

A large white line drawing of a circular connector is centered on the page. It shows multiple concentric rings with various shapes and notches, representing the internal and external components of the connector. The drawing is overlaid on a background of horizontal blue stripes and a faint image of a train.

Catalogue 2014 Circular Connectors

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1 General Information

1.1 GIMOTA INC

GIMOTA INC situated near Zurich Switzerland was founded in 1961 by Otto Schoch. At the beginning, the company has been specialized in supplying connectors for the use in railway vehicles. These are for example CIRCULAR CONNECTORS or DATA CONNECTORS. Future in-house developments concentrate on the same field of activities, particularly with regard to connectors for high-current and data transmission circuits for example the GIMOTA TRAC-Series and EMI shielded connectors.

GIMOTA connectors are used worldwide in various railway vehicles for practically all occurring applications. E.g. for high current feedings, conventional and electronic control systems, measuring probes of all kinds, analogue and digital data and signal transmission. All this is achieved under any installation conditions and in the most various subsystems on traction vehicles and in coaches. GIMOTA connectors are also used in stationary systems for various applications.

GIMOTA INC supplies to most of the leading European railway manufacturers and operators.

GIMOTA products are today more and more used for heavy duty industrial applications. Specially where increased strength and weather resistance are required.

GIMOTA INC provides flexible solutions for electrical and optical connections. The company develops and manufactures connectors for specialized applications according to customers specifications and needs and if required also in small batches.

Our customers count on GIMOTA INC as a reliable partner who on request is able to apply appropriate logistics solutions, such as „just-in-time“ deliveries based on a frame contracts and indicated forecasts or also maintaining minimum inventory levels specified by the customer.

GIMOTA INC is one of the leading suppliers of industrial traction connectors, and is continuously expanding its market share with close focus on its customers needs.

2 Circular Connectors General

2.1 Introduction

GIMOTA INC supplies since more than 50 years circular connectors, that conceive particularly for the hard service in railway vehicles and heavy industries.

These connectors correspond to the standards MIL-DTL-5015 and VG95234, they are available with Cases as follows:

- **Series GB:**

Standard design with bayonet coupling single guiding key, with elastic insert for pressed in crimp-contacts.

- **Series GR:**

Special design acc. to FS-standard with bayonet coupling and integrated waved ring spring. Bayonet engagement with steel slab. In other respects like GB Series.

- **Series GS:**

Special design by the way like GR Series with bayonet ring including rolling studs. Bayonet engagement with steel slab. In other respects like GB Series.

- **Series GT:**

Like GB Series, however with threaded coupling. These plugs are not presented in the catalog. They are available on request and recommended for indoor applications only.

- **Series GV:**

Like GB Series, but five guiding keys, with an extended Insert for better insulation at increased voltage. See chapter 6.1

- **Series GU:**

Like GS Series, but five guiding keys and available in size 48 only. See chapter 6.2

- **Series GM:**

Like GU Series, but modular construction. See chapter 6.3

The connectors series GB, GR and GS can be equipped as well as for indoor- as also for outdoor applications.

Depending on the used back shell the connection can be sealed up to IP69K.

The connectors suitable for outdoor applications have been tested according IEC EN 60529 and achieved IP65 / IP67 / IP68 (5bar) and IP69K according to DIN 40050.

For outdoor applications rubber coated bayonet rings with dust protection lips are recommended. In addition a back shell with sealed cable clamp or with an adapter for heat shrinkable shapes is required.

The main properties of these connectors are, in brief:

- Bayonet- coupling (threaded coupling on request)
- Contact layouts for up to 85 contacts
- Contacts for cross-sections available from 0,5 mm² up to 120 mm²
- High mechanical loading capacity
- Cases of (standard) Aluminium Alloy
- Surface treatments acc. 2.2.2
- On request: other surface coating, cases made of other materials
- Durable elastic Inserts made of:
 - ETHYLEN ACRILATE for high fire protection requirements (GIMOTA standard)
 - CHLOROPRENE for normal requirements
 - SILICONE for high temperatures
 - VITON for special requests
 - Thermoplast for special contacts
- Resistant against fuels, grease- and insulating oils
- Lifespan of 500 mating cycles at least.
- If not otherwise indicated all dimensions in mm
- Conductor cross-sections in mm² and AWG: Indicated size are nominal values and need to be verified case by case as they are dependant on wire construction. The suitability has to be checked by the user /applicant.

2.2 Technical specifications

2.2.1 Electrical characteristics

All electric data are valid on sea level with an environment temperature of 20 °C.
Deviating environment conditions have to be considered for connector evaluation.

Connectors

		Voltages				Insulation		
Voltage-Index	[-]	Operating Voltage		Test Voltage	Flash-over	Creepage Distance	CTI-Value	Insulating Resistance
		DC	AC					
		[V]	[V]	[VAC]	[VAC]	≥[mm]	IEC60664	[MΩ]
INST	MIL	250	200	1000	1400	1.6	≥ 300	≥ 5000
A	MIL	700	500	2000	2800	3.2	≥ 300	≥ 5000
B	MIL	2450	1750	4500	5700	7.9	≥ 300	≥ 5000
C	MIL	4200	3000	7000	8500	25.4	≥ 300	≥ 5000
D	MIL	1250	900	2800	3600	4.8	≥ 300	≥ 5000
E	MIL	1750	1250	3500	4500	6.3	≥ 300	≥ 5000
130V	SEV		130/250*				≥ 300	≥ 5000
250V	SEV		250/450*				≥ 300	≥ 5000
750V	ABB		750				≥ 300	≥ 5000
1000V	ABB		1000				≥ 300	≥ 5000
3000V	ABB		3000				≥ 300	≥ 5000

MIL: Requirements acc. to MIL-DTL-5015:
Values indicated on table above are applicable only if adequate safety measures are taken. That means the connection area of plug / Receptacle must be protected completely against pollution and humidity by an adequate cable clamp. Without safety precautions the operating voltage to grounding must not exceed 50 V.

SEV: Verifications SEV acc. to EN60998-1 (1993) Point 17.
*The higher operation voltage can be applied:

- if plug and Receptacle at the connection side completely are encapsulated of casting resin,
- or by means of heat shrinking shape, which are long enough from the cable insulation over the crimping area into the insert.

ABB: User-Tests by ABB / Bombardier INC Zurich, Switzerland

Contacts

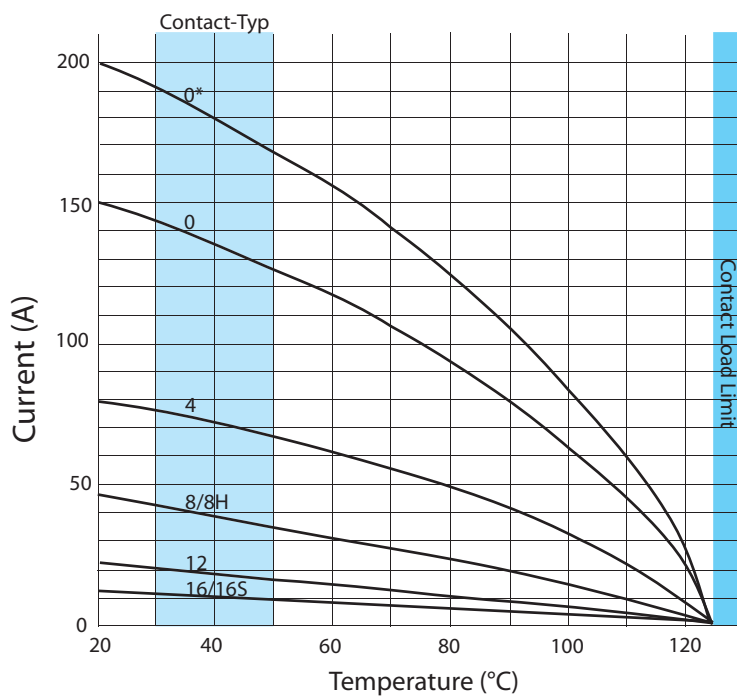
Size of Contacts			0*	0	4	8H	12	16/16S	20
Nominal current	continuous	[A]	200	150	80	56	23	13	7.5
Maximal current	short-term	[A]	300	245	135	90	41	22	7.5
Test current		[A]	240	200	110	72	35	20	9.0
Contact resistance ¹⁾		[mΩ]		≤ 0.2	≤ 0.5	≤ 1.0	≤ 3.0	≤ 6.0	≤ 10

¹⁾ Verification acc. to VG95234 / 2 / Test 5.10.1 and VG95210 / 37

0* Lamella contact for increased current transfer

Rating Diagram for Contacts

Admissible nominal current



The „Contact Load Limit“ corresponds to the permissible maximum temperature of the contacts.

The maximum application temperature of the plug / receptacle has to be considered.

2.2.2 Mechanical properties

Connectors

Bayonet coupling-torque ¹⁾			Connector sizes												
			10S	14S	16S	16	18	20	22	24	28	32	36	40	48
to lock	max.	[Nm]	1.7	1.8	2.0	2.0	4.0	5.0	6.0	6.5	7.0	8.0	9.0	10.0	10.0
to open	min.	[Nm]	0.45	0.55	0.63	0.63	1.00	1.50	1.50	2.00	2.70	3.60	4.50	5.90	5.90
	max.	[Nm]	1.7	1.8	2.0	2.0	4.0	5.0	6.0	6.5	7.0	8.0	9.0	10.0	10.0

¹⁾ Verification acc. to VG95319 / 2 / Test 5.8.2

Contacts

Size of contacts		0, 0*	4	8	8H	12	16/16S	20
Contact material		copper alloy						
Gold plated: 0.5 µm Au over 2.5 µm Ni		---	---	x	o	x	x	x
Silver plated: 3.5 µm Ag		x	x	o	x	o	o	o
Contact mating force ¹⁾	nom. [N]	42.5	20	15	15	7.5	5	1.8
Contact separating force	nom. [N]	8.5	4	3	3	1.5	1	0.3

Plating on contact area: **x** = standard, **o** = on demand

¹⁾ Verification acc. to VG95319 / 2 / Test 5.4 and 5.7

0* with Lamella for increased current transfer.

Shell parts

Surface treatment code	A*	B	C*	E
Shell-material	Aluminium alloy copper alloy (leadfree)		Aluminium alloy copper alloy (leadfree) stainless steel	
Surface treatment	zinc-cobalt		epoxy-polyurethan	electroless nickel
Type of surface	passivated		varnished	–
Surface colour	black	dark olivegreen	black	blank
Thickness of surface treatment	12 – 15 µm		13 – 16 µm	12 – 15 µm
Conformity of RoHS	yes	no	yes	yes
Corrosion resistance ¹⁾	200 h	48 h	500 h	48 h
Operating temperature	–55 to +90 °C		–55 to +125 °C	–55 to +125 °C
Temperature shock ²⁾	–55 to +125 °C		–55 to +125 °C	–55 to +125 °C
Electical conductivity ³⁾	≤ 0.5 mΩ	≤ 0.5 mΩ	non conductive	≤ 0.5 mΩ

¹⁾ Verification acc. to MIL 1344A Test 1001.1

²⁾ Verification acc. to MIL 202F Method 107G

³⁾ Verification acc. to MIL 1344A Test 3007

* According to GIMOTA preferences for outdoor use

2.2.3 Thermal properties / Fire characteristics

Contact inserts

Material-Code	C	E*	S	T
Material	chloroprene	ethylene acrylate GFX	silicone	thermoplastic
Operat. temperature	-55 to +125 °C	-55 to +150 °C	-55 to +200 °C	-40 to +130 °C
Fire protection class UL94	HB	V0 ¹⁾	V0 ¹⁾	-
Fire protection class NFF 16-101/102	-	I3/F0	-	I3/F3
Fire protection class DIN 5510	-	S4/SR2/ST2	-	-

¹⁾ Flame retardant, halogen-free.

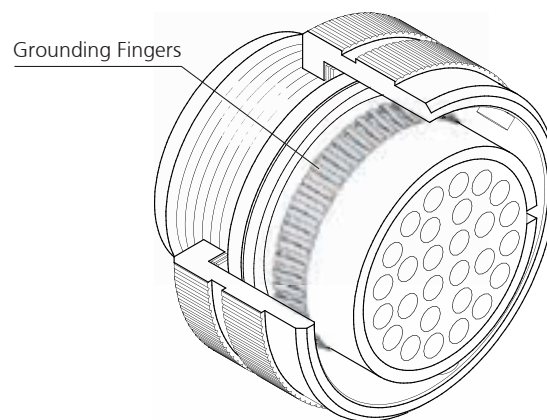
* GIMOTA standard.

2.2.4 Electromagnetic compatibility (EMC)

EMI-shielding (Electromagnetic Interference)

The EMI shielding of the plugs is ensured by grounding fingers, a shielding system with a springcontact ring, which guarantees an optimal 360° shield contactation. Shielding current is discharged over the connector shells. Conductive surface treatment for plugs and receptacles is required.

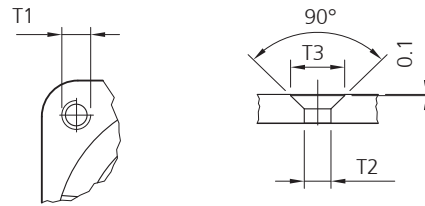
See surface treatments on shell parts at chapter 2.2.2.



2.2.5 Dimensions

Receptacles with flange:

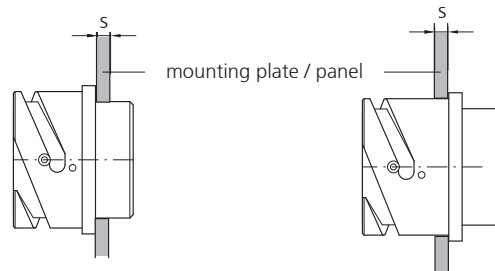
Type of fastening holes



Size	Threaded holes	Through holes	Countersunk holes 90°	
	T1	T2 - H13	T2 - H13	T3
10SL	M4	3.2	3.2	6.5
14S	M4	3.2	3.2	6.5
16/16S	M4	3.2	3.2	6.5
18	M4	3.2	3.2	6.5
20	M4	3.2	3.2	6.5
22	M4	3.2	3.2	6.5
24	M5	3.7	3.7	7.5
28	M5	3.7	3.7	7.5
32	M5	4.3	4.3	8.0
36	M5	4.3	4.3	8.5
40	M5	4.3	4.3	8.5

Reference table for max. panel thickness

If plugs used with rubber coated bayonet rings the dimensions need to be checked individually.

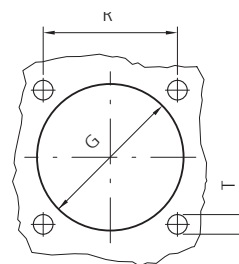


Size	Front-panel mounting (receptacles 20/21/26)	Rear panel mounting (receptacles 30/32/36/38)
	s max.	s max.
10SL	3.70	7.20
14S	3.70	7.20
16/16S	3.70	7.20
18	3.70	7.50
20	3.70	7.50
22	3.70	7.50
24	5.25	7.50
28	5.25	7.50
32	6.10	7.50
36	6.10	7.50
40	6.00	7.50

Dimensions regarding front-panel mounting need to be considered only if a backshell is used.

Panel cut-out

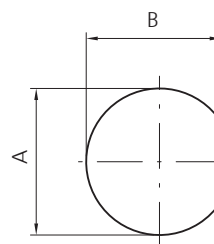
for receptacles with flange



Size	R +/-0.1	G		T	
		Front panel mounting	Rear panel mounting	with through holes	with threaded holes
10SL	18.2	17.0	19.1	3.4	4.5
14S	23.0	20.0	25.5	3.4	4.5
16/16S	24.6	23.0	28.3	3.4	4.5
18	27.0	26.5	31.7	3.4	4.5
20	29.4	30.0	35.0	3.4	4.5
22	31.8	33.0	38.3	3.4	4.5
24	34.9	36.0	41.8	3.9	5.5
28	39.7	42.0	47.6	3.9	5.5
32	44.5	48.5	54.3	4.5	5.5
36	49.2	55.0	60.5	4.5	5.5
40	55.5	61.0	66.4	4.5	5.5

Cut-out/die cut

for jam nut receptacles



Size	A +0.25 / -0	B +0 / -0.35	Panel thickness	
			Min.	Max.
10SL	22.40	21.00	2.4	5.2
14S	28.75	27.40	2.4	7.5
16/16S	31.95	30.95	2.4	7.5
18	35.10	33.75	2.4	9.0
20	38.30	36.85	2.4	9.0
22	41.45	40.05	2.4	9.1
24	44.65	43.35	2.4	9.1
28	51.00	49.55	2.4	8.5
32	57.35	55.95	2.4	6.5
36	63.70	62.35	2.4	8.3
40	70.05	68.55	2.4	8.3

2.3 Selection of connectors

2.3.1 How to evaluate

How to evaluate the correct circular connector?

We recommend to follow the instructions below to determine the relevant criterions:

Please also try the numbering generator on www.gimota.ch for easy evaluation.

I. Desing characteristics

► 2.3.2 Numbering key

- | | | | |
|-------|--|----------------------------|--|
| II. | To select the connector series
► Note the respective | Connector series 1) | |
| III. | To select the shell type
► Note the respective | Shell code 2) | |
| IV. | To select accessories
► back shell, cable clamp etc. | Accessories code 3) | |
| V. | Contact insert
► 2.3.3 and 2.3.5 Contact inserts, overview | | |
| VI. | To determine the number of contacts
► Number of poles | Number of contacts total | |
| VII. | To choose the contact insert
► 2.3.3 and 2.3.5 „Layout Listing“ acc. to number of contacts
1. Look for the requested (or for the proximate upper) number of contacts in the tables.
2. Choose, in consideration of size of contacts and of voltage-index, (2.2.1 electrical properties) the layout according to requirements and write down the respective layout Identification. | | |
| | | Layout 4) | |
| | The layout also defines the connector size.
If you can not find a layout according to your requirements, please contact your local Gimota partner or Gimota headoffice to check availabilities for an individual implementation. | | |
| VIII. | To determine the type of contacts
► 1. socket contact (S)
► 2. pin contact (P) | Contact-code 5) | |

Recomendation:

Select **socket contacts (S) for the receptacles**, if in uncoupled condition power is on these contacts

(touch protection).

If there is no tension in uncoupled condition, we recommend **socket conntacts (S) to be used on plug side (mechanical protection).**

IX. To decide the coding (rotation of contact insert according to 2.3.4)

▶ **2.3.5 „Inserts Listing“ acc. to size and numbering**

Choose in tables one of the possible coding-positions **W, X, Y** or **Z** for the identified layout. Not available coding-position in the tables means, that the Insert is available with coding **N** only.

Coding **6)**

X. To select materials and surface

▶ 1. Material of insert Material-code **7)**

▶ 2. Material of shell Material-code **8a)**

▶ 3. Surface of shell parts Surface-code **8b)**

Material and surface as chosen are normally the same for all shell parts.

