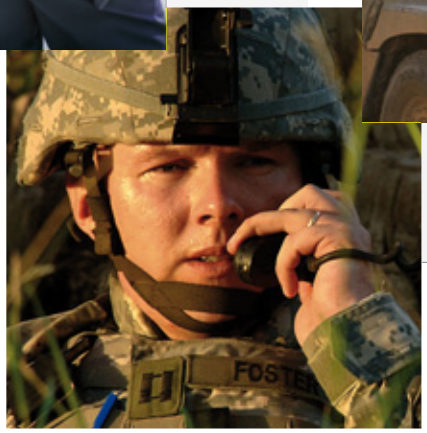
- Durable and reliable overmolding specially designed for severe conditions
- High performance epoxy potting for IP68/69K sealed connectors
- Cable assembly designed for excellent EMC 360°shielding
- Straight and right angle thermoplastic overmolding
- Easy prototyping with Do-It-Yourself cable termination kit

Please contact us for more details on Fischer cable assembly solutions

Introduction to the Fischer UltiMate™ Original Series

Applications

The Fischer UltiMate™ Original Series is specially designed for a broad range of harsh environment applications. It offers rugged, compact, lightweight, sealed connectors and cable assembly solutions ideally suited to withstand a variety of severe environmental, industrial and chemical conditions.



MIL APPROVED

MEDICAL APPROVED

Technical Specifications

Product Range Overview

Plugs

Cable mounted

- UP01: Short cable plug

Panel mounted

- UP50: Front mounted panel plug

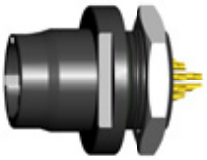
Receptacles

Panel mounted

- UR01: Rear mounted low profile receptacle

- UR02: Rear mounted receptacle

- UR03: Front mounted low profile receptacle



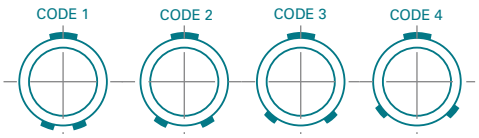
Cable mounted

- UR50: Short cable receptacle

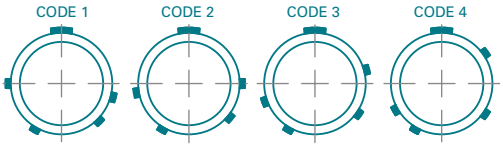
Mechanical Coding

Plugs

- Size 08

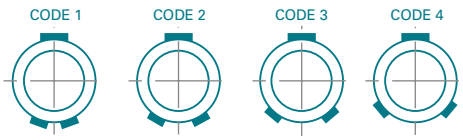


- Size 11, 13 and 18

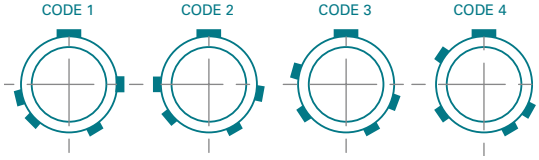


Receptacles

- Size 08



- Size 11, 13 and 18



Technical Specifications

Part Numbering

Structure

Connector Design				Contact Block		
Parts						
Body Style	Sealing Level	Locking System	Connector Size	Polarity	Number of Contacts	Contact Type
Available Choices						
UltiMate Plug = UP **Cable Mounted Plug** ▪ Short = **UP01** **Panel Mounted Plug** ▪ Front mounted = **UP50** **UltiMate Receptacle = UR** **Panel Mounted Receptacle** ▪ Rear mounted low profile = **UR01** ▪ Rear mounted = **UR02** ▪ Front mounted low profile = **UR03** **Cable Mounted Receptacle** ▪ Short = **UR50**	**Panel Mounted** ▪ Vacuum sealing = **V*** ▪ Water sealing = **W** **Cable Mounted** *** Not applicable** **IP68/69K with Fischer Connectors Cable Assembly Solution**	**Cable Mounted Plug** ▪ Push-pull automatic locking system = **L** ▪ Quick release = **Q** **Cable Mounted Receptacle = Z** **Panel Mounted** **Not applicable**	▪ Size 8 = **08** ▪ Size 11 = **11** ▪ Size 13 = **13** ▪ Size 18 = **18** **Size corresponds to Interface Diameter of Plug and Receptacle in mm**	▪ Male contacts = **M** ▪ Female contacts = **F** **Standard Polarity** **Male Contacts on Plug** **Female Contacts on Receptacle** **Inverted Polarity** **Female Contacts on Plug** **Male Contacts on Receptacle**	**002 to 042** Contacts available per size: ▪ **Size 08** 002, 003, 004, 005, 007, 009 ▪ **Size 11** 012, 016, 019 ▪ **Size 13** 027 ▪ **Size 18** 042	▪ Solder = **S** ▪ PCB = **P** ▪ Crimp = **C**

Examples

Cable Mounted Plugs *(UP01 to UP49)*

UP0X		L	11	M	012	S

Cable Mounted Receptacles *(UR50 to UR89)*

UR5X		Z	11	F	012	S

Panel Mounted Plugs *(UP50 to UP99)*

UP5X	W		11	M	012	S

Panel Mounted Receptacles *(UR01 to UR49)*

UR0X	W		11	F	012	S

Part Numbering

Structure

Housing	Standard Options

Parts

Housing Color	Keying Code	O-Ring Material	Insulating Material	Grounding	Housing Material

Available Choices

Housing Color	Keying Code	O-Ring Material	Insulating Material	Grounding	Housing Material
▪ Black = **BK*** ▪ Grey = **GR**	▪ Code 1 (●) = **1** ▪ Code 2 (▼) = **2** ▪ Code 3 (■) = **3** ▪ Code 4 (✖) = **4**	**Receptacle** **O-ring at plug interface** ▪ EPDM = **E** **Plug** **Not applicable = Z**	▪PBT = **1**	**Panel Mounted** ▪ Grounding pin = **A** Available for UR01/UR02 ▪ None = **N** for UR03/UP50 **Cable Mounted** **Not applicable = Z**	▪ **A =** Aluminium ▪ **B =** Brass**

*** Standard Housing Color is black**

Standard guide mark
White for Black housing color
Red for Grey housing color

Standard keying code 1

Visual coding on plug and receptacle
● ▼ ■ ✖

**** Standard Housing Material is Brass**
Please contact us for other o-ring material or insulating material

Examples

Cable Mounted Plugs *(UP01 to UP49)*

BK	1	Z	1	Z	B

Cable Mounted Receptacles *(UR50 to UR89)*

BK	1	E	1	Z	B

Panel Mounted Plugs *(UP50 to UP99)*

BK	1	Z	1	N	B

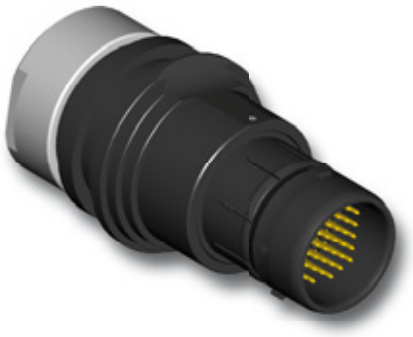
Panel Mounted Receptacles *(UR01 to UR49)*