XI. Special-Designs

Allocation of the modification code given by **GIMOTA INC** only.

9)

XII. To decide the Item-Number

The Item Number is accomplished by the codes **1) – 9)** in ascending order. After code **6)** a hyphen has to be added.

Example:

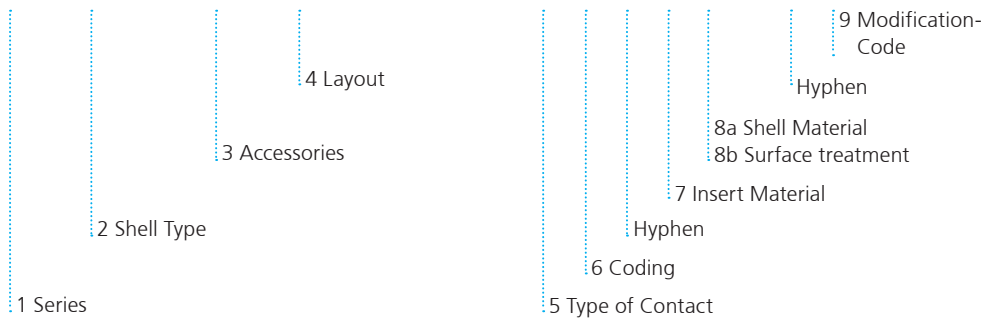
1)	2)	3)	4)	5)	6)		7)	8a)	8b)	9)
G B	0 6 1	X E	1 0 S L - 4	P	N	-	C	A	A	Z 9 9

Please also consider our conditions concerning ‚Product Safety‘, at chapter 8.1.

2.3.2 Numbering Key

Plugs and Receptacles - Part configuration

1)	2)	3)	4)					5)	6)		7)	8a)	8b)		9)							
A	A	N	N	N	A	A	X	X	X	X	X	X	A	A	-	A	A	A	-	A	N	N



Explanations and indications:

A, A	Capital letter
N, N	Numeral
X, X	Capital letter or numeral or Hyphen

bold:	must be specified
normal:	to specify if requested
No	spacing!

Allocation of the different Codes

1 Series:

- GB** Bayonet for connector with 1 guiding Key, press-in contacts
- GR** Bayonet connector with 1 guiding Key. Stell slab at bayonet ramp locking edge, integrated waved Ring Spring, rest according to **GB**
- GS** Bayonet Connector with 1 guiding Key, with additionally rolling Studs at bayonet ring, rest according to **GR**
- GT** according to **GB**, but with threaded coupling

2 Shell Type:

2.1 Plug without accessory:

60 Plug

2.2 Plug including accessory:

06 Plug, straight

08 Plug, 90° elbow

a) Additional-codes for plugs:

- 1** EMI (Grounding-Fingers)
- 2** Rubber coated bayonet ring
- 3** Rubber coated bayonet ring, short
- 4** Rubber coated bayonet ring + EMI
- 5** Rubber coated bayonet ring, short + EMI

2.3 Receptacle without accessory:

- 11** Inline receptacle
- 20** Front panel mount receptacle, without accessory-thread

21 Front panel mount receptacle, with accessory-thread

30 Rear panel mount receptacle, without accessory-thread

32 Rear panel mount receptacle, with accessory-thread + interlock

40 Front panel mount dummy receptacle

70 Jam nut receptacle, without accessory-thread

72 Jam nut receptacle, with accessory-thread + interlock

2.4 Receptacle with accessory:

16 Inline receptacle, straight

26 Front panel mount receptacle, straight

36 Rear panel mount receptacle, straight, interlock

38 Rear panel mount receptacle, 90° elbow

76 Jam nut receptacle, straight suitable for EMI use

78 Jam nut receptacle, 90° elbow, interlock suitable for EMI use

b) Additional-codes for receptacles:

0 Trough fixing holes

1 Threaded fixing holes

2 Countersunk fixing holes

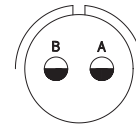
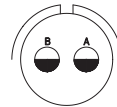
- 3 Accessory:**
- if no Accessory used set a Hyphen
 - B** with thermoplastic cable clamp only
 - G** with grommet only
- S with back shell, normal:**
- SA** Back shell only
 - SB** Back shell and metallic cable clamp type C
 - SC** Back shell and metallic cable clamp type C + grommet
 - SD** Back shell and metallic cable clamp type A
 - SE** Back shell and metallic cable clamp type A + bushing
 - SF** Back shell and metallic cable clamp type A + bushing + grommet
 - SG** Back shell + grommet
 - SK** Back shell + corrugated conduit fitting (female)
 - SR** Termination back shell type R + grommet
- L with back shell, long:**
- LA** with back shell long only
 - LB** Back shell long and metallic cable clamp Type C
 - LC** Back shell long and metallic cable clamp type C + grommet
 - LD** Back shell long and metallic cable clamp type A
 - LE** Back shell long and metallic cable clamp type A + bushing
 - LF** Back shell long and metallic cable clamp type A + bushing + grommet
- X with back shell, special:**
- XA** Single body for heat shrinkable shape
 - XB** Single body for heat shrinkable shape + grommet
 - XC** Free nut back shell for heat shrinkable shape
 - XD** Free nut back shell for heat shrinkable shape + grommet
 - XE** EMI Adaptor with shielding sleeve
 - XF** EMI Adaptor with cone ring and for heatshrinkable shape
 - XG** Back shell with female thread „M“
 - XH** Back shell with female thread „M“ + grommet
 - XJ** Back shell with female thread „PG“
 - XK** Back shell with female thread „PG“ + grommet
 - XL** EMI Adaptor with IRIS- spring and strain relief
 - XM** Reducer back shell with cable clamp type C
 - XN** Enlarger back shell with cable clamp type C
 - XO** Reducer back shell with metallic cable clamp type A
 - XP** Enlarger back shell with metallic cable clamp type A
 - XT** Back shell to apply rubber hoses (UNI4883)
 - XX** Special custom made back shell
- 4 Layout/Arrangement:**
- Complete identification of the selected pole arrangement:
Examples from **10SL-3** to **48-58**
- 5 Type of Contact:**
- P** Pin contacts
 - S** Socket contacts
- 6 Coding:**
- N** No coding
 - W** Coding angle W
 - X** Coding angle X
 - Y** Coding angle Y
 - Z** Coding angle Z
- 7 Insert material:**
- C** Chloroprene CR
 - E** Ethylene acrylate GXF
 - S** Silikon
 - T** Thermoplastic IXEF
- 8a Shell material:**
- A** Aluminium alloy
 - B** Copper alloy, lead-free
 - C** Stainless steel
 - D** Thermoplastic
- 8b Surface treatment:**
- A** Zinc-cobalt, black [*conductivee, RoHS*]
 - *) B** Zinc-cobalt, olive drab [*conductivee, not RoHS*]
 - C** Polyurethane varnished, black [*not for EMI use, RoHS*]
 - E** Electro less Nickel [*conductivee, RoHS*]
- 9 Modification Codes:**
- XXX**
Part List Number for Special Connectors:
Defined by GIMOTA INC. only
- SC1** solder contacts gold, included in connector part
 - SC2** solder contacts silver, included in connector part
- *) To be discontinued**

2.3.3 Contact insert, overview

Layout listing acc. to number of contacts

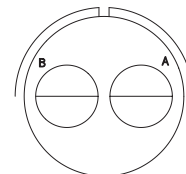
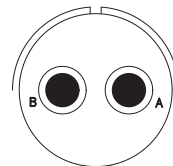
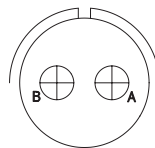
2 Contact

Front view
to pins



Layout	10SL-4	14S-9	16S-4
Number of contacts	2	2	2
Size of contacts	16S	16S	16S
Voltage-class	A	A	D
Grommet	x	x	x

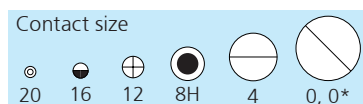
Front view
to pins



Layout	18-3	22-1	24-9
Number of contacts	2	2	2
Size of contacts	12	8H	4
Voltage-class	D	D	A
Grommet	o	x	x

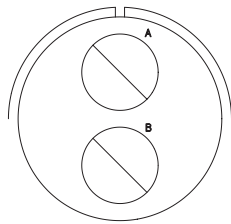
x = Grommet available
o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.



2 Contact

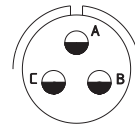
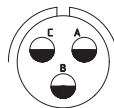
Front view
to pins



Layout	32-5
Number of contacts	2
Size of contacts	0, 0*
Voltage-class	D
Grommet	x

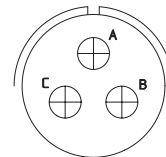
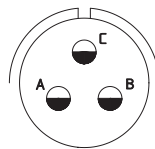
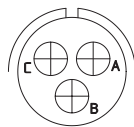
3 Contact

Front view
to pins



Layout	10SL-3	14S-7 (14S-1)	16S-5
Number of contacts	3	3	3
Size of contacts	16S	16S	16S
Voltage-class	A	A	A
Grommet	x	x	x

Front view
to pins



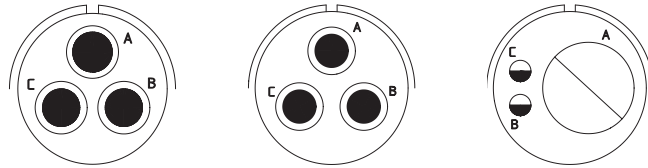
Layout	16-10	18-22	20-3
Number of contacts	3	3	3
Size of contacts	12	16	12
Voltage-class	A	D	D
Grommet	o	x	x

x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.

Contact size

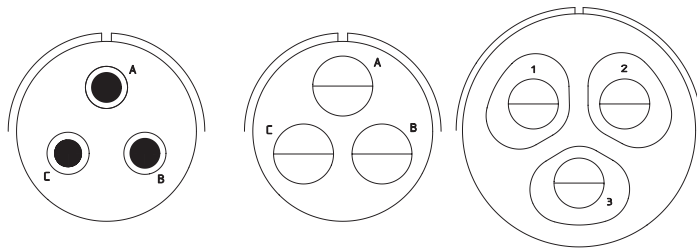
3 Contact

Front view
to pins



Layout	22-19	22-2	22-21	
Number of contacts	3	3	1	2
Size of contacts	8H	8H	0, 0*	16
Voltage-class	A	D	A	
Grommet	x	o	x	

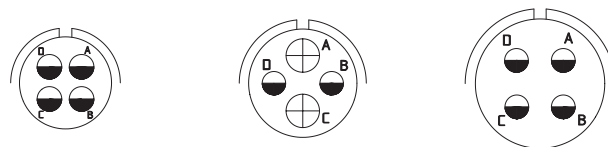
Front view
to pins



Layout	28-3	28-6	40-A3
Number of contacts	3	3	3
Size of contacts	8H	4	4
Voltage-class	E	D	ABB3000V
Grommet	o	o	o

4 Contact

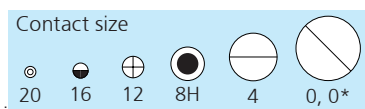
Front view
to pins



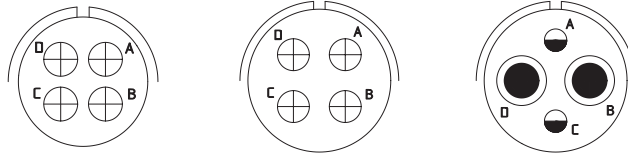
Layout	14S-2	16-9		18-4
Number of contacts	4	2	2	4
Size of contacts	16S	12	16	16
Voltage-class	INST	A		D
Grommet	x	o		x

x = Grommet available
o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.

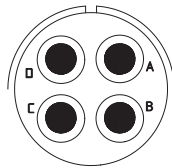


Front view
to pins



Layout	18-10	20-4	20-24	
Number of contacts	4	4	2	2
Size of contacts	12	12	8H	16
Voltage-class	A	D	A	
Grommet	x	x	o	

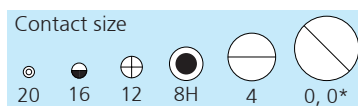
Front view
to pins



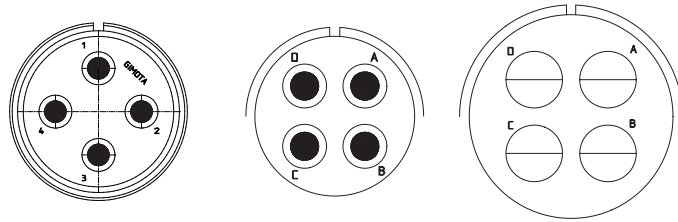
Layout	22-22
Number of contacts	4
Size of contacts	8H
Voltage-class	A
Grommet	o

x = Grommet available
o = for grommet ask GIMOTA

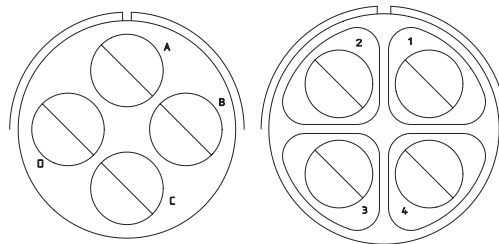
You will find more information about the voltage class see chapter 2.2.1.



4 Contact

 Front view
to pins


Layout	24-A4	24-22	32-17
Number of contacts	4	4	4
Size of contacts	8H	8H	4
Voltage-class	ABB1000V	D	D
Grommet	o	x	x

 Front view
to pins


Layout	36-5	40-A4
Number of contacts	4	4
Size of contacts	0, 0*	0, 0*
Voltage-class	A	ABB 750V/E
Grommet	o	o

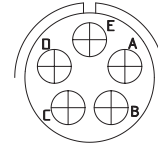
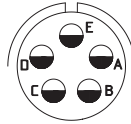
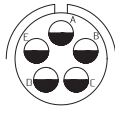
x = Grommet available
o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.

Contact size						
20	16	12	8H	4	0, 0*	

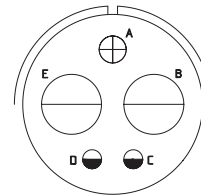
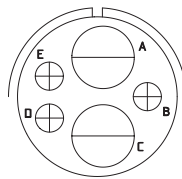
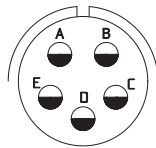
5 Contact

Front view to pins



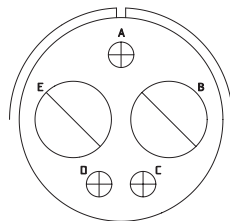
Layout	14S-5	16S-8	18-11
Number of contacts	5	5	5
Size of contacts	16S	16S	12
Voltage-class	INST	A	SEV 130V / A
Grommet	x	o	x

Front view to pins



Layout	18-20	24-12	28-5
Number of contacts	5	2 3	2 1 2
Size of contacts	16	4 12	4 12 16
Voltage-class	A	A	D
Grommet	x	o	o

Front view to pins

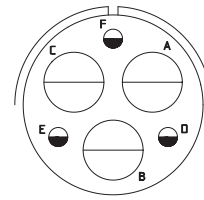
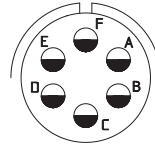
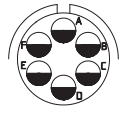


Layout	32-1
Number of contacts	2 3
Size of contacts	0, 0* 12
Voltage-class	A = E / B, C, D, E = D
Grommet	x

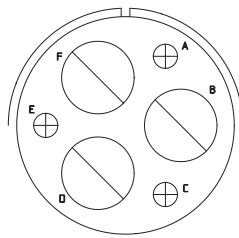
x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.

Contact size

6 Contact

 Front view
to pins


Layout	14S-6	18-12	28-22	
Number of contacts	6	6	3	3
Size of contacts	16S	16	4	16
Voltage-class	INST	A	D	
Grommet	x	x	o	

 Front view
to pins


Layout	36-3	
Number of contacts	3	3
Size of contacts	0, 0*	12
Voltage-class	D	
Grommet	o	

x = Grommet available

o = for grommet ask GIMOTA

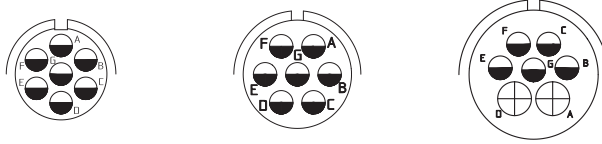
You will find more information about the voltage class see chapter 2.2.1.

Contact size



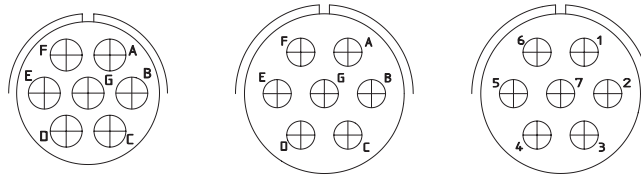
7 Contact

Front view to pins



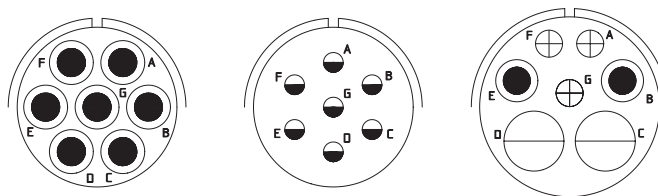
Layout	14S-A7	16S-1	18-9	
Number of contacts	7	7	2	5
Size of contacts	16S	16S	12	16
Voltage-class	INST	A	INST	
Grommet	o	x	o	

Front view to pins



Layout	20-15	24-2	24-07
Number of contacts	7	7	7
Size of contacts	12	12	12
Voltage-class	A	D	SEV 130V / D
Grommet	x	x	o

Front view to pins



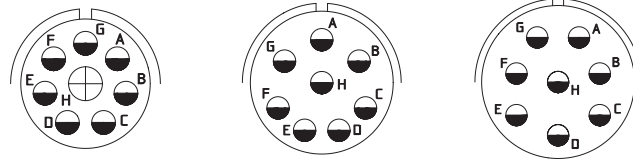
Layout	24-10	24-27	28-10		
Number of contacts	7	7	2	2	3
Size of contacts	8H	16	4	8H	12
Voltage-class	A	E	G = D/Rest = A		
Grommet	o	x	o		

x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.