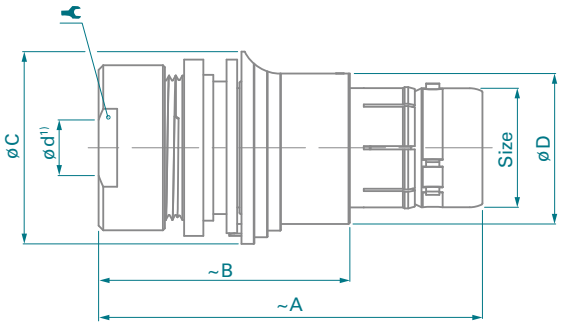
BK	1	E	1	A	B

Technical Specifications

Dimensions

UP01: Short Cable Plug

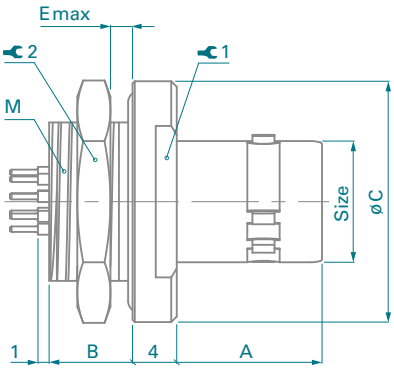


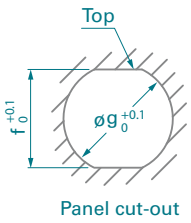


Size	A	B	øC	øD	ød max		Torque
08	39.0	25.0	15.0	10.5	4.5	10	1.5 Nm
11	39.5	26.0	18.5	13.7	7.1	12	3.0 Nm
13	50.0	34.0	21.7	16.0	8.7	17	3.5 Nm
18	58.0	38.0	29.0	22.7	13.7	22	6.0 Nm

[1)] Max. cable diameter below shield.

UP50: Front Mounted Panel Plug





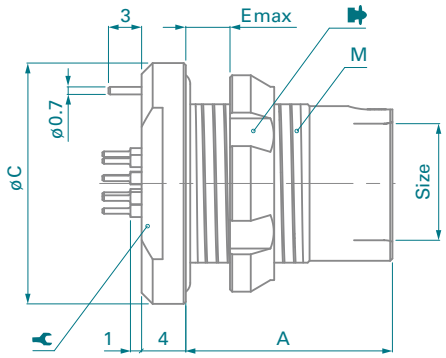
Size	A	B	øC	E	f	øg	M	1	2	Torque
11	13.15	7.55	21.8	4.5	14.5	16.1	16x1	17	19	4.5 Nm

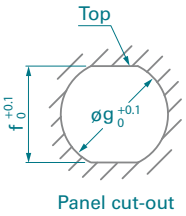
All dimensions shown are in millimeters and are for reference only.
They are subject to change without prior notice.

Technical Specifications

Dimensions

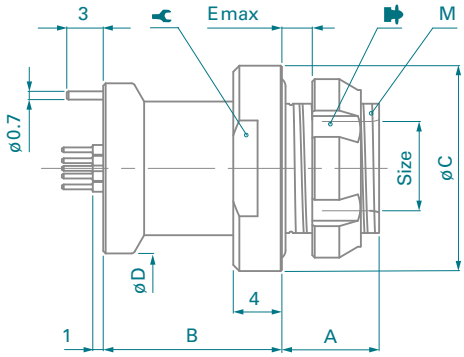
UR01: Rear Mounted Low Profile Panel Receptacle*

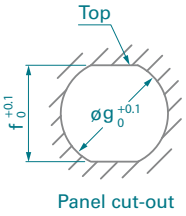




Size	A	øC	E	f	øg	M			Torque
08	18.7	16.9	5.0	10.9	12.1	12x1	15	TF00.001	2.5 Nm
11	18.7	21.8	7.0	14.5	16.1	16x1	17	TK00.002	4.5 Nm
13	22.5	23.8	5.5	16.5	18.1	18x1	20	TP00.011	6.0 Nm
18	29.3	31.8	7.5	23.2	25.1	25x1	27	TQ00.005	10.0 Nm

UR02: Rear Mounted Panel Receptacle*



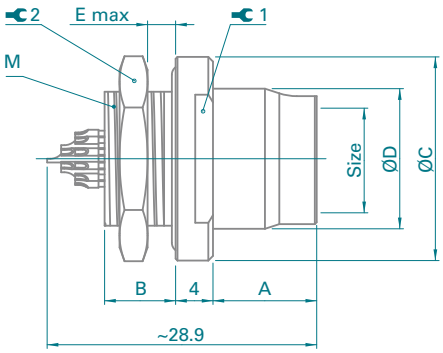


Size	A	B	øC	øD	E	f	øg	M			Torque
08	8.0	14.7	16.9	14.0	4.0	10.9	12.1	12x1	15	TF00.001	2.5 Nm
11	8.0	14.7	21.8	18.8	4.0	14.5	16.1	16x1	17	TK00.002	4.5 Nm
13	10.5	16.0	23.8	20.0	5.0	16.5	18.1	18x1	20	TP00.011	6.0 Nm
18	11.0	22.3	31.8	26.0	5.0	23.2	25.1	25x1	27	TQ00.005	10.0 Nm

*Standard version with PCB contacts and grounding pin.
For solder contact version, special solder ground contact pin is included.