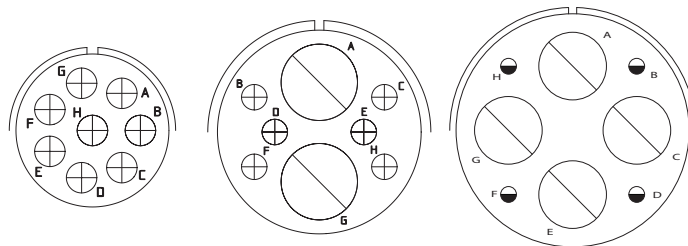
Contact size

20 16 12 8H 4 0, 0*

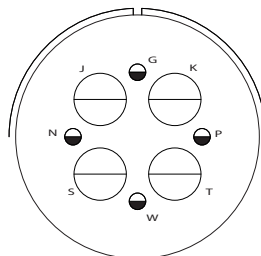
8 Contact

 Front view
to pins


Layout	18-8		20-7	22-18	
Number of contacts	1	7	8	8	
Size of contacts	12	16	16	16	
Voltage-class	A		A, B, G, H = D C, D, E, F = A	A, B, F, G, H = D Rest = A	
Grommet	x		x	x	

 Front view
to pins


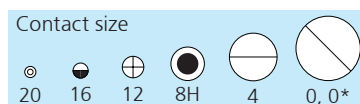
Layout	22-23		32-15		40-A8	
Number of contacts	8		2	6	4	4
Size of contacts	12		0, 0*	12	0, 0*	16
Voltage-class	H = D/Rest = A		D		E	
Grommet	x		o		x	

 Front view
to pins


Layout	40-A10	
Number of contacts	4	4
Size of contacts	4	16
Voltage-class	D	
Grommet	x	

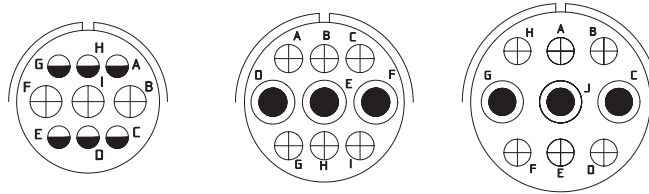
x = Grommet available
o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.



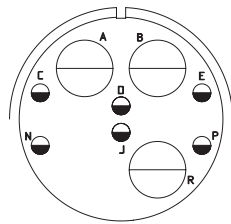
9 Contact

Front view to pins



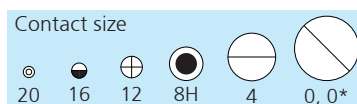
Layout	20-18		24-11		28-1	
Number of contacts	3	6	3	6	3	6
Size of contacts	12	16	8H	12	8H	12
Voltage-class	A		A		A, E, J = D/Rest = A	
Grommet	o		o		x	

Front view to pins

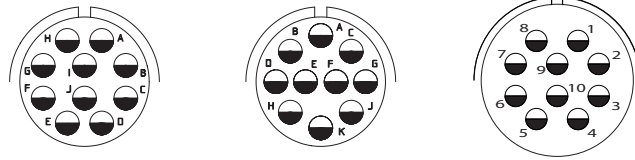


Layout	32-A9	
Number of contacts	3	6
Size of contacts	4	16
Voltage-class	A	
Grommet	o	

x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.

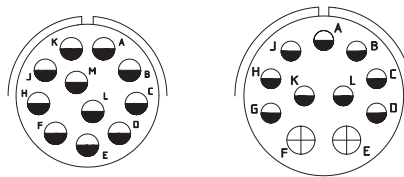


10 Contact

 Front view
to pins


Layout	18-1	18-19	22-A10
Number of contacts	10	10	10
Size of contacts	16	16	16
Voltage-class	B, C, F, G = A Rest = INST	A	A
Grommet	x	x	x

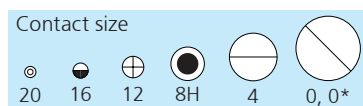
11 Contact

 Front view
to pins


Layout	20-33	24-20	
Number of contacts	11	2	9
Size of contacts	16	12	16
Voltage-class	A	D	
Grommet	o	x	

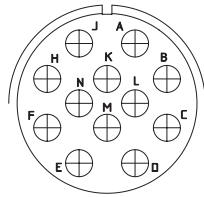
x = Grommet available
o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.



12 Contact

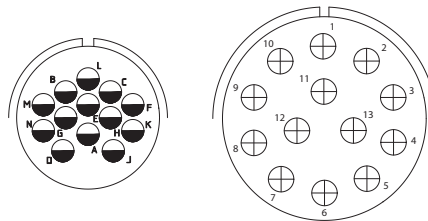
Front view
to pins



Layout	28-51
Number of contacts	12
Size of contacts	12
Voltage-class	D
Grommet	x

13 Contact

Front view
to pins

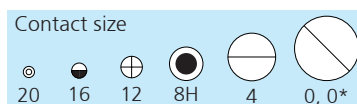


Layout	20-11	32-013
Number of contacts	13	13
Size of contacts	16	12
Voltage-class	INST	SEV 250V / D
Grommet	x	x

x = Grommet available
o = for grommet ask GIMOTA

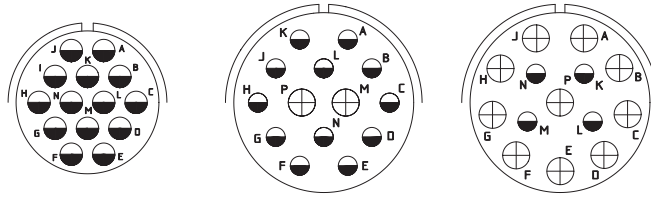
You will find more information about the voltage class see chapter 2.2.1.

Contact size

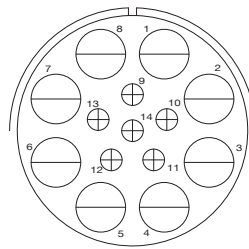


20 16 12 8H 4 0, 0*

14 Contact

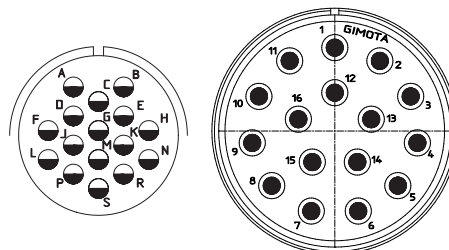
 Front view
to pins


Layout	20-27	28-2		28-20	
Number of contacts	14	2	12	10	4
Size of contacts	16	12	16	12	16
Voltage-class	A	D		A	
Grommet	x	o		o	

 Front view
to pins


Layout	40-A14	
Number of contacts	8	6
Size of contacts	4	16
Voltage-class	A	
Grommet	x	

16 Contact

 Front view
to pins


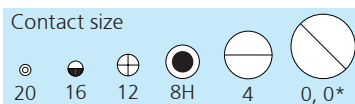
Layout	24-5	40-A16
Number of contacts	16	16
Size of contacts	16	8H
Voltage-class	A	ABB 1000V
Grommet	x	o

x = Grommet available

o = for grommet ask GIMOTA

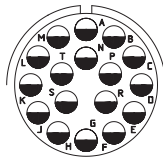
You will find more information about the voltage class see chapter 2.2.1.

Contact size



17 Contact

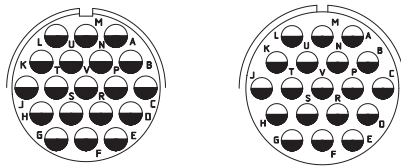
Front view to pins



Layout	20-29
Number of contacts	17
Size of contacts	16
Voltage-class	A
Grommet	x

19 Contact

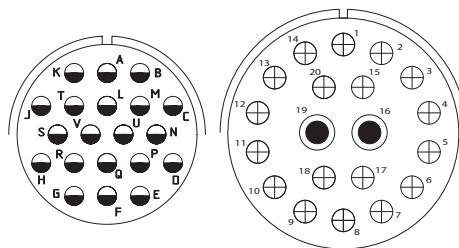
Front view to pins



Layout	20-A48	22-14
Number of contacts	19	19
Size of contacts	16	16
Voltage-class	INST	A
Grommet	o	x

20 Contact

Front view to pins



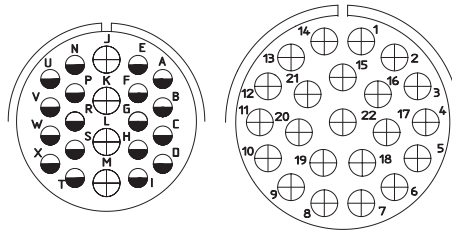
Layout	28-16	40-A20
Number of contacts	20	2 18
Size of contacts	16	8H 12
Voltage-class	A	A
Grommet	x	x

x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.

Contact size

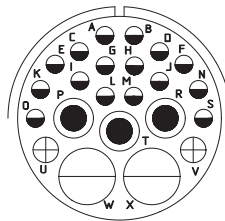
20 16 12 8H 4 0, 0*

22 Contact

 Front view
to pins


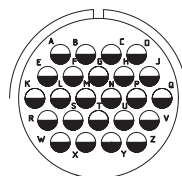
Layout	28-11	36-A22
Number of contacts	4	18
Size of contacts	12	16
Voltage-class	A	D
Grommet	x	x

23 Contact

 Front view
to pins


Layout	32-6			
Number of contacts	2	3	2	16
Size of contacts	4	8H	12	16
Voltage-class	A			
Grommet	o			

24 Contact

 Front view
to pins


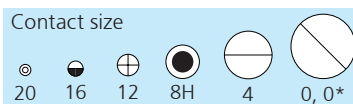
Layout	24-28
Number of contacts	24
Size of contacts	16
Voltage-class	INST
Grommet	x

x = Grommet available

o = for grommet ask GIMOTA

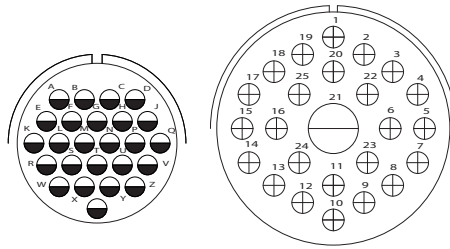
You will find more information about the voltage class see chapter 2.2.1.

Contact size



25 Contact

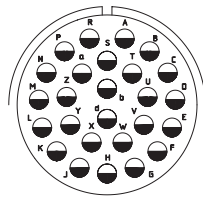
Front view
to pins



Layout	24-A25	40-A25	
Number of contacts	25	1	24
Size of contacts	16	4	12
Voltage-class	INST	A	
Grommet	x	x	

26 Contact

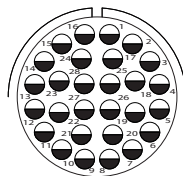
Front view
to pins



Layout	28-12
Number of contacts	26
Size of contacts	16
Voltage-class	A
Grommet	x

28 Contact

Front view
to pins



Layout	24-A28
Number of contacts	28
Size of contacts	16
Voltage-class	INST
Grommet	x

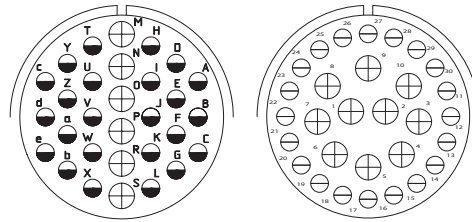
x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.

Contact size

20 16 12 8H 4 0, 0*

30 Contact

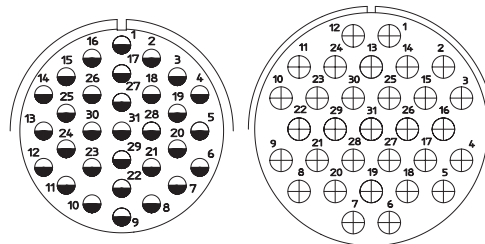
Front view
to pins



Layout	32-8		32-A30	
Number of contacts	6	24	10	20
Size of contacts	12	16	12	16
Voltage-class	A		A	
Grommet	o		x	

31 Contact

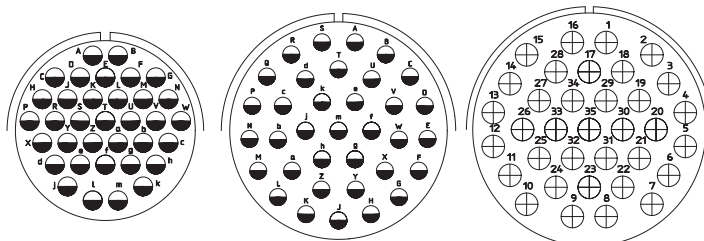
Front view
to pins



Layout	32-31	40-31
Number of contacts	31	31
Size of contacts	16	12
Voltage-class	SEV 130V / A	D
Grommet	x	o

35 Contact

Front view
to pins

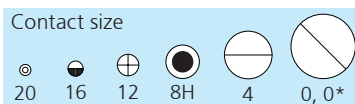


Layout	28-15	36-15	40-35
Number of contacts	35	35	35
Size of contacts	16	16	12
Voltage-class	A	M = D/Rest = A	SEV 130V / D
Grommet	x	x	x

x = Grommet available
o = for grommet ask GIMOTA

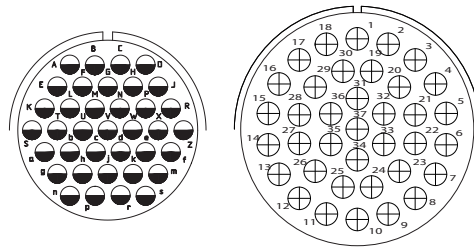
You will find more information about the voltage class see chapter 2.2.1.

Contact size



37 Contact

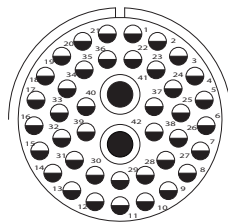
Front view to pins



Layout	28-21	40-B37
Number of contacts	37	37
Size of contacts	16	12
Voltage-class	A	A
Grommet	x	o

42 Contact

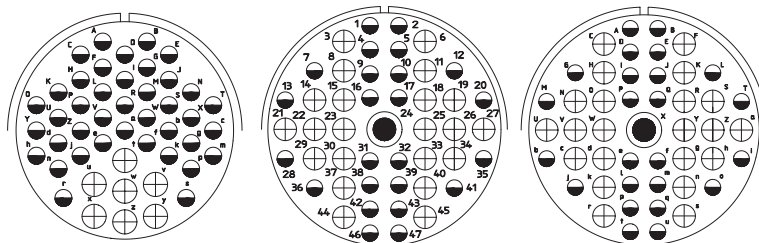
Front view to pins



Layout	32-59	
Number of contacts	2	40
Size of contacts	8H	16
Voltage-class	A	
Grommet	x	

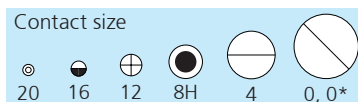
47 Contact

Front view to pins



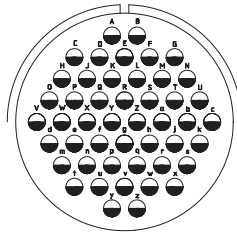
Layout	36-7		40-A47			40-9		
Number of contacts	7	40	1	22	24	1	22	24
Size of contacts	12	16	8H	12	16	8H	12	16
Voltage-class	A		A			A		
Grommet	x		o			o		

x = Grommet available
 o = for grommet ask GIMOTA
 You will find more information about the voltage class see chapter 2.2.1.



48 Contact

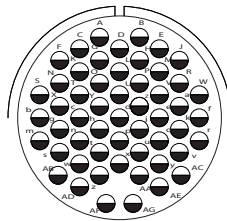
Front view
to pins



Layout	36-10
Number of contacts	48
Size of contacts	16
Voltage-class	A
Grommet	x

54 Contact

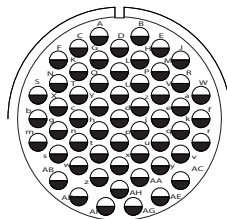
Front view
to pins



Layout	32-22
Number of contacts	54
Size of contacts	16
Voltage-class	A
Grommet	x

55 Contact

Front view
to pins



Layout	32-A55
Number of contacts	55
Size of contacts	16
Voltage-class	A
Grommet	o

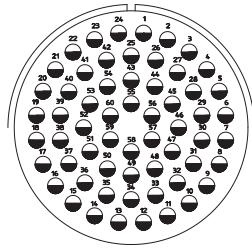
x = Grommet available

o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.

Contact size

20 16 12 8H 4 0,0*

60 ContactFront view
to pins

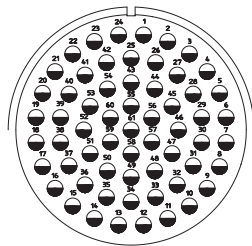
Layout	40-A60
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Number of contacts	60
---------------------------	----

Size of contacts	16
-------------------------	----

Voltage-class	A
----------------------	---

Grommet	x
----------------	---

61 ContactFront view
to pins

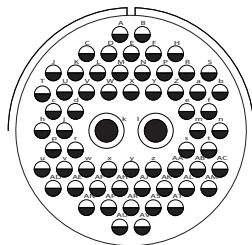
Layout	40-63
---------------	--------------

Number of contacts	61
---------------------------	----

Size of contacts	16
-------------------------	----

Voltage-class	SEV 130V / A
----------------------	--------------

Grommet	x
----------------	---

62 ContactFront view
to pins

Layout	40-A62
---------------	---------------

Number of contacts	2	60
---------------------------	---	----

Size of contacts	8H	16
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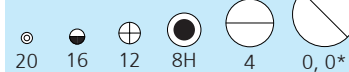
Voltage-class	A
----------------------	---

Grommet	o
----------------	---

x = Grommet available
o = for grommet ask GIMOTA

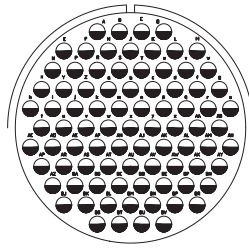
You will find more information about the voltage class see chapter 2.2.1.

Contact size



85 Contact

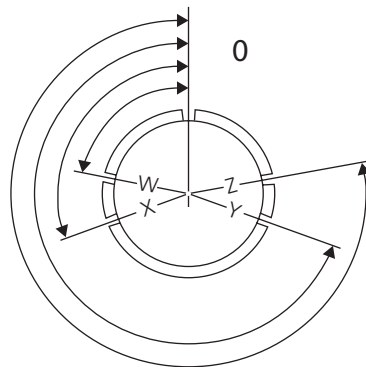
Front view to pins



Layout	40-56
Number of contacts	85
Size of contacts	16
Voltage-class	A
Grommet	x

2.3.4 Coding

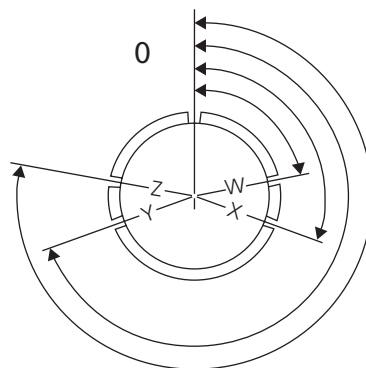
Front view to pin contact insert:



If several connectors with the same layout are applied side by side, the contact inserts can be rotated by a defined angle. This coding will avoid false mating of the connections.

The contact inserts of the corresponding plug and receptacle have both to be rotated accordingly.

Front view to socket contact insert:



x = Grommet available
o = for grommet ask GIMOTA

You will find more information about the voltage class see chapter 2.2.1.