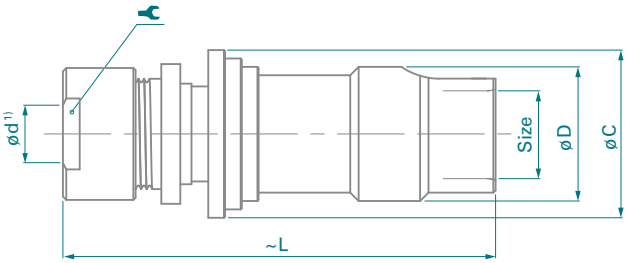
Dimensions

UR03: Front Mounted Low Profile Panel Receptacle*



Size	A	B	øC	øD	E	f	øg	M	1	2	Torque
08	11.7	7.0	16.9	11.5	4.0	10.9	12.1	12x1	15	14	2.5 Nm
11	11.1	7.6	21.8	15.0	4.6	14.5	16.1	16x1	17	19	4.5 Nm

UR50: Short Cable Receptacle



Size	L	øC	øD	ø dmax		Torque
08	39	15.0	12.0	4.5	10	1.5 Nm
11	39	18.5	15.5	7.1	12	3.0 Nm
13	50	21.7	17.9	8.7	17	3.5 Nm

1) Max. cable diameter below shield.

* Standard version with solder contacts

All dimensions shown are in millimeters and are for reference only.
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Technical Specifications

Contact Configurations

Size	Pin Layout	Number of Contacts	Contact Diameter [mm]	Wire Size [2]		PCB Contacts	Current Rating [A]	Rated Voltage r.m.s [V]	Test Voltage [kV] in mated position			
									IEC 60512-4-1 Test 4a			
							IEC 60512-5-2-5b	IEC 60664-1	AC r.m.s.		DC	
				Solder Contacts [1]	Crimp Contacts	Pin Diameter [mm]	(3)	(4)	Contact to Body	Contact to Contact	Contact to Body	Contact to Contact
08		2	0.9	max ø0.79mm AWG21 [1] AWG22 [7/30]	-	0.70	9.2	≤ 250	1.3	1.7	1.8	2.4
		3	0.9	max ø0.79mm AWG21 [1] AWG22 [7/30]	-	0.70	8.2	≤ 250	1.3	1.3	1.8	1.6
		4	0.7	max ø0.79mm AWG21 [1] AWG22 [7/30]	max ø0.62mm min ø0.38mm AWG24-28	0.50	5.5	≤ 200	1.2	1.2	1.7	1.8
		5	0.7	max ø0.79mm AWG21 [1] AWG22 [7/30]	max ø0.62mm min ø0.38mm AWG24-28	0.50	5.2	≤ 160	0.8	1.0	1.3	1.8
		7	0.5	max ø0.43mm AWG26 [1] AWG28 [19/40]	-	0.40	2.0	≤ 160	0.8	1.0	1.3	1.8
		9	0.5	max ø0.43mm AWG26 [1] AWG28 [19/40]	-	0.40	1.7	≤ 160	0.8	1.1	1.2	1.8
11		12	0.7	max ø0.79mm AWG21 [1] AWG22 [7/30]	max ø0.62mm min ø0.38mm AWG24-28	0.50	4.2	≤ 250	1.4	1.5	2.0	2.2
		16	0.5	max ø0.43mm AWG26 [1] AWG28 [19/40]	-	0.40	2.7	≤ 250	1.2	0.9	2.0	1.5
		19	0.5	max ø0.43mm AWG26 [1] AWG28 [19/40]	-	0.40	2.5	≤ 250	1.2	0.9	2.0	1.5
					[5]							
13		27	0.5	-	max ø0.43mm min ø0.20mm AWG28-32	0.40	2.0	≤ 200	1.2	0.5	1.8	0.5
18		42	0.7	-	max ø0.62mm min ø0.38mm AWG24-28	0.50	3.0	≤ 250	1.5	1.5	2.4	2.5

[1] Stranding values are in brackets.

[2] For a given AWG, the diameter of some stranded conductor designs could exceptionally be larger than the hole diameter of the barrel. Testing may be required.

[3] Recommended max. operating current per contact at 40°C temperature rise.

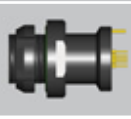
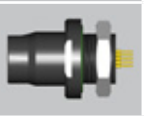
[4] Recommended operating voltage at sea level.

This rated voltage is a general purpose guideline where no other electrical safety standard applies. In cases other standards rule a specific use of the connector, then the application specific safety criteria shall be considered first.This must be evaluated in the frame of equipment engineering.

[5] Available on cable mounted plug & receptacle, standard polarity only. Please use General Crimping Instructions.

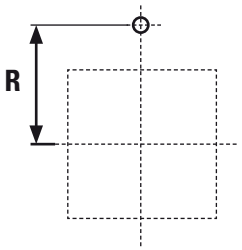
Layout and Pin Numbering

F →

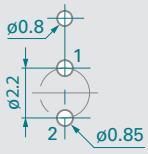
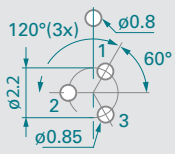
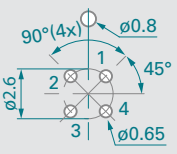
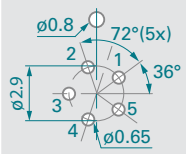
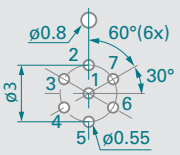
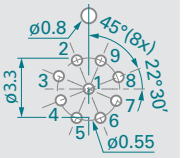
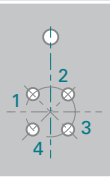
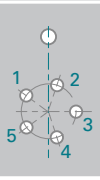
Body Styles	UP01	UP50		
				
	UR01	UR02	UR03	UR50
				

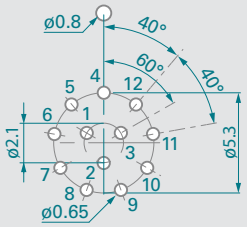
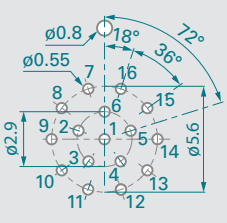
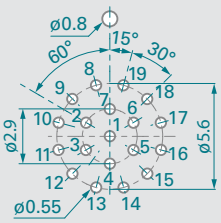
Position of ground pin

	R	
Size	UR01	UR02
08	6.0	
11	8.4	
13	9.0	
18	12.0	



Pin layout / PCB hole pattern[1] - View from F

Size	Polarity[2]	Number of Contacts					
		2	3	4	5	7	9
08	Standard						
	Inverted						

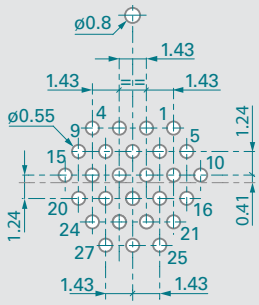
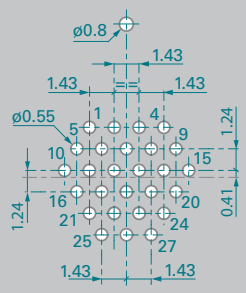
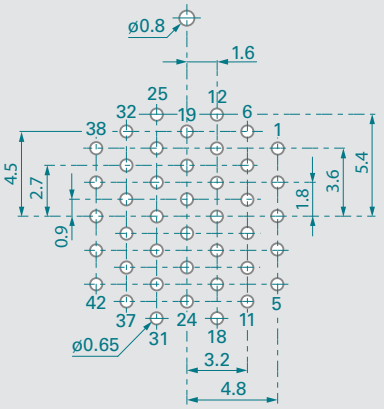
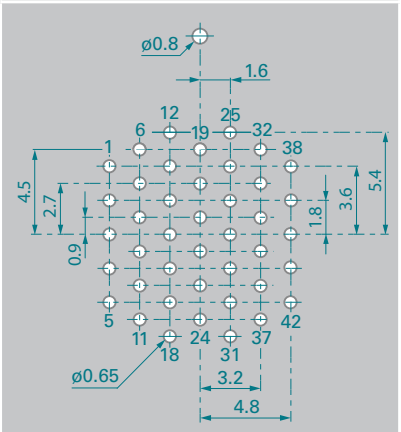
Size	Polarity[2]	Number of Contacts		
		12	16	19
11	Standard			
	Inverted			