Contact size

⊙	●	⊕	⦿	◐	◑
20	16	12	8H	4	0, 0*

2.3.5 Inserts listing acc. to size and pole-layout

Layout of inserts		Contacts total	Size of contacts				Coding				Grommet	Voltage-class	
			0, 0*	4	8H	12	16	W	X	Y			Z
10SL	-3	3					# 3	-	-	-	-	x	A
	-4	2					# 2	-	-	-	-	x	A
14S	-2	4					# 4	-	120	240	-	x	INST
	-5	5					# 5	-	110	-	-	x	INST
	-6	6					# 6	-	-	-	-	x	INST
	-7 (-1)	3					# 3	-	-	-	-	x	A
	-A7	7					# 7	-	-	-	-	o	INST
	-9	2					# 2	70	145	215	290	x	A
16S	-1	7					# 7	80	-	-	280	x	A
	-4	2					# 2	35	110	250	325	x	D
	-5	3					# 3	70	145	215	290	o	A
	-8	5					# 5	-	170	265	-	o	A
16	-7 ¹	3			1		2	80	110	250	280	o	A
	-9	4				2	2	35	110	250	325	o	A
	-10	3				3		-	120	240	-	o	A
	-11 ¹	2				2		35	110	250	325	o	A
	-12 ¹	1		1				90	-	-	280	o	A
18	-1	10					10	80	110	250	280	x	B, C, F, G = A Rest = INST
	-3	2				2		35	110	250	325	o	D
	-4	4					4	35	110	250	325	x	D
	-5 ¹	3				2	1	80	110	250	280	o	D
	-6 ¹	1		1				-	-	-	-	o	D
	-8	8				1	7	70	-	-	290	x	A
	-9	7				2	5	80	110	250	280	o	INST
	-10	4				4		-	120	240	-	x	A
	-11	5				5		-	170	265	-	x	SEV130V/A
	-12	6					6	80	-	-	280	x	A
	-13 ¹	4			1	3		80	110	250	280	o	A
	-14 ¹	2		1			1	80	110	250	280	o	A
	-16 ¹	1				1		-	-	-	-	o	C
	-19	10					10	-	120	240	-	x	A
-20	5					5	90	180	270	-	x	A	
-22	3					3	70	145	215	290	x	D	
20	-2 ¹	1	1					-	-	-	-	o	D
	-3	3				3		70	145	215	290	x	D
	-4	4				4		45	110	250	-	x	D
	-7	8					8	80	110	250	280	x	A, B, G, H = D C, D, E, F = A
	-8 ¹	6			2		4	80	110	250	280	o	INST
	-11	13					13					x	INST
	-15	7				7		80			280	x	A
-16 ¹	9				2	7	35	110	250	280	o	A	

Contact size 16S requested (S = short)

¹ Ask your GIMOTA-Partner regarding the availability of this insert.

x = Grommet available

o = for grommet ask GIMOTA

Layout of inserts	Contacts total	Size of contacts				Coding				Grommet	Voltage-class	
		0, 0*	4	8H	12	16	W	X	Y			Z
20	-17 ¹	6			5	1	90	180	270	-	o	A
	-18	9			3	6	35	110	250	325	o	A
	-19	3		3			90	180	270	-	x	A
	-21 ¹	9			1	8	35	110	250	325	o	A
	-22 ¹	6		3		3	80	110	250	280	o	A
	-23 ¹	2		2			35	110	250	325	o	A
	-24	4		2		2	35	110	250	325	o	A
	-27	14				14	35	110	250	325	x	A
	-29	17				17	80	-	-	280	x	A
	-33	11				11	-	-	-	-	o	A
-A48	19				19	-	80	280	-	o	INST	
22	-1	2		2			35	110	250	325	x	D
	-2	3		3			70	145	215	290	o	D
	-4 ¹	4		2	2		35	110	250	325	o	A
	-5 ¹	6			2	4	-	-	-	-	o	D
	-6 ¹	3		2		1	80	110	250	280	o	D
	-7 ¹	1	1				-	-	-	-	o	E
	-8 ¹	2			2		35	110	250	325	o	E
	-9 ¹	3			3		70	145	215	290	o	E
	-A10	10				10	-	120	240	-	x	A
	-11 ¹	2				2	35	110	250	325	o	B
	-12 ¹	5		2		3	80	110	250	280	o	D
	-14	19				19	80	110	250	280	x	A
	-15 ¹	6			5	1	80	110	250	280	o	D = E; Rest = A
	-17 ¹	9			1	8	80	110	250	280	o	A = D; Rest = A
	-18	8				8	80	110	250	280	x	A, B, F, G, H = D Rest = A
	-19	14				14	80	110	250	280	x	A
	-21	3	1			2	80	110	250	280	x	A
-22	4		4			-	110	250	-	o	A	
-23	8			8		-	-	-	-	x	H = D; Rest = A	
-28 ¹	7			7		80	-	-	280	o	A	
24	-2	7			7		80			280	x	D
	-A4	4		4			-	-	-	-	o	ABB1000V
	-5	16				16	80	110	250	280	x	A
	-6 ¹	8			8		80	110	250	280	o	A, G, H = D Rest = A
	-07	7			7		80	-	-	280	o	SEV 130V / D
	-7 ¹	16			2	14	80	110	250	280	o	A
	-9	2		2			35	110	250	325	x	A
	-10	7		7			80	-	-	280	o	A
	-11	9		3	6		35	110	250	325	o	A
	-12	5		2	3		80	110	250	280	o	A
	-19	12				12	-	-	-	-	o	A
-20	11			2	9	80	110	250	280	x	D	
-21 ¹	10		1		9	80	110	250	280	o	D	
-22	4		4			45	110	250	-	x	D	

¹ Ask your GIMOTA-Partner regarding the availability of this insert.

x = Grommet available

o = for grommet ask GIMOTA

Layout of inserts	Contacts total	Size of contacts				Coding				Grommet	Voltage-class			
		0, 0*	4	8H	12	16	W	X	Y			Z		
24	-A25	25				25	80	110	250	280	x	INST		
	-27	7				7	80	-	-	280	x	E		
	-28	24				24	80	110	250	280	x	INST		
	-A28	28				28	65	146	235	-	x	INST		
28	-1	9			3	6	80	110	250	280	x	A, J, E = D Rest = A		
	-2	14				2	12	35	110	250	325	o	D	
	-3	3			3		70	145	215	290	o	E		
	-5	5		2		1	2	35	110	250	325	o	D	
	-6	3		3			70	145	215	290	o	D		
	-9 ¹	12				6	6	80	110	250	280	o	D	
	-10	7		2	2	3		80	110	250	280	o	G = D; Rest = A	
	-11	22				4	18	80	110	250	280	x	A	
	-12	26					26	90	180	270	-	x	A	
	-15	35					35	80	110	250	280	x	A	
	-16	20					20	80	110	250	280	x	A	
	-17 ¹	15					15	80	110	250	280	o	M, N, P = D R = B; Rest = A	
	-18 ¹	12					12	70	145	215	290	o	M = C; A, B = A G, H, J, K, L = D Rest = A	
	-19 ¹	10					4	6	80	110	250	280	o	H, M = B A, B = D Rest = A
	-20	14				10	4	80	110	250	280	o	A	
	-21	37					37	80	110	250	280	x	A	
	-22	6		3			3	70	145	215	290	o	D	
	-51	12				12		80	135	195	-	x	D	
	32	-1	5	2			3	80	110	250	280	x	A = E; Rest = D	
		-2 ¹	5		3		2	70	145	215	290	o	E	
-5		2	2				35	110	250	325	x	D		
-6 ¹		23		2	3	2	16	80	110	250	280	o	A	
-7 ¹		35				7	28	80	125	235	280	o	A, B, h, j = INST Rest = A	
-8		30				6	24	80	125	235	280	o	A	
-A9		9		3		6	-	-	-	-	o	A		
-013		13				13		65	130	230	295	x	SEV 250V / D	
-13 ¹		23				5	18	80	110	250	280	o	D	
-15		8	2			6		35	110	250	280	o	D	
-17		4		4				45	110	250	-	x	D	
-22		54					54	80	110	250	280	x	A	
-A30		30				10	20	-	-	-	-	x	A	
-31		31					31	-	-	-	-	x	SEV 130V / A	
-A55	55					55	80	110	250	280	o	A		
-59	42			2		40	-	-	-	-	x	A		
36	-3	6	3			3	70	145	215	290	o	D		
	-5	4	4				-	120	240	-	o	A		
	-6 ¹	6	2	4			35	110	250	325	o	A		
	-7	47				7	40	80	110	250	280	x	A	

¹ Ask your GIMOTA-Partner regarding the availability of this insert.

x = Grommet available

o = for grommet ask GIMOTA

Layout of inserts		Contacts total	Size of contacts				Coding				Grommet	Voltage-class	
			0, 0*	4	8H	12	16	W	X	Y			Z
36	-8 ¹	47				1	46	80	110	250	280	o	A
	-9 ¹	31		1	2	14	14	80	125	235	280	o	A
	-10	48					48	80	125	235	280	x	A
	-15	35					35	60	125	245	305	x	M = D; Rest = A
	-A22	22				22		80	110	250	280	x	D
40	-A3	3		3				-	-	-	-	o	ABB 3000V
	-A4	4	4					-	-	-	-	o	ABB 750V/E
	-A8	8	4				4	35	110	250	325	x	E
	-9	47			1	22	24	65	125	225	310	o	A
	-10 ¹	29		4	9		16	65	125	225	310	o	A
	-A10	8		4			4	60	125	225	310	x	D
	-A14	14		8			6	80	135	195	-	x	A
	-A16	16			16			-	-	-	-	o	ABB 1000V
	-A20	20			2	18		80	110	250	280	x	A
	-A25	25		1		24		50	130	260	280	x	A
	-31	31				31		80	110	250	280	o	D
	-35	35				35		70	145	215	290	x	SEV 130V / D
	-B37	37				37		30	135	-	-	o	A
	-A47	47			1	22	24	65	125	225	310	o	A
	-56	85					85	72	114	216	288	x	A
-A60	60					60	80	-	-	280	x	A	
-A62	62			2		60	80	130	230	280	o	A	
-63	61					61	80	-	-	280	x	SEV 130V / A	

¹ Ask your GIMOTA-Partner regarding the availability of this insert.

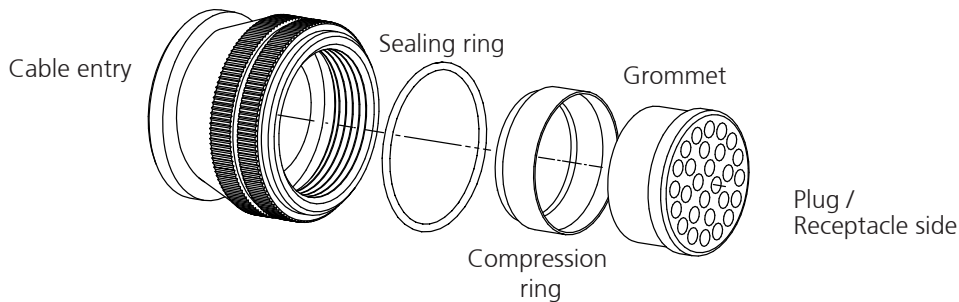
x = Grommet available

o = for grommet ask GIMOTA

2.3.6 Environmental seals / wire support (Grommet)

Grommet environmental seals have originally been designed to support soldered wire adaptations to the contacts in order to improve the endurance of the assembly under vibrations. Generally grommets can also offer an increased sealing along the wires inside the connector. Crimped contacts don't require a grommet for increased endurance under vibration. Available grommets for the concerning contact layouts are indicated under chapter 2.3.3 and 2.3.5.

Example of using a Grommet as an Environmental Seal



Application

Grommets are sitting inside the backshells. The applied compression ring compresses the grommet during tightening the backshell to the plug/receptacle. The grommet deforms and seals and support the installed wires accordingly. The compression ring also avoid increasing friction (gliding ring) if tightening the backshell onto the plug/receptacle that may cause distortion of the elastomeric grommet.

For 90° elbow backshells the compression ring is not required for all sizes (due to swivelling nut application).

Material

Grommet: according to the contact insert material of the plug/receptacle part
 Compression ring: Thermoplastic (PA)

Item no.: BGxx-xxx-m

xx-xxx is to be replaced by the layout code of the plug/receptacle part
m is to be replaced by the concerning material code
 (E: Ethylen Acrylate GXF, C: Chloroprene CR)

Ordering example:

BG20-11-E for plug/receptacle size 20 with layout 20-11, material is Ethylene Acrylate GXF

Compression Ring

Compression rings are generally required for all backshells without swivel nut.

For 90° elbow back shells, compression rings are required as mentioned in the table below:

Größe	10SL	14S	16S	16	18	20	22	24	28	32	36	40
Compression ring required	yes	no	yes	yes	yes	no	no	yes	no	yes	yes	yes

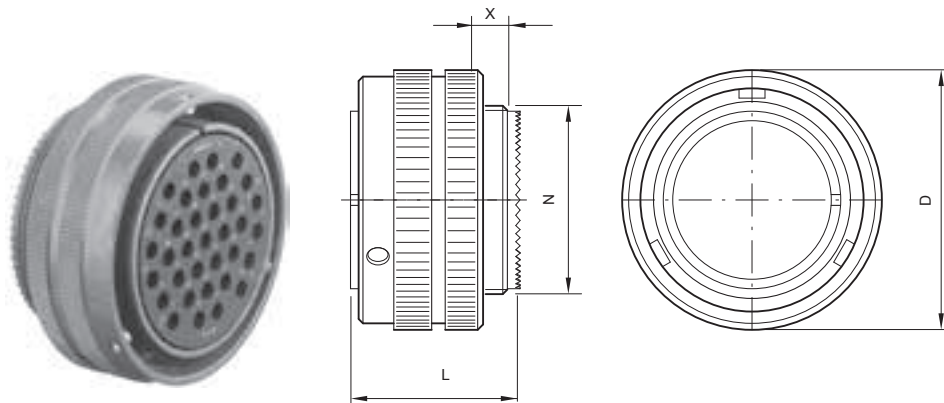
3 Plugs

3.1 Plug parts indoor

3.1.1 Series **GB**, **GR** and **GS**

Picture: Plug GB60/GR60/GS60

Shell type: 60
Shell type for EMI: 601



EMI
Material
Insert
Item No.

360° shield contact ensured by grounding fingers as per chapter 2.2.4
refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according numbering key, chapter 2.3.2

Size	D max.	N Thread (Inches)	L max.	x
10SL	23.0	$\frac{5}{8}$ "-24 UNEF 2A	24.6	9.0
14SL	30.0	$\frac{3}{4}$ "-20 UNEF 2A	24.6	9.0
16	32.0	$\frac{7}{8}$ "-20 UNEF 2A	34.1	9.0
16S	32.0	$\frac{7}{8}$ "-20 UNEF 2A	24.6	9.0
18	37.0	1"-20 UNEF 2A	36.0	9.0
20	40.0	1 $\frac{1}{8}$ "-18 UNEF 2A	36.0	9.0
22	44.0	1 $\frac{1}{4}$ "-18 UNEF 2A	36.0	9.0
24	48.0	1 $\frac{3}{8}$ "-18 UNEF 2A	36.0	9.0
28	54.0	1 $\frac{5}{8}$ "-18 UNEF 2A	36.0	9.0
32	60.0	1 $\frac{7}{8}$ "-16 UN 2A	38.0	10.5
36	67.0	2 $\frac{1}{16}$ "-16 UN 2A	38.5	11.3
40	73.0	2 $\frac{5}{16}$ "-16 UN 2A	38.5	11.3

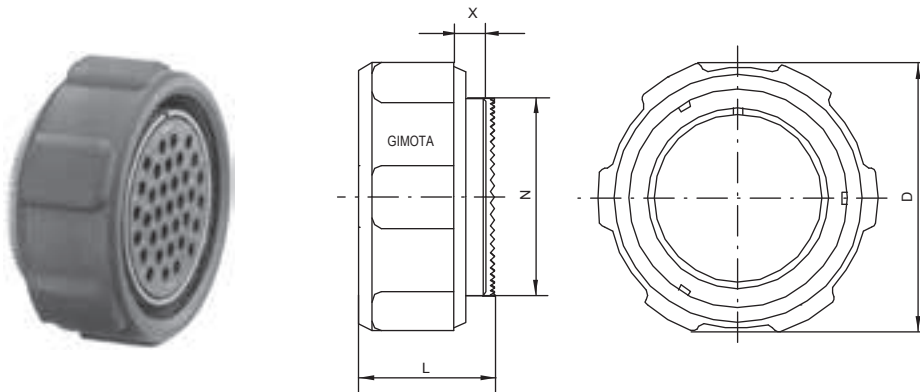
x indicates the overlap of applied back-/endshell

3.2 Plug parts outdoor

3.2.1 Series **GB**

Picture: Plug GB603

Shell type: 603
Shell type for EMI: 605



EMI
Material
Insert
Item No.

360° shield contactation ensured by grounding fingers as per chapter 2.2.4
refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according numbering key, chapter 2.3.2

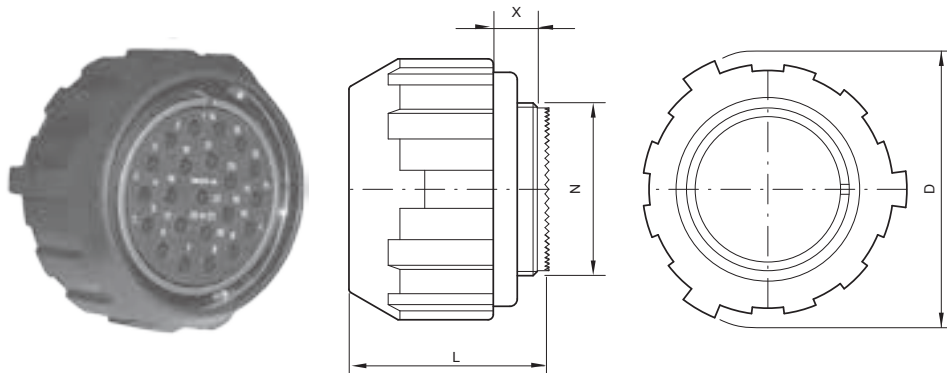
Size	D max.	N Thread (Inches)	L max.	x
18	48.0	1"-20 UNEF 2A	36.0	9.0
24	58.0	1 ³ / ₈ "-18 UNEF 2A	36.0	9.0
32	76.0	1 ⁷ / ₈ "-16 UN 2A	38.0	10.5
36	78.3	2 ¹ / ₁₆ "-18 UN 2A	38.5	11.3
40	84.0	2 ⁵ / ₁₆ "-16 UN 2A	38.5	11.3

x indicates the overlap of applied back-/endshell

3.2.2 Series **GR** or **GS**

Picture: Plug GR602/GS602

Shell type: 602
Shell type for EMI: 604



EMI
Material
Insert
Item No.