[1] Recommended PCB hole dimensions may be adjusted to application.

[2] Standard polarity: Male contacts on Plug / Female contacts on Receptacle.
Inverted polarity: Female contacts on Plug / Male contacts on Receptacle.

Technical Specifications

Layout and Pin Numbering (cont.) - Pin layout / PCB hole Pattern [1] - View from F

Size	Polarity [2]	Number of Contacts: 27	Number of Contacts: 42
13	Standard		
	Inverted		
18	Standard		
	Inverted		

[1] Recommended PCB hole dimensions may be adjusted to application.

[2] Standard polarity: Male contacts on Plug / Female contacts on Receptacle.
Inverted polarity: Female contacts on Plug / Male contacts on Receptacle.

Online Technical Library:

Download our 3D CAD Models
www.fischerconnectors.com/technical

All dimensions shown are in millimeters and are for reference only.
They are subject to change without prior notice.

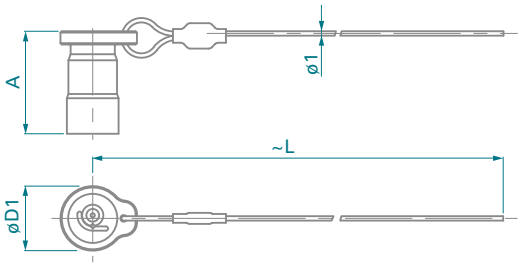
Technical Specifications

Soft Caps - Lanyard with Nylon Thin Cord

Cable Mounted Plugs

Crimp ferrule and heat shrink tube are included.

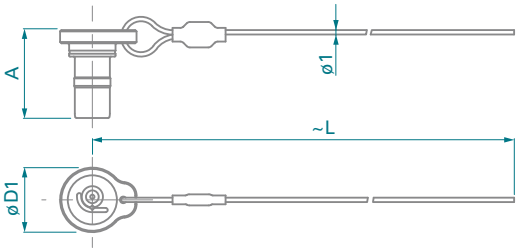
Size	A	øD1	L	Part Number
08	23.2	14.6	200	UCP08C 1A1 A200
11	22.0	17.6	200	UCP11C 1A1 A200
13	25.0	20.7	200	UCP13C 1A1 A200
18	29.5	28.7	200	UCP18C 1A1 A200



Cable Mounted Receptacles

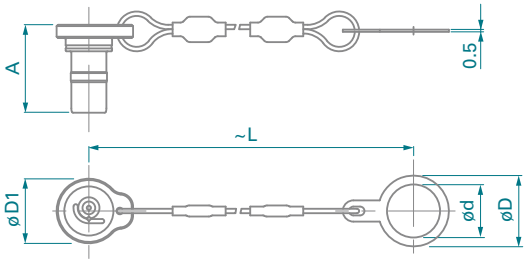
Crimp ferrule and heat shrink tube are included.

Size	A	øD1	L	Part Number
08	19.9	14.6	200	UCR08C 1A1 A200
11	19.2	17.6	200	UCR11C 1A1 A200
13	22.5	20.7	200	UCR13C 1A1 A200
18	25.0	28.7	200	UCR18C 1A1 A200



Panel Mounted Receptacles

Size	A	øD1	L	d	D	Part Number
08	19.9	14.6	95	12	16	UCR08P 1A1 A095
11	19.2	17.6	95	16	21	UCR11P 1A1 A095
13	22.5	20.7	95	18	23	UCR13P 1A1 A095
18	25.0	28.7	95	25	29	UCR18P 1A1 A095



Material
Cap: TPV (Santoprene™) (Flammability UL 94HB)
Cord: Nylon
Fixing lug: Black chrome plated brass (ISO CuZn37)
Crimp ferrule: Nickel plated copper

All dimensions shown are in millimeters and are for reference only.
They are subject to change without prior notice.

Technical Specifications

Technical Data

Environmental & Mechanical Data

Characteristic	Performance and Standard	
Sealing Performance Mated and Unmated	IP68: 2m submersion for 24 hours*; IEC 60529 «W» sealing level IP69K [1] Hermetic: Tested: <10^{-8} mbar l/sec. [2] ; IEC 60068-2-17 Test Qk, Method 3 «V» sealing level	
Operating Temperature Range	-55°C to +135°C [3] IEC 60512-6-11 i+j; IEC 60068-2-14-Nb	
Corrosion Resistance	Salt mist, 1000 hours [4], 5% salt solution, 35°C IEC 60068-2-11 Test Ka; MIL-STD-202 Method 101; EIA-364-26	
Endurance	10'000 mating cycles IEC 60512-5-9a; EIA-364-09	
Vibration, random	37.80 Grms, MIL-STD-202 Method 214A Condition I; EIA-364-28 Condition V	
Shock	300 g amplitude, half sine pulse of 3 ms, no discontinuity > 1 µs	MIL-STD-202 Method 213 EIA-364-27

[1] Dust tight, protected against the effects of the high-pressure liquids.
The test requirements for IP69K exist only in DIN 40050-9, the German version of IEC 60529.

[2] Only vacuum sealed receptacles (See Part Numbering page 6, "V" sealing level).

[3] Min. mating temperature of -20°C with EPDM interface O-ring. Other materials on request.
Temperature range of -40°C to +125°C for cable connectors overmolded with TPU material.

[4] Preserved mechanical and electrical functionalities, connector in mated condition and with caps in unmated position.

Electrical Data

Characteristic	Contact Size	Performance and Standard	
Contact Resistance over 10'000 Mating Cycles	Ø 0.5 mm Ø 0.7 mm Ø 0.9 mm	5 mΩ 5 mΩ 4 mΩ	IEC 60512-2-1-2a IEC 60512-2-2-2b
Insulation Resistance		> 10^{10} Ω; IEC 60512-3-1-3a	
Shielding Effectiveness [5]	- Grey - Black	> 65 dB (excellent) > 55 dB (very good)	up to 1 GHz, IEC 60512-23-3

[5] Size 08 connector pair.

Material & Surface Treatments

Metal Parts		Material		Finish	
		Designation ISO	Standard	Designation	Standard
Housing, Nut		Aluminium AlMgSiSn1Bi	EN-AW-6023	Chrome over Nickel	SAE-AMS 2460
		Brass CuZn39Pb3	CW614N UNS C 38500		
Back Nut (Plug)		Aluminium AlMgSiSn1Bi	EN-AW-6023	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404
		Brass CuZn39Pb3	CW614N UNS C 38500		
Ground Contact		Brass CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404
Contacts	- Male, Ground Pin - Female	Brass; CuZn39Pb3 Bronze; CuSn4Zn4Pb4	CW614N; UNS C 38500 CW456K; ASTM B 139 UNS C 54400	1µm Gold over Nickel	MIL-DTL-45204D Type I; ASTM B488
Insulator and Sealing		International Symbol	Flammability		
Insulator	- Molded	PBT	UL 94 V-0		
Inner Sleeve	- Cable connectors	POM	UL 94 HB		
O-rings	- General - Interface	FPM (Viton®) EPDM	UL 94 V-0 UL 94 HB		
Sealant Materials	- Cable connectors - Panel receptacles	Bi-component epoxy Silicon compound	- UL 94 V-0		
Overmolding Material	- Cable connectors	TPU	UL 94 V-0		

* Please contact your local sales office for other requirements.

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