360° shield contactn ensured by grounding fingers as per chapter 2.2.4
refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according numbering key, chapter 2.3.2

Size	D max.	N Thread (inches)	L max.	x
14S	40.2	$\frac{3}{4}$ "-20 UNEF 2A	28.0	9.0
18	49.0	1"-20 UNEF 2A	39.0	9.0
20	51.5	$1\frac{1}{8}$ "-18 UNEF 2A	39.0	9.0
22	56.0	$1\frac{1}{4}$ "-18 UNEF 2A	39.0	9.0
24	60.0	$1\frac{3}{8}$ "-18 UNEF 2A	39.0	9.0
28	67.0	$1\frac{5}{8}$ "-18 UNEF 2A	39.0	9.0
32	76.0	$1\frac{7}{8}$ "-16 UN 2A	41.0	10.5
36	82.0	$2\frac{1}{16}$ "-18 UN 2A	41.0	11.3
40	88.0	$2\frac{5}{16}$ "-16 UN 2A	42.0	11.3

x indicates the overlap of applied back-/endshell

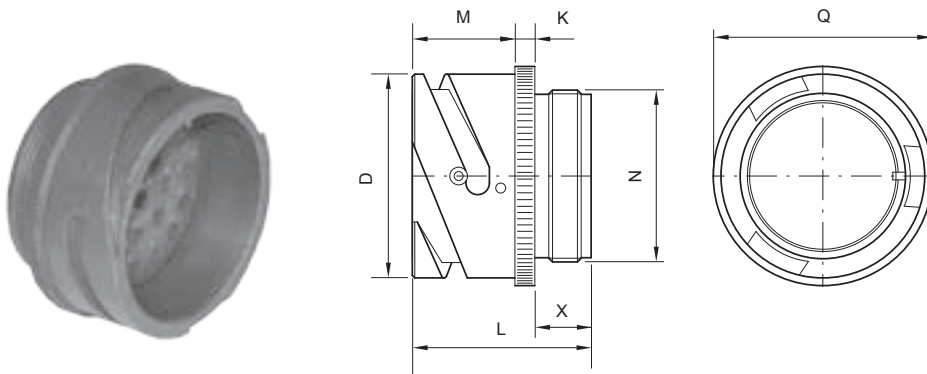
4 Receptacles

4.1 Inline receptacle parts, indoor and outdoor

Series **GB, GR** or **GS**

Picture: Receptacle GB11

Shell type: 11



Material
Insert
Item No.

refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according to numbering key, chapter 2.3.2

Size	D	N Thread (inches)	Q max	L	M	K	x
10SL	18.2	$\frac{5}{8}$ "-24 UNEF 2A	22.0	25.0	14.2	2.8	9.0
14S	24.6	$\frac{3}{4}$ "-20 UNEF 2A	29.0	25.0	14.2	3.2	9.0
16S	27.4	$\frac{7}{8}$ "-20 UNEF 2A	31.0	25.0	14.2	3.2	9.0
16	27.4	$\frac{7}{8}$ "-20 UNEF 2A	31.0	34.0	19.0	3.2	9.0
18	30.8	1"-20 UNEF 2A	34.0	34.3	19.0	4.0	9.0
20	34.2	1 $\frac{1}{8}$ "-18 UNEF 2A	37.0	34.3	19.0	4.0	9.0
22	37.4	1 $\frac{1}{4}$ "-18 UNEF 2A	40.0	34.3	19.0	4.0	9.0
24	40.9	1 $\frac{3}{8}$ "-18 UNEF 2A	44.0	36.0	20.6	4.0	9.0
28	46.7	1 $\frac{5}{8}$ "-18 UNEF 2A	49.5	36.0	20.6	4.0	9.0
32	53.4	1 $\frac{7}{8}$ "-16 UN 2A	56.0	37.5	22.2	4.0	10.5
36	59.6	2 $\frac{1}{16}$ "-16 UN 2A	62.5	37.5	22.2	4.0	11.3
40	66.0*	2 $\frac{5}{16}$ "-16 UN 2A	68.5	37.5	22.2	4.0	11.3

* GR and GS = 65.5

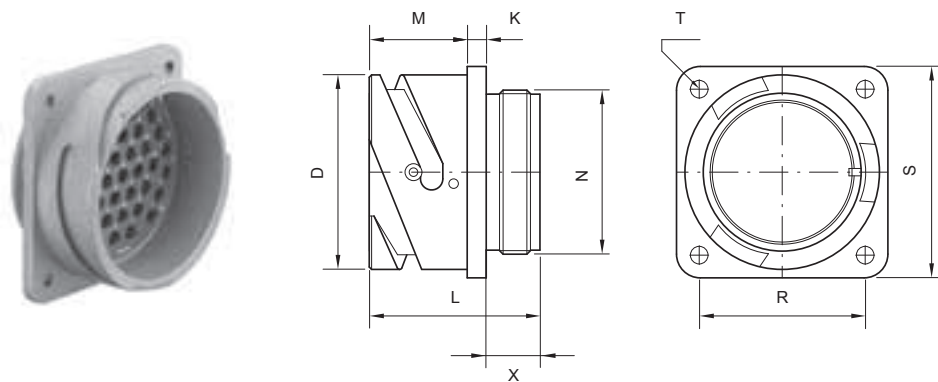
x represents the overlap with screweed or back-/endshell

4.2 Receptacle parts with flange, indoor and outdoor

Series **GB, GR** or **GS**
front panel mount

Picture: Receptacle GB21

Shell types: 20, 21



Material
Insert
Item No.

refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according numbering key, chapter 2.3.2

Size	S	R	T	D	N	N	L	M	K	x
					Thread (inches)	max				
10SL	25.4	18.2	Fastening holes see 2.2.5	18.2	$\frac{5}{8}$ "-24 UNEF 2A	16.1	25.0	14.2	2.8	9.0
14S	30.2	23.0		24.6	$\frac{3}{4}$ "-20 UNEF 2A	19.2	25.0	14.2	3.2	9.0
16S	32.5	24.6		27.4	$\frac{7}{8}$ "-20 UNEF 2A	22.4	25.0	14.2	3.2	9.0
16	32.5	24.6		27.4	$\frac{7}{8}$ "-20 UNEF 2A	22.4	34.0	19.0	3.2	9.0
18	34.9	27.0		30.8	1"-20 UNEF 2A	25.6	34.3	19.0	4.0	9.0
20	38.1	29.4		34.2	$1\frac{1}{8}$ "-18 UNEF 2A	28.8	34.3	19.0	4.0	9.0
22	41.0	31.8		37.4	$1\frac{1}{4}$ "-18 UNEF 2A	32.2	34.3	19.0	4.0	9.0
24	44.5	34.9		40.9	$1\frac{3}{8}$ "-18 UNEF 2A	35.2	36.0	20.6	4.0	9.0
28	50.8	39.7		46.7	$1\frac{5}{8}$ "-18 UNEF 2A	41.5	36.0	20.6	4.0	9.0
32	57.0	44.5		53.4	$1\frac{7}{8}$ "-16 UN 2A	47.8	37.5	22.2	4.0	10.5
36	63.5	49.2		59.6	$2\frac{1}{16}$ "-16 UN 2A	52.6	37.5	22.2	4.0	11.3
40	69.8	55.6		66.0*	$2\frac{5}{16}$ "-16 UN 2A	59.2	37.5	22.2	4.0	11.3

* GR and GS = 65.5

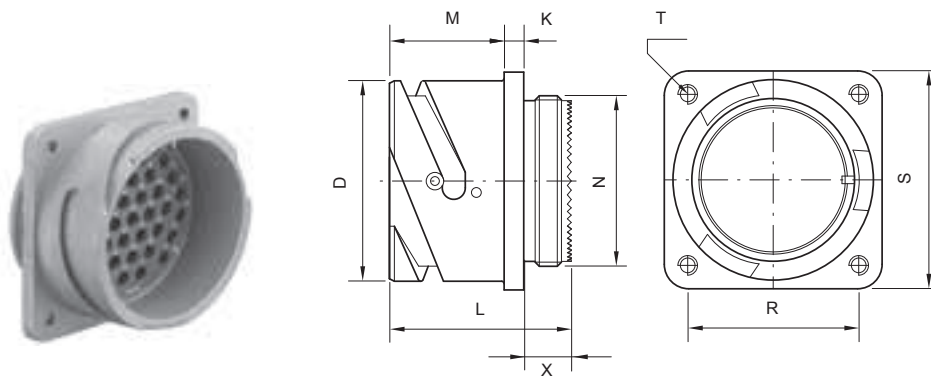
x indicates the overlap of applied back-/endshell

4.3 Receptacle parts with flange, indoor and outdoor

Series **GB, GR** or **GS**
rear panel mount

Picture: Receptacle GB32

Shell types: 30, 32



Material
Insert
Item No.

refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according numbering key, chapter 2.3.2

Size	S	R	T	D	N	N max	L	M	K	x
10SL	25.4	18.2	Fastening holes see 2.2.5	18.2	$\frac{5}{8}$ "-24 UNEF 2A	16.1	30.0	18.2	2.8	9.0
14S	30.2	23.0		24.6	$\frac{3}{4}$ "-20 UNEF 2A	19.2	30.0	18.2	3.2	9.0
16S	32.5	24.6		27.4	$\frac{7}{8}$ "-20 UNEF 2A	22.4	30.0	18.2	3.2	9.0
16	32.5	24.6		27.4	$\frac{7}{8}$ "-20 UNEF 2A	22.4	38.8	23.1	3.2	9.0
18	34.9	27.0		30.8	1"-20 UNEF 2A	25.6	38.8	23.1	4.0	9.0
20	38.1	29.4		34.2	1 $\frac{1}{8}$ "-18 UNEF 2A	28.8	38.8	23.1	4.0	9.0
22	41.0	31.8		37.4	1 $\frac{1}{4}$ "-18 UNEF 2A	32.2	38.8	23.1	4.0	9.0
24	44.5	34.9		40.9	1 $\frac{3}{8}$ "-18 UNEF 2A	35.2	38.8	23.1	4.0	9.0
28	50.8	39.7		46.7	1 $\frac{5}{8}$ "-18 UNEF 2A	41.5	39.1	24.1	4.0	9.0
32	57.0	44.5		53.4	1 $\frac{7}{8}$ "-16 UN 2A	47.8	39.5	24.1	4.0	10.5
36	63.5	49.2		59.6	2 $\frac{1}{16}$ "-16 UN 2A	52.6	39.5	24.1	4.0	11.3
40	69.8	55.6		66.0*	2 $\frac{5}{16}$ "-16 UN 2A	59.2	39.5	24.1	4.0	11.3

* GR and GS = 65.5

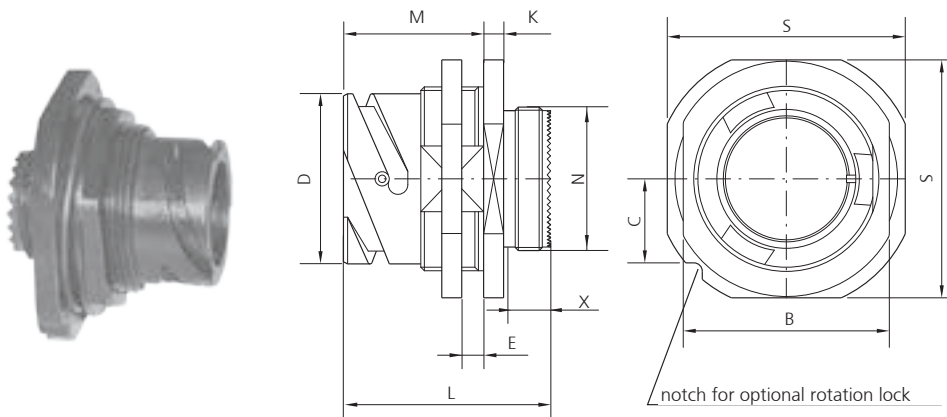
x indicates the overlap of applied back-/endshell

4.4 Jam nut receptacle parts, indoor and outdoor / accessories thread

Series **GB, GR** or **GS**

Picture: Receptacle GB72

Shell types: 72



Material
Insert
Item No.

refer to chapter 2.2.2
refer to list 2.3.3 / 2.3.5
according numbering key, chapter 2.3.2

Size	S	B	C	D	N Thread (inches)	E Panel thickness		L	M	K	x
						min	max				
10SL	31.8	27.0	11.2	18.2	$\frac{5}{8}$ "-24 UNEF 2A	2.4	5.2	36.2	24.5	4.0	9.0
14S	41.3	33.0	14.6	24.6	$\frac{3}{4}$ "-20 UNEF 2A	2.4	7.5	39.8	26.8	4.8	9.0
16S	44.4	38.1	15.7	27.4	$\frac{7}{8}$ "-20 UNEF 2A	2.4	7.5	40.1	26.8	4.8	9.0
16	44.4	38.1	15.7	27.4	$\frac{7}{8}$ "-20 UNEF 2A	2.4	7.5	48.9	32.1	4.8	9.0
18	47.6	39.7	16.8	30.8	1"-20 UNEF 2A	2.4	9.0	49.3	33.7	4.8	9.0
20	50.8	44.0	18.0	34.2	$1\frac{1}{8}$ "-18 UNEF 2A	2.4	9.0	50.2	33.7	4.8	9.0
22	54.2	46.0	20.2	37.4	$1\frac{1}{4}$ "-18 UNEF 2A	2.4	9.1	50.5	33.7	4.8	9.0
24	57.2	50.8	20.2	40.9	$1\frac{3}{8}$ "-18 UNEF 2A	2.4	9.1	50.5	33.7	4.8	9.0
28	63.5	55.0	22.5	46.7	$1\frac{5}{8}$ "-18 UNEF 2A	2.4	8.5	51.9	35.2	5.6	9.0
32	69.8	62.0	24.7	53.4	$1\frac{7}{8}$ "-16 UN 2A	2.4	6.5	51.9	35.2	5.6	10.5
36	76.2	71.0	26.9	59.6	$2\frac{1}{16}$ "-16 UN 2A	2.4	8.3	51.9	35.2	5.6	11.3
40	83.5	75.0	29.6	66.0*	$2\frac{5}{16}$ "-16 UN 2A	2.4	8.3	51.9	35.2	5.6	11.3

* GR and GS = 65.5

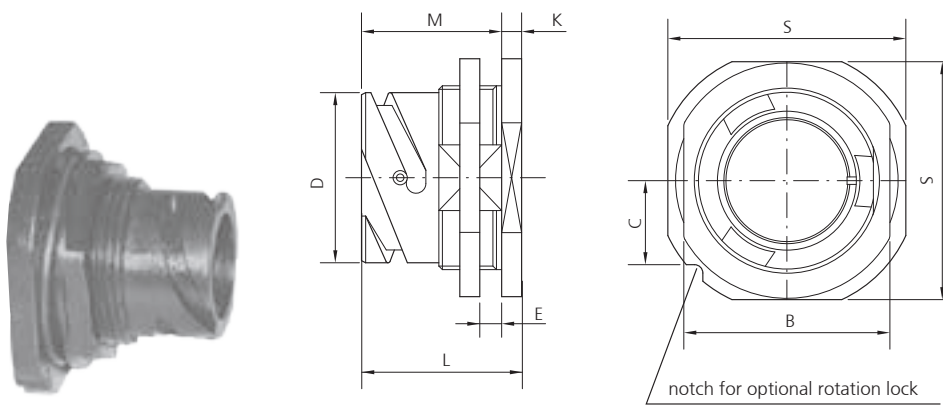
x indicates the overlap of applied back-/endshell

4.5 Jam nut receptacle parts, indoor and outdoor, without accessories thread

Series **GB, GR** or **GS**

Picture: Receptacle GB70

Shell type: 70



Material refer to chapter 2.2.2
Insert refer to list 2.3.3 / 2.3.5
Item No. according numbering key, chapter 2.3.2

Size	S	B	C	D	E		L	M	K	x
					Panel thickness min.	max.				
10SL	31.8	27.0	11.2	18.2	2.4	5.2	28.5	24.5	4.0	9.0
14S	41.3	33.0	14.6	24.6	2.4	7.5	31.6	26.8	4.8	9.0
16S	44.4	38.1	15.7	27.4	2.4	7.5	31.6	26.8	4.8	9.0
16	44.4	38.1	15.7	27.4	2.4	7.5	36.9	32.1	4.8	9.0
18	47.6	39.7	16.8	30.8	2.4	9.0	38.5	33.7	4.8	9.0
20	50.8	44.0	18.0	34.2	2.4	9.0	38.5	33.7	4.8	9.0
22	54.2	46.0	20.2	37.4	2.4	9.1	38.5	33.7	4.8	9.0
24	57.2	50.8	20.2	40.9	2.4	9.1	38.5	33.7	4.8	9.0
28	63.5	55.0	22.5	46.7	2.4	8.5	40.8	35.2	5.6	9.0
32	69.8	62.0	24.7	53.4	2.4	6.5	40.8	35.2	5.6	10.5
36	76.2	71.0	26.9	59.6	2.4	8.3	40.8	35.2	5.6	11.3
40	83.5	75.0	29.6	66.0*	2.4	8.3	40.8	35.2	5.6	11.3

* GR and GS = 65.5

x indicates the overlap of applied back-/endshell

5 Components and accessories

5.1 Contacts, Filler Plugs

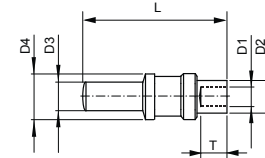
5.1.1 Contacts

The given cross sections and AWG sizes are reference values and based on market available wires and conductors that have been pressed with GIMOTA-crimping tools. Individual qualification testing by the user is recommended.

Material

Pin contacts

Material of contacts: Cu-Alloy
Surface of contacts: silver plated/min. 3,5 µm
Electrical properties see chapter 2.2.1

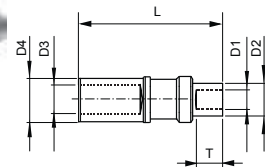


Contact size	Conductor mm ²	Conductor AWG	strip-ping	D1	D2	D3	D4	T	L	Item number
0	16	-	17.0	6.2	9.3	9.0	15.0	17.0	51.0	10-660-0-162G62
0	25	-	18.0	7.6	11.7	9.0	15.0	17.0	52.0	10-660-0-252G76
0	25	2-1 ¹	18.0	8.9	13.0	9.0	15.0	17.0	53.0	10-660-0-352G89
0	50	00	22.0	10.5	14.6	9.0	15.0	20.5	56.0	10-660-0-502G10
4	6	8	9.0	3.6	5.2	5.7	11.0	8.5	41.0	10-660-4-6G10
4	10	6	13.0	4.6	6.5	5.7	11.0	12.2	41.0	10-660-4-10G10
4	16	4-3 ¹	13.0	7.0	9.3	5.7	11.0	12.2	41.0	10-660-4-16G10
4	16	-	13.0	6.2	9.3	5.7	11.0	12.2	41.0	10-660-4-16G62

Material

Socket contacts

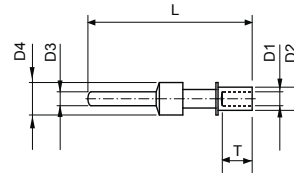
Material of contacts: Cu-Alloy
Surface of contacts: silver plated/min. 3,5 µm
Electrical properties see chapter 2.2.1



Contact size	Conductor mm ²	Conductor AWG	strip-ping	D1	D2	D3	D4	T	L	Item number
0*	16	4-3 ¹	17.0	7.0	9.3	9.0	15.0	16.0	50.0	10-905-0-162G10
0*	16	-	17.0	6.2	9.3	9.0	15.0	16.0	50.0	10-905-0-162G62
0*	25	2-1 ¹	18.0	8.9	11.7	9.0	15.0	17.0	51.0	10-905-0-252G10
0*	25	-	18.0	7.6	11.7	9.0	15.0	17.0	51.0	10-905-0-252G76
0*	35	0	19.0	10.0	13.0	9.0	15.0	18.0	52.0	10-905-0-352G10
0*	50	00	22.0	10.5	14.6	9.0	15.0	20.5	55.0	10-905-0-502G10
0	16	-	17.0	6.2	9.3	9.0	15.0	16.0	48.0	10-903-0-162G62
0	25	-	18.0	7.6	11.7	9.0	15.0	17.0	49.0	10-903-0-252G76
0	35	0	19.0	8.9	13.0	9.0	15.0	18.0	52.0	10-903-0-352G89
0	50	00	22.0	10.5	14.6	9.0	15.0	20.5	53.0	10-903-0-502G10
4	6	8	9.0	3.6	5.2	5.7	11.0	8.5	41.0	10-903-4-6G10
4	10	6	13.0	4.6	6.5	5.7	11.0	12.2	41.0	10-903-4-10G10
4	16	4-3 ¹	13.0	7.0	9.3	5.7	11.0	12.2	41.0	10-903-4-16G10
4	16	-	13.0	6.2	9.3	5.7	11.0	12.2	41.0	10-903-4-16G62

0* "Lamella-contacts" for higher current

¹ Depending on the conductor

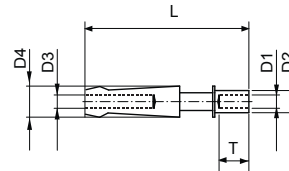
**Material****Pin contacts**

Material of contacts: Cu-Alloy

Surface of contacts: silver plated/min. 3,5 µm

Electrical properties see chapter 2.2.1

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG								
8H	1.5	16	9.0	1.75	4.00	3.6	7.8	8.5	41.0	10-40794-18 AG
8H	2.5	12	9.0	2.30	4.00	3.6	7.8	8.5	41.0	10-40794-22 AG
8H	6	10	9.0	3.55	5.00	3.6	7.8	8.5	41.0	10-40794-38 AG
8H	10	6	13.0	4.60	6.35	3.6	7.8	12.2	41.0	10-40794-50 AG

**Material****Socket contacts**

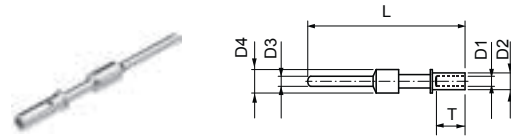
Material of contacts: Cu-Alloy

Surface of contacts: silver plated/min. 3,5 µm

Electrical properties see chapter 2.2.1

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG								
8H	1.5	16	9.0	1.75	4.00	3.6	7.8	8.5	38.0	10-40796-18 AG
8H	2.5	12/14	9.0	2.30	4.00	3.6	7.8	8.5	38.0	10-40796-22 AG
8H	6	10	9.0	3.55	5.00	3.6	7.8	8.5	38.0	10-40796-38 AG
8H	10	6/8	13.0	4.60	6.35	3.6	7.8	12.2	38.0	10-40796-50 AG

8H "Lamella-contacts" for higher current


Material
Pin contacts

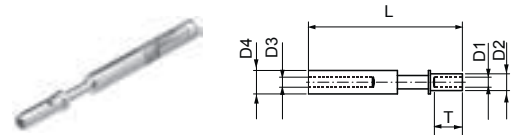
Material of contacts: Cu-Alloy

 Surface of contacts*: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni

AG = silver plated: min. 3,5 µm

Electrical properties see chapter 2.2.1

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG								
12	0.5	22-20	9.0	1.10	3.00	2.4	4.8	8.5	38.0	10-40561-11 AU*
12	0.75-1.0	22-18	9.0	1.45	3.35	2.4	4.8	8.5	38.0	10-40561-15 AU*
12	1.5	18-16	9.0	1.75	3.95	2.4	4.8	8.5	38.0	10-40561-18 AU*
12	2.5	14	9.0	2.25	3.95	2.4	4.8	8.5	38.0	10-40561-22 AU*
12	4	12-10	9.0	2.95	4.75	2.4	4.8	8.5	38.0	10-40561-30 AU*
12	6	10	9.0	3.50	4.75	2.4	4.8	8.5	38.0	10-40561-38 AU*
16	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	32.0	10-40557-05 AU*
16	0.75	18	7.0	1.35	2.20	1.6	3.1	6.4	32.0	10-40557-075 AU*
16	1.0	16	7.0	1.75	2.62	1.6	3.1	6.4	32.0	10-40557 AU*
16	1.5	-	7.0	1.80	2.90	1.6	3.1	6.4	32.0	10-40557-20-1 AU*
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40553-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40553 AU

 * To order silver plated contacts, replace **AU** with **AG**

Material
Socket contacts

Material of contacts: Cu-Alloy

 Surface of contacts*: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni

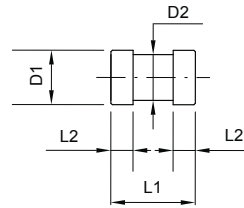
AG = silver plated: min. 3,5 µm

Electrical properties see chapter 2.2.1

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG								
12	0.5	22-20	9.0	1.10	3.00	2.4	4.8	8.5	38.0	10-40560-11 AU*
12	0.75-1.0	22-18	9.0	1.45	3.35	2.4	4.8	8.5	38.0	10-40560-15 AU*
12	1.5	18-16	9.0	1.75	3.95	2.4	4.8	8.5	38.0	10-40560-18 AU*
12	2.5	14	9.0	2.25	3.95	2.4	4.8	8.5	38.0	10-40560-22 AU*
12	4	12-10	9.0	2.95	4.75	2.4	4.8	8.5	38.0	10-40560-30 AU*
12	6	10	9.0	3.50	4.75	2.4	4.8	8.5	38.0	10-40560-38 AU*
16	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	37.0	10-40556-05 AU*
16	0.75	18	7.0	1.35	2.20	1.6	3.1	6.4	37.0	10-40556-075 AU*
16	1.0	16	7.0	1.75	2.62	1.6	3.1	6.4	37.0	10-40556 AU*
16	1.5	-	7.0	1.80	2.90	1.6	3.1	6.4	37.0	10-40556-20-1 AU*
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40552-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40552 AU

 * To order silver plated contacts, replace **AU** with **AG**

5.1.2 Filler Plugs



To use with inserts:

Material Polyamide

Size	L1	L2	D1	D2	Item number
0	14.3	4.3	15.00	13.50	10-101033-0
4	11.8	3.1	11.00	9.80	10-101033-4
8	11.9	3.1	7.40	6.30	10-101033-141
12	12.0	3.2	4.60	3.70	10-101033-131
16/16S	12.0	3.2	3.00	1.80	10-101033-121

To use with grommets:

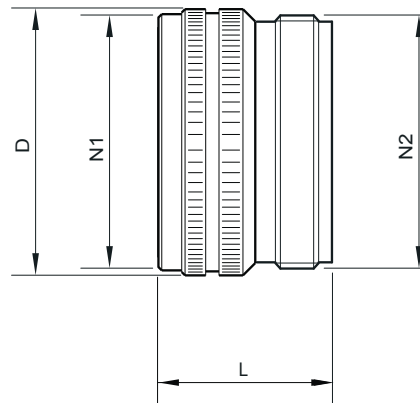
Material Polyamid

Size	L1	L2	D1	D2	Item number
0	11.9	3.2	13.50	12.80	10-101034-0
4	11.9	3.2	8.50	7.60	10-101034-4
8	11.9	3.2	5.8	3.2	10-101034-141
12	12.0	3.2	4.60	3.70	10-101034-131
16/16S	15.8	10.8	3.7	2.6	10-101034-121

5.2 Back shells

5.2.1 Standard back shells

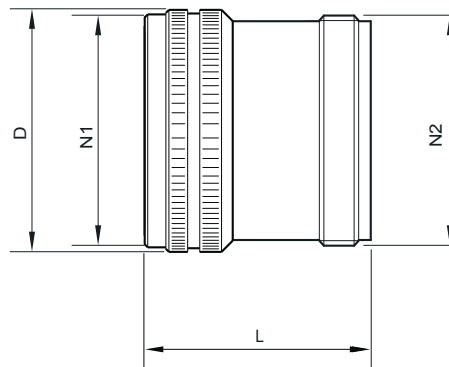
Back shell straight, normal



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductiv [AA]
 Other material / surface: see chapter 2.2.2 / on request

Size	D	N1 Thread (inches)	N2 Thread (inches)	L	Item number	
10	20	5/8"-24 UNEF 2B	5/8"-24 UNEF 2A	18	BSN10-AC	BSN10-AA
14	24	3/4"-20 UNEF 2B	3/4"-20 UNEF 2A	20	BSN14-AC	BSN14-AA
16	27	7/8"-20 UNEF 2B	7/8"-20 UNEF 2A	27	BSN16-AC	BSN16-AA
18	30	1"-20 UNEF 2B	1"-20 UNEF 2A	28	BSN18-AC	BSN18-AA
20	32	1 1/8"-18 UNEF 2B	1 3/16"-18 UNEF 2A	28	BSN20-AC	BSN20-AA
22	37	1 1/4"-18 UNEF 2B	1 3/16"-18 UNEF 2A	31	BSN22-AC	BSN22-AA
24	40	1 3/8"-18 UNEF 2B	1 7/16"-18 UNEF 2A	31	BSN24-AC	BSN24-AA
28	45	1 5/8"-18 UNEF 2B	1 7/16"-18 UNEF 2A	39	BSN28-AC	BSN28-AA
32	52	1 7/8"-16 UN 2B	1 3/4"-18 UNS 2A	40	BSN32-AC	BSN32-AA
36	58	2 1/16"-16 UN 2B	2"-18 UNS 2A	40	BSN36-AC	BSN36-AA
40	64	2 5/16"-16 UN 2B	2 1/4"-16 UN 2A	40	BSN40-AC	BSN40-AA

Back shell straight, long

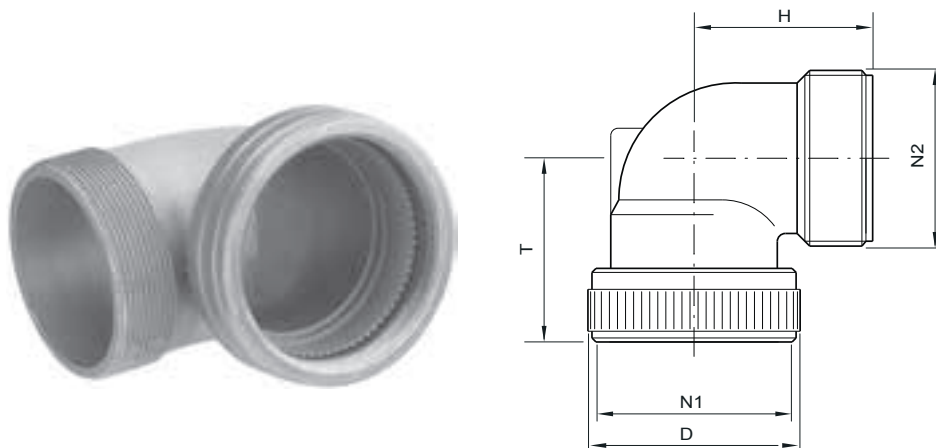


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductiv [AA]
 Other material / surface: see chapter 2.2.2 / on request

Size	D	N1 Thread (inches)	N2 Thread (inches)	L	Item number	
10	20	5/8" -24 UNEF 2B	5/8" -24 UNEF 2A	37	BSL10-AC	BSL10-AA
14	24	3/4" -20 UNEF 2B	3/4" -20 UNEF 2A	37	BSL14-AC	BSL14-AA
16	27	7/8" -20 UNEF 2B	7/8" -20 UNEF 2A	40	BSL16-AC	BSL16-AA
18	30	1" -20 UNEF 2B	1" -20 UNEF 2A	41	BSL18-AC	BSL18-AA
20	32	1 1/8" -18 UNEF 2B	1 3/16" -18 UNEF 2A	42	BSL20-AC	BSL20-AA
22	37	1 1/4" -18 UNEF 2B	1 3/16" -18 UNEF 2A	43	BSL22-AC	BSL22-AA
24	40	1 3/8" -18 UNEF 2B	1 7/16" -18 UNEF 2A	45	BSL24-AC	BSL24-AA
28	45	1 5/8" -18 UNEF 2B	1 7/16" -18 UNEF 2A	45	BSL28-AC	BSL28-AA
32	52	1 7/8" -16 UN 2B	1 3/4" -18 UNS 2A	65	BSL32-AC	BSL32-AA
36	58	2 1/16" -16 UN 2B	2" -18 UNS 2A	65	BSL36-AC	BSL36-AA
40	64	2 5/16" -16 UN 2B	2 1/4" -16 UN 2A	65	BSL40-AC	BSL40-AA

90°- elbow back shell

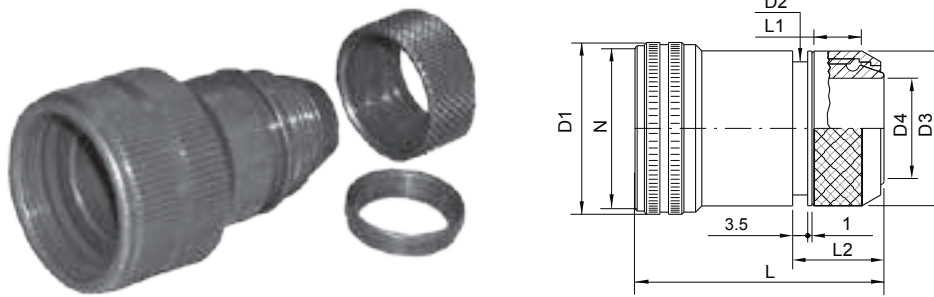
With swivel nut for individual positioning of wire/cable outlet direction.



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductive [AA]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	D	N1 Thread (inches)	N2 Thread (inches)	H	T	Item number	
10	20	$\frac{5}{8}$ "-20 UNEF 2B	$\frac{5}{8}$ "-20 UNEF 2A	26	27.5	BEN10-AC	BEN10-AA
14	24	$\frac{3}{4}$ "-20 UNEF 2B	$\frac{3}{4}$ "-20 UNEF 2A	27	29.9	BEN14-AC	BEN14-AA
16	27	$\frac{7}{8}$ "-20 UNEF 2B	$\frac{7}{8}$ "-20 UNEF 2A	29	31.4	BEN16-AC	BEN16-AA
18	30	1"-20 UNEF 2B	1"-20 UNEF 2A	31	30.5	BEN18-AC	BEN18-AA
20	32	1 $\frac{1}{8}$ "-18 UNEF 2B	1 $\frac{3}{16}$ "-18 UNEF 2A	33	33.0	BEN20-AC	BEN20-AA
22	37	1 $\frac{1}{4}$ "-18 UNEF 2B	1 $\frac{3}{16}$ "-18 UNEF 2A	35	35.5	BEN22-AC	BEN22-AA
24	40	1 $\frac{3}{8}$ "-18 UNEF 2B	1 $\frac{7}{16}$ "-18 UNEF 2A	38	38.5	BEN24-AC	BEN24-AA
28	45	1 $\frac{5}{8}$ "-18 UNEF 2B	1 $\frac{7}{16}$ "-18 UNEF 2A	40	38.5	BEN28-AC	BEN28-AA
32	52	1 $\frac{7}{8}$ "-16 UN 2B	1 $\frac{3}{4}$ "-18 UNS 2A	46	42.5	BEN32-AC	BEN32-AA
36	58	2 $\frac{1}{16}$ "-16 UN 2B	2"-18 UNS 2A	49	46.2	BEN36-AC	BEN36-AA
40	64	2 $\frac{5}{16}$ "-16 UN 2B	2 $\frac{1}{4}$ "-16 UN 2A	53	51.3	BEN40-AC	BEN40-AA

EMI - adapter with cone ring, for heatshrinkable shape

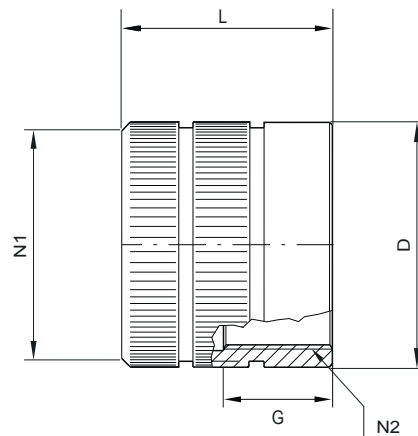


Material Standard shell material: aluminium alloy
 Standard shell surface: zinc cobalt black, conductive [AA]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	N Thread (inches)	D1	D2	D3	D4	L	L1	L2	Item number
10	$\frac{5}{8}$ "-24 UNEF 2B	20.0	16.3	18.5	8.6	53	10	18.0	ET-10-02-AA
14	$\frac{3}{4}$ "-20 UNEF 2B	24.0	16.3	18.5	8.6	53	10	18.0	ET-14-02-AA
14	$\frac{3}{4}$ "-20 UNEF 2B	24.0	20.0	22.0	10.6	53	10	18.0	ET-14-03-AA
16	$\frac{7}{8}$ "-20 UNEF 2B	27.0	23.0	25.0	13.5	54	10	20.8	ET-16-04-AA
18	1"-20 UNEF 2B	30.0	24.5	28.0	14.6	55	10	20.8	ET-18-04-AA
20	$1\frac{1}{8}$ "-18 UNEF 2B	32.0	28.5	32.0	18.5	55	10	20.8	ET-20-05-AA
22	$1\frac{1}{4}$ "-18 UNEF 2B	37.0	30.5	34.0	20.8	55	12	20.8	ET-22-06-AA
24	$1\frac{3}{8}$ "-18 UNEF 2B	40.0	34.5	38.0	24.6	58	12	20.8	ET-24-07-AA
28	$1\frac{5}{8}$ "-18 UNEF 2B	45.0	36.0	40.0	25.0	58	12	21.8	ET-28-08-AA
32	$1\frac{7}{8}$ "-16 UN 2B	52.0	44.0	48.0	33.3	60	12	20.7	ET-32-10-AA
36	$2\frac{1}{16}$ "-16 UN 2B	58.0	51.0	55.0	38.5	61	12	20.7	ET-36-12-AA
40	$2\frac{5}{16}$ "-16 UN 2B	63.8	58.0	62.0	46.0	61	12	21.8	ET-40-14-AA

5.2.2 Spezial back shell

Back shell straight, with internal PG-thread

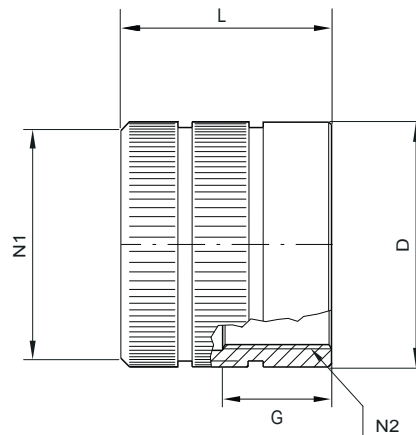


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductive [AA]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	D max.	N1 Thread (inches)	L max	N2 Thread (PG)	G	Item number	
14	24	3/4"-20 UNEF 2B	26	9	9	BSN14-P1B-AC	BSN14-P1B-AA
16	27	7/8"-20 UNEF 2B	29	13.5	10	BSN16-P3B-AC	BSN16-P3B-AA
18	30	1"-20 UNEF 2B	31	16	10	BSN18-P4B-AC	BSN18-P4B-AA
20	32	1 1/8"-18 UNEF 2B	33	16	11	BSN20-P4B-AC	BSN20-P4B-AA
22	37	1 1/4"-18 UNEF 2B	35	21	11	BSN22-P5B-AC	BSN22-P5B-AA
24	40	1 3/8"-18 UNEF 2B	38	21	11	BSN24-P5B-AC	BSN24-P5B-AA
28	45	1 5/8"-18 UNEF 2B	40	21	13	BSN28-P5B-AC	BSN28-P5B-AA
32	52	1 7/8"-16 UN 2B	46	29	13	BSN32-P6B-AC	BSN32-P6B-AA
36	58	2 1/16"-16 UN 2B	49	36	13	BSN36-P7B-AC	BSN36-P7B-AA
40	64	2 5/16"-16 UN 2B	53	36	13	BSN40-P7B-AC	BSN40-P7B-AA

Other female thread options on request

Back shell straight, with internal metric-thread

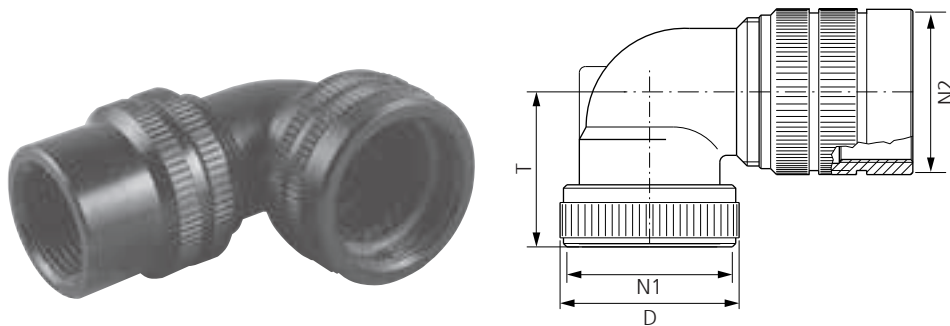


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductive [AA]
 Other material / surface: see chapter 2.2.2 / on request
 Sealing: silicone, red

Size	D max.	N1 Thread (inches)	L max	G	N2 Thread (metric)	Item number	
10	20	$\frac{5}{8}$ "-24 UNEF 2B	26	9	M 12x1.5	BSN10-M1B-AC	BSN10-M1B-AA
14	24	$\frac{3}{4}$ "-20 UNEF 2B	26	9	M 16x1.5	BSN14-M2B-AC	BSN14-M2B-AA
16	27	$\frac{7}{8}$ "-20 UNEF 2B	29	10	M 20x1.5	BSN16-M3B-AC	BSN16-M3B-AA
18	30	1"-20 UNEF 2B	31	10	M 20x1.5	BSN18-M3B-AC	BSN18-M3B-AA
20	32	1 $\frac{1}{8}$ "-18 UNEF 2B	33	11	M 25x1.5	BSN20-M4B-AC	BSN20-M4B-AA
22	37	1 $\frac{1}{4}$ "-18 UNEF 2B	35	11	M 32x1.5	BSN22-M5B-AC	BSN22-M5B-AA
24	40	1 $\frac{3}{8}$ "-18 UNEF 2B	38	11	M 32x1.5	BSN24-M5B-AC	BSN24-M5B-AA
28	45	1 $\frac{5}{8}$ "-18 UNEF 2B	40	13	M 32x1.5	BSN28-M5B-AC	BSN28-M5B-AA
32	52	1 $\frac{7}{8}$ "-16 UN 2B	46	13	M 40x1.5	BSN32-M6B-AC	BSN32-M6B-AA
36	58	2 $\frac{1}{16}$ "-UN 2B	49	13	M 50x1.5	BSN36-M7B-AC	BSN36-M7B-AA
40	64	2 $\frac{5}{16}$ "-UN 2B	53	13	M 50x1.5	BSN40-M7B-AC	BSN40-M7B-AA

Other female thread options on request

90°- elbow back shell with adapter to metric female thread

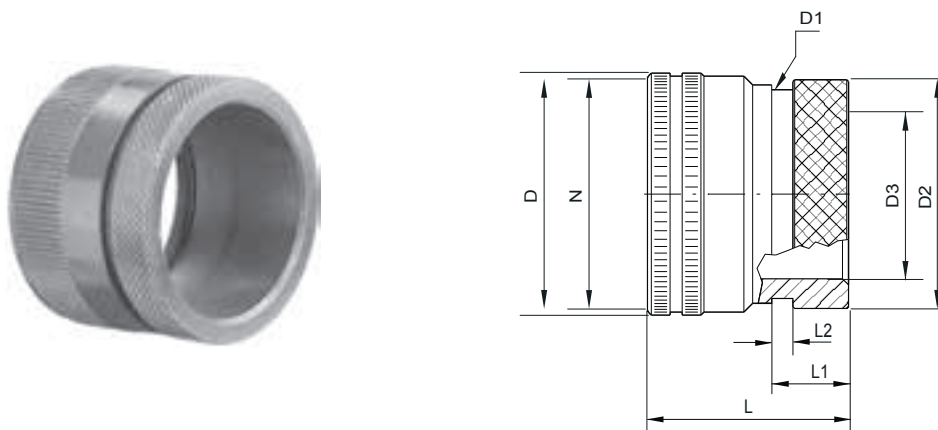


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductive [AA]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	D max.	N1 Thread (inches)	T	N2 Thread (metric)	Item number with adapter			Item number without adapter		
10	20	5/8"-20 UNEF 2B	29.9	M 12x1.5	BEN10-M1B-...	AC	AA	-	-	-
14	24	3/4"-20 UNEF 2B	31.4	M 12 / M 16x1.5	BEN14-M1B-...	AC	AA	BEN14-M2C-...	AC	AA
16	27	7/8"-20 UNEF 2B	30.5	M 16 / M 20x1.5	BEN16-M2B-...	AC	AA	BEN16-M3C-...	AC	AA
18	30	1 1/4"-20 UNEF 2B	33.0	M 20x1.5 / M 25	BEN18-M4B-...	AC	AA	BEN18-M3C-...	AC	AA
20	32	1 1/8"-18 UNEF 2B	35.5	M 20 / M 25x1.5	BEN20-M3B-...	AC	AA	BEN20-M4C-...	AC	AA
22	37	1 1/4"-18 UNEF 2B	35.5	M 32x1.5 / M 40	BEN22-M5B-...	AC	AA	BEN22-M5B-...	AC	AA
24	40	1 3/8"-18 UNEF 2B	38.5	M 32x1.5 / M 40	BEN24-M6B-...	AC	AA	BEN24-M5C-...	AC	AA
28	45	1 5/8"-18 UNEF 2B	38.5	M 32x1.5	BEN28-M6B-...	AC	AA	BEN28-M5C-...	AC	AA
32	52	1 7/8"-16 UN 2B	42.5	M 40x1.5	-	-	-	BEN32-M6C-...	AC	AA
36	58	2 1/16"-16 UN 2B	46.2	M 40x1.5	BEN36-M6B-...	AC	AA	-	-	-
40	64	2 5/16"-16 UN 2B	51.3	M 50x1.5	BEN40-M7B-...	AC	AA	-	-	-

... has to be replaced for: epoxy-polyurethan black, non conductive [AC]
 zinc cobalt black, conductive [AA]

Back shell with groove for heatshrinkable shapes

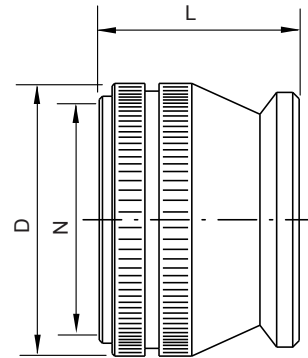
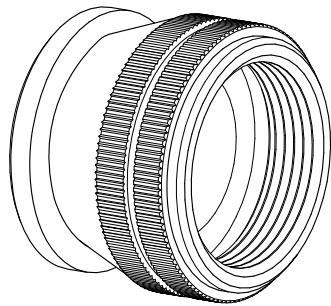
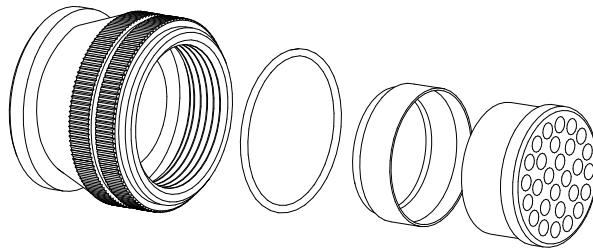


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	D max.	N Thread (inches)	D1	D2	D3	L max	L1	L2	Item number
10	20	$\frac{5}{8}$ "-24 UNEF 2B	13.3	15.5	7.9	18	11.7	3.5	BSH10-AC
14	24	$\frac{3}{4}$ "-20 UNEF 2B	17.0	19.1	10.8	18	11.7	3.5	BSH14-AC
16	27	$\frac{7}{8}$ "-20 UNEF 2B	21.9	23.9	13.7	30	11.7	3.5	BSH16-AC
18	30	1"-20 UNEF 2B	21.9	23.9	14.8	35	11.7	3.5	BSH18-AC
20	32	1 $\frac{1}{8}$ "-18 UNEF 2B	26.2	29.6	18.9	35	12.4	3.5	BSH20-AC
22	37	1 $\frac{1}{4}$ "-18 UNEF 2B	26.2	29.6	21.0	35	12.4	3.5	BSH22-AC
24	40	1 $\frac{3}{8}$ "-18 UNEF 2B	34.5	37.8	24.8	35	12.7	3.5	BSH24-AC
28	45	1 $\frac{5}{8}$ "-18 UNEF 2B	34.5	37.8	27.2	35	12.7	3.5	BSH28-AC
32	52	1 $\frac{7}{8}$ "-16 UN 2B	43.6	47.8	33.5	40	15.2	3.5	BSH32-AC
36	58	2 $\frac{1}{16}$ "-16 UN 2B	43.6	47.8	38.7	45	15.2	3.5	BSH36-AC
40	64	2 $\frac{5}{16}$ "-16 UN 2B	52.6	57.8	48.2	45	15.2	3.5	BSH40-AC

Suitable heatshrinkable shapes: see chapter 5.3.3

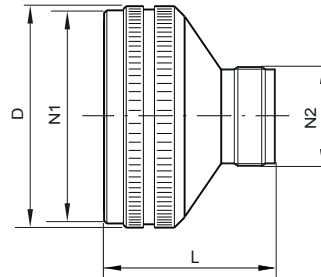
Termination back shell type R for grommets



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	D max.	N Thread (inches)	L max	Item number
10	20	$\frac{5}{8}$ "-24 UNEF 2B	20	BST10-AC
14	24	$\frac{3}{4}$ "-20 UNEF 2B	20	BST14-AC
16	27	$\frac{7}{8}$ "-20 UNEF 2B	21	BST16-AC
18	30	1"-20 UNEF 2B	24	BST18-AC
20	32	$1\frac{1}{8}$ "-18 UNEF 2B	24	BST20-AC
22	37	$1\frac{1}{4}$ "-18 UNEF 2B	33	BST22-AC
24	40	$1\frac{3}{8}$ "-18 UNEF 2B	33	BST24-AC
28	45	$1\frac{5}{8}$ "-18 UNEF 2B	34	BST28-AC
32	52	$1\frac{7}{8}$ "-16 UN 2B	34	BST32-AC
36	58	$2\frac{1}{16}$ "-16 UN 2B	34	BST36-AC
40	64	$2\frac{5}{16}$ "-16 UN 2B	36	BST40-AC

Reducer back shell



Material

Standard shell material: aluminium alloy

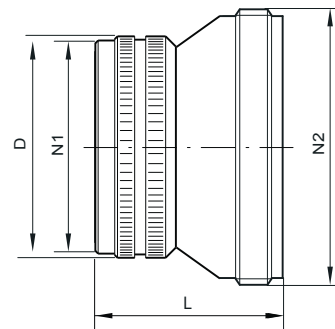
Standard shell surface: epoxy-polyurethan black, non conductive [AC]
zinc cobalt black, conductive [AA]

Other material / surface: see chapter 2.2.2 / on request

Seal: silicone, red

Size N1	Size N2	D	N1 Thread (inches)	N2 Thread (inches)	L	Item number	
18	16	29	1"-20 UNEF 2B	7/8"-20 UNEF 2A	50	BSR18-16-AC	BSR18-16-AA
24	18	40	1 3/8"-18 UNEF 2B	1"-20 UNEF 2A	40	BSR24-18-AC	BSR24-18-AA
32	18	52.5	1 7/8"-16 UN 2B	1"-20 UNEF 2A	56	BSR32-18-AC	BSR32-18-AA
36	18	60.5	2 1/16"-16 UN 2B	1"-20 UNEF 2A	60	BSR36-18-AC	BSR36-18-AA
40	32	65	2 5/16"-16 UN 2B	1 3/4"-18 UNS 2A	52	BSR40-32-AC	BSR40-32-AA
40	36	66	2 5/16"-16 UN 2B	2"-18 UNS 2A	65	BSR40-36-AC	BSR40-36-AA

Enlarger back shell



Material

Standard shell material: aluminium alloy

Standard shell surface: epoxy-polyurethan black, non conductive [AC]
zinc cobalt black, conductive [AA]

Other material / surface: see chapter 2.2.2 / on request

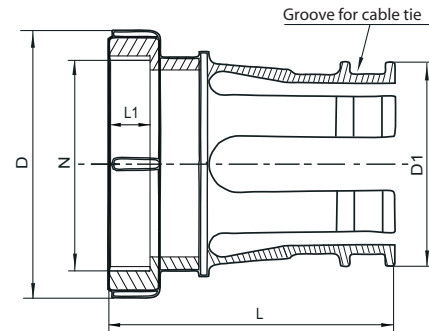
Seal: silicone, red

Size N1	Size N2	D	N1 Thread (inches)	N2 Thread (inches)	L	Item number	
18	24	32	1"-20 UNEF 2B	1 7/16"-18 UNEF 2A	33.5	BSE18-24-AC	BSE18-24-AA
24	32	40	1 3/8"-18 UNEF 2B	1 3/4"-18 UNS 2A	42	BSE24-32-AC	BSE24-32-AA
32	36	56	1 7/8"-16 UN 2B	2"-18 UNS 2A	35	BSE32-36-AC	BSE32-36-AA
36	40	60	2 1/16"-16 UN 2B	1 1/4"-16 UN 2A	35	BSE36-40-AC	BSE36-40-AA

5.3 Cable entries

5.3.1 Synthetic cable clamps

Cable clamps



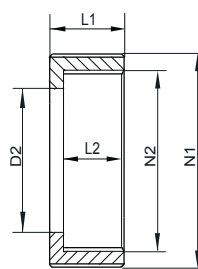
Material

Material of cable clamp: polyamide 66 (PA66)
Fire protection class: UL94-V0 free of halogene

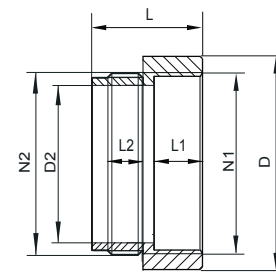
Size	Intermediate ring	D	N Thread (inches)	Cablebundle D1		L	L1	Item number
				min.	max.			
24 *	24/32	54	1 ³ / ₈ "-18 UNEF 2B	15	31	57	9.0	10-350349K-2432
32	without	54	1 ⁷ / ₈ "-16 UN 2B	15	34	57	9.0	10-350349K-323
36 *	36/40	66	2 ¹ / ₁₆ "-16 UN 2B	15	40	70	10.5	10-350349K-3640
40	without	66	2 ⁵ / ₁₆ "-16 UN 2B	15	42	70	10.5	10-350349K-403
40L *	40/40	66	2 ⁵ / ₁₆ "-16 UN 2B	15	42	85	10.5	10-350349K-4040

* Reduction or intermediate ring included

Reduction- and intermediate rings



A



B

Material

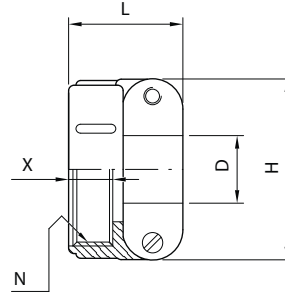
Material of intermediate ring: polyamide 66 (PA66)
Fire protection class: UL94-V0 free of halogene

Size	passt zu Kabelhalter	D1	N1 Thread (inches)	N2 Thread (inches)	D1	L	L1	L2	Fig.	Item number
24/32	32	-	1 ³ / ₈ "-18 UNEF 2B	1 ⁷ / ₈ "-16 UN 2A	31.5	9.0	9.0	7.0	A	10-350349RR-2432
36/40	40	-	2 ¹ / ₁₆ "-16 UN 2B	2 ⁵ / ₁₆ "-16 UN 2A	40.0	10.5	10.5	7.0	A	10-350349RR-3640
40/40 *	40	66	2 ⁵ / ₁₆ "-16 UN 2B	2 ⁵ / ₁₆ "-16 UN 2A	53.0	25.5	10.5	10.5	B	10-350349RR-4040

* for GB-/GV-connector series as per chapter 6.1

5.3.2 Metallic cable clamps

Cable clamp type A



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black, non conductive [AC]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

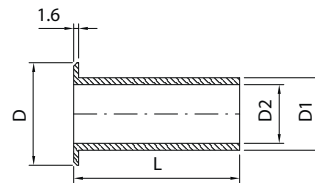
Size	N Thread (inches)	D	H	L	X	Item number
10	$\frac{5}{8}$ "-24 UNEF 2B	8.0	23.0	20.8	10.5	CA10-AC
14	$\frac{3}{4}$ "-20 UNEF 2B	11.0	28.0	22.4	10.5	CA14-AC
16	$\frac{7}{8}$ "-20 UNEF 2B	14.2	29.0	24.0	10.5	CA16-AC
18	1"-20 UNEF 2B	15.8	32.0	28.5	10.5	CA18-AC
20+22	$1\frac{3}{16}$ "-18 UNEF 2B	19.0	37.0	24.0	10.5	CA20-AC
24+28	$1\frac{7}{16}$ "-18 UNEF 2B	23.8	44.0	26.4	10.5	CA24-AC
32	$1\frac{3}{4}$ "-18 UNS 2B	31.7	54.0	28.0	12.5	CA32-AC
36	2"-18 UNS 2B	35.0	58.0	29.4	14.0	CA36-AC
40	$2\frac{1}{4}$ "-16 UN 2B	41.2	64.0	42.8	14.0	CA40-AC

X = overlap

For cable entry bush MS3420 Holder Type A

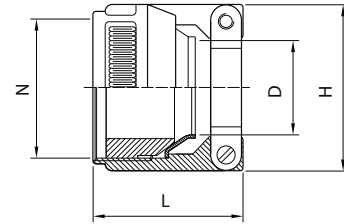


Material Bushing: MS3420
 Standard material of bushing: chloroprene



Size	D	D1	D2	L	Bushing to cable clamp	Item number
10	12.8	7.7	5.6	69	CA10-AC	MS3420-04
14	15.7	10.8	7.9	66	CA14-AC	MS3420-06
16	18.8	14.0	11.1	63	CA16-AC	MS3420-08
18	22.5	15.6	14.3	60	CA18-AC	MS3420-10
20+22	27.5	18.8	15.9	57	CA20-AC	MS3420-12
24+28	33.3	23.5	19.1	53	CA24-AC	MS3420-16
32	40.5	31.5	23.8	50	CA32-AC	MS3420-20
36	46.9	34.7	31.8	47	CA36-AC	MS3420-24
40	52.9	41.0	34.9	44	CA40-AC	MS3420-28

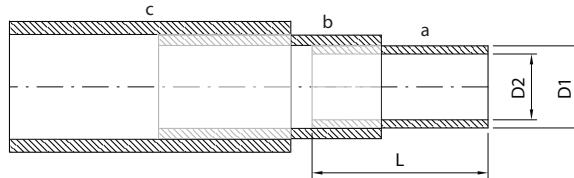
Cable clamp type C



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethan black, non conductive [AC]
 Other material / surface: see chapter 2.2.2 / on request
 Seal: silicone, red

Size	N Thread (inches)	Cable Ø clamping range		H	L	Item number
		max.	min.			
10	5/8"-24 UNEF 2B	7.9	2.5	23.0	34.0	CC10-AC
14	3/4"-20 UNEF 2B	11.0	5.8	26.0	34.0	CC14-AC
16	7/8"-20 UNEF 2B	13.6	8.0	29.0	34.0	CC16-AC
18	1"-20 UNEF 2B	15.9	10.0	32.0	36.0	CC18-AC
20+22	1 3/16"-18 UNEF 2B	19.0	11.3	38.0	36.0	CC20-AC
24+28	1 7/16"-18 UNEF 2B	23.8	15.5	44.0	39.0	CC24-AC
32	1 3/4"-18 UNS 2B	31.8	23.5	54.0	45.0	CC32-AC
36	2"-18 UNS 2B	35.0	25.5	58.0	53.0	CC36-AC
40	2 1/4"-16 UN 2B	41.3	30.0	64.0	53.0	CC40-AC

For cable entry bush MS3420 Holder Type C

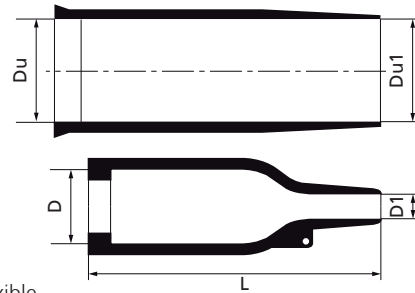


Material Bushing: MS3420-A
Standard material of bushing: chloroprene

Size	Cable Ø clamping range		Bushing Ø		L	Bushing-Size			Item number
	max.	min.	D1	D2		a	b	c	
10	5.6	0.3	7.8	5.6	50.8	4A	–	–	MS3420-4A
14	7.9	2.9	11.0	7.9	50.8	6A	–	–	MS3420-6A
	5.6	0.5	7.8	5.6	50.8	–	4A	–	MS3420-4A
16	11.1	5.6	13.6	11.1	50.8	8A	–	–	MS3420-8A
	7.9	2.2	11.0	7.9	50.8	–	6A	–	MS3420-6A
18	11.1	5.0	15.8	11.1	50.8	10A	–	–	MS3420-10A
	7.9	2.2	11.0	7.9	50.8	–	6A	–	MS3420-6A
20+22	13.7	6.9	18.9	13.7	50.8	12A	–	–	MS3420-12A
	11.1	4.5	13.6	11.1	50.8	–	8A	–	MS3420-8A
24+28	19.0	10.9	23.7	19.0	50.8	16A	–	–	MS3420-16A
	13.7	6.6	18.9	13.7	50.8	–	12A	–	MS3420-12A
	11.1	4.7	13.6	11.1	50.8	–	–	8A	MS3420-8A
32	23.8	15.7	31.6	23.8	50.8	20A	–	–	MS3420-20A
	19.0	11.2	23.7	19.0	50.8	–	16A	–	MS3420-16A
	13.7	6.9	18.9	13.7	50.8	–	–	12A	MS3420-12A
36	28.8	17.3	35.0	28.5	50.8	24A	–	–	MS3420-24A
	23.8	12.8	31.6	23.8	50.8	–	18A	–	MS3420-18A
	19.0	9.1	23.7	19.0	50.8	–	–	16A	MS3420-16A
40	31.8	20.7	41.1	31.8	50.8	28A	–	–	MS3420-28A
	23.8	13.0	31.6	23.8	50.8	–	20A	–	MS3420-20A
	19.0	9.3	23.7	19.0	50.8	–	–	16A	MS3420-16A

5.3.3 Heatshrinkable shapes

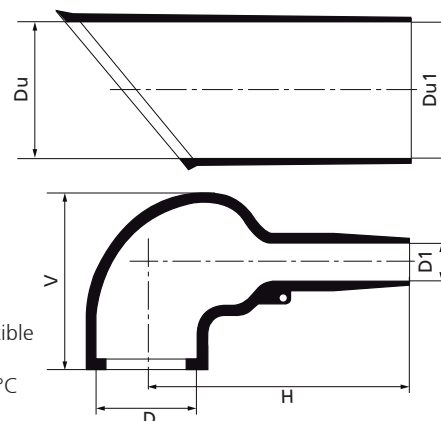
Heatshrinkable shapes, straight



Material Polyolefin, chemically cross linked, semiflexible
 Shrinking temperature: 135 °C
 Operating temperature: - 55 °C up to 135 °C
 Dielectric strength: 15kV/mm
 Flame retardant according to: ASTM D635
 Dimensions: valid for completely recovered (shrinked) parts

Size	expanded		recovered (shrinked)			Item number
	Du	Du1	D	D1	L ± 10%	
spez.	16.0	16.0	8.0	4.0	26.0	FT08-04
spez.	24.0	24.0	11.0	6.0	38.0	FT11-06
10	30.0	30.0	14.0	6.0	43.0	FT14-06
14-22	36.0	36.0	22.5	8.5	60.0	FT-23-09
24-36	60.0	60.0	35.0	16.0	90.0	FT35-16
40	66.0	66.0	45.0	17.0	130.0	FT45-17

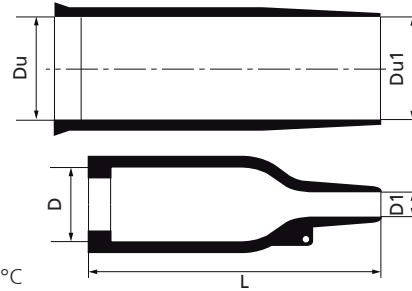
Heatshrinkable shapes, 90°-elbow



Material Polyolefin, chemically cross linked, semiflexible
 Shrinking temperature: 135 °C
 Operating temperature: - 55 °C up to 135 °C
 Dielectric strength: 15kV/mm
 Flame retardant according to: ASTM D635
 Dimensions: valid for completely recovered parts

Size	expanded		recovered (shrinked)				Item number
	Du	Du1	D	D1	V	H ± 10%	
10	30.0	30.0	14.0	6.0	27.0	32.0	FTW14-06
14-22	36.0	36.0	22.5	8.5	38.0	46.0	FTW23-09
24-36	60.0	60.0	35.0	16.0	54.0	80.0	FTW35-16
40	66.0	66.0	45.0	17.0	68.0	108.0	FTW45-17

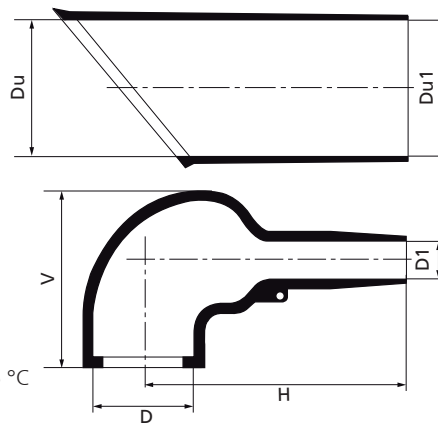
Heatshrinkable shapes, straight, free of halogene



Material Chemically cross linked, flexible
 Shrinking temperature: 135 °C
 Operating temperature: - 55 °C up to 105 °C
 Dielectric strength:14kV/mm
 Flame retardant according to: VG 95343
 Dimensions: valid for completely recovered (shrinked) parts

Size	expanded		recovered (shrinked)			Item number
	Du	Du1	D	D1	L ± 10%	
spez.	16.0	16.0	8.0	4.0	26.0	FTH08-04
spez.	24.0	24.0	11.0	6.0	38.0	FTH11-06
10	30.0	30.0	14.0	6.0	43.0	FTH14-06
14-22	36.0	36.0	22.5	8.5	60.0	FTH-23-09
24-36	60.0	60.0	35.0	16.0	90.0	FTH35-16
40	66.0	66.0	45.0	17.0	130.0	FTH45-17

Heatshrinkable shapes, 90°-elbow, free of halogene

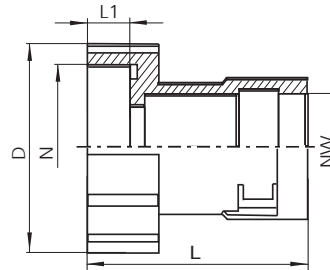


Material Chemically cross linked, flexible
 Shrinking temperature: 135 °C
 Operating temperature: - 55 °C up to 105 °C
 Dielectric strength:14kV/mm
 Flame retardant according to: VG 95343
 Dimensions: valid for completely recovered (shrinked) parts

Size	expanded		recovered (shrinked)				Item number
	D1	Du1	D	D1	V	H ± 10%	
10	30.0	30.0	14.0	6.0	27.0	32.0	FTHW14-06
14-22	36.0	36.0	22.5	8.5	38.0	46.0	FTHW23-09
24-36	60.0	60.0	35.0	16.0	54.0	80.0	FTHW35-16
40	66.0	66.0	45.0	17.0	68.0	108.0	FTHW45-17

5.3.4 Conduit fittings

PMA-Adapters



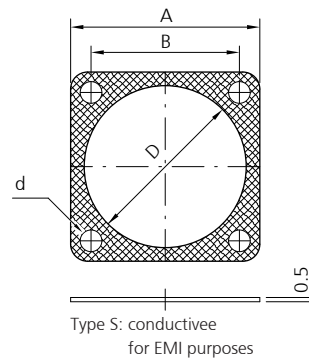
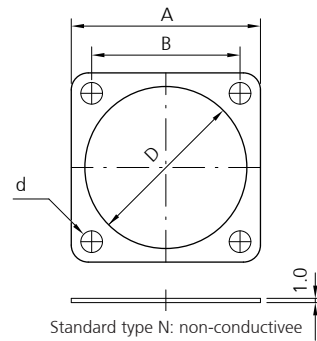
Material Polyamide 6 modified (PA6 mod.)
 Operation temperature: - 40 °C up to 105 °C, short term max. 160 °C
 Protecting class: IEC EN 60529 up to IP68

Size	PMA-conduit NW	D (mm)	N (inches)	L (mm)	L1 (mm)	Item- number
16	7	29	7/8"-20 UNEF	34.0	9	BVIVG-U21M
16	10	29	7/8"-20 UNEF	37.0	9	BVIVG-U210
16	12	29	7/8"-20 UNEF	38.2	9	BVIVG-U212
18	12	32	1"-20 UNEF	40.5	9	BVIVG-U242
18	23	32	1"-20 UNEF	55	9	BVIVG-U243
18	17	32	1"-20 UNEF	47.5	9	BVIVG-U247
20 + 22	23	35	1 3/16"-18 UNEF	55	9	BVIVG-U293
20 + 22	17	35	1 3/16"-18 UNEF	47.5	9	BVIVG-U297
20 + 22	29	39	1 3/16"-18 UNEF	47	9	BVIVG-U299
24 + 28	23	44	1 7/16"-18 UNEF	52	9	BVIVG-U353
24 + 28	36	51.5	1 7/16"-18 UNEF	63	9	BVIVG-U356
24 + 28	17	44	1 7/16"-18 UNEF	46.5	9	BVIVG-U357
24 + 28	29	44	1 7/16"-18 UNEF	52	9	BVIVG-U359
32	23	53	1 3/4"-18 UNS	52	10	BVIVG-U433
32	36	53	1 3/4"-18 UNS	62.5	10	BVIVG-U436
32	17	53	1 3/4"-18 UNS	46.5	10	BVIVG-U437
32	29	53	1 3/4"-18 UNS	51.5	10	BVIVG-U439
36	23	58	2"-18 UNS	51.5	10	BVIVG-U503
36	36	58	2"-18 UNS	62.5	10	BVIVG-U506
36	48	58	2"-18 UNS	64.5	10	BVIVG-U508
36	29	58	2"-18 UNS	55	10	BVIVG-U509
40	23	64	2 1/4"-16 UN	51	10	BVIVG-U563
40	36	64	2 1/4"-16 UN	62	10	BVIVG-U566
40	48	64	2 1/4"-16 UN	64	10	BVIVG-U568
40	29	64	2 1/4"-16 UN	51	10	BVIVG-U569

For more conduit fittings conduits from different manufactures, please contact our customer service.

5.4 Accessories

5.4.1 Sealing gaskets for receptacles



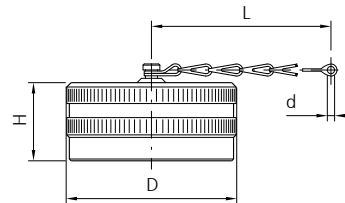
Material Standard: Polychloroprene: non-conductive / Protection class acc. to IEC EN 60529: up to IP68
Typ S: Alu-Flex: conductive / Protection class according to IEC EN 60529: up to IP65

Size	A	B	D		d	Item number *	
			Front Panel	Rear Panel		Front Panel mount	Rear Panel mount
10	25.4	18.2	15.9	18.2	4.4	10-40450-10	10-40451-10
14	30.0	23.0	22.2	24.6	4.4	10-40450-14	10-40451-14
16	32.5	24.6	25.4	27.4	4.4	10-40450-16	10-40451-16
18	35.0	27.0	28.6	30.8	5.2	10-40450-18	10-40451-18
20	38.0	29.4	31.8	34.2	5.2	10-40450-20	10-40451-20
22	41.0	31.8	34.9	37.4	5.2	10-40450-22	10-40451-22
24	44.5	34.9	38.1	40.9	5.2	10-40450-24	10-40451-24
28	50.8	39.7	44.5	46.7	5.2	10-40450-28	10-40451-28
32	57.0	44.5	50.8	53.4	5.6	10-40450-32	10-40451-32
36	63.5	49.2	57.0	59.6	5.6	10-40450-36	10-40451-36
40	69.9	55.5	61.9	65.5	5.6	10-40450-40	10-40451-40

*) For type **S** (conductive) = add **S** to Item number, e.g. 10-40450-10**S**

5.4.2 Protection Caps

Metallic protection caps to bayonet receptacles GB, GR and GS

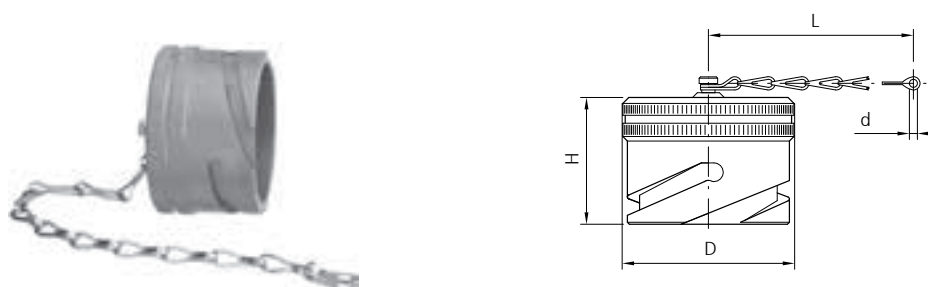


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Other material / surface: see chapter 2.2.2 / on request
 Material of chain: stainless steel
 Protection class according to IEC EN 60529: up to IP68/IP69K

Size	D	H	L	d	Item number
10SL	23.6	15.8	127	4.3	PR10SL-AC
14S	30.0	15.8	127	4.3	PR14S-AC
16S	33.0	16.0	127	4.3	PR16S-AC
16	33.6	21.7	127	4.3	PR16-AC
18	38.0	21.7	127	4.3	PR18-AC
20	40.5	21.7	127	4.3	PR20-AC
22	44.0	21.7	127	4.3	PR22-AC
24	47.0	21.7	127	4.3	PR24-AC
28	53.0	21.7	190	4.3	PR28-AC
32	60.0	21.7	190	4.3	PR32-AC
36	66.2	21.7	190	4.3	PR36-AC
40	72.4	21.7	190	4.3	PR40-AC
40	72.4	21.7	190	4.3	PR40-AC-GR *

* for GR and GS version

Metallic protection caps to bayonet plugs GB, GB and GS

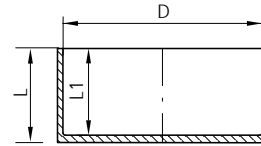


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Other material / surface: see chapter 2.2.2 / on request
 Material of chain: stainless steel
 Protection class according to IEC EN 60529: up to IP68/IP69K

Size	D	H	L	d	Item number
10SL	20.6	27.3	~ 127	4.3	PP10SL-AC
14S	27.0	27.3	127	4.3	PP14S-AC
16S	29.8	27.3	127	4.3	PP16S-AC
16	29.8	34.5	127	4.3	PP16-AC
18	33.0	34.5	127	4.3	PP18-AC
20	36.5	34.5	140	4.3	PP20-AC
22	39.7	34.5	140	4.3	PP22-AC
24	43.2	34.5	140	4.3	PP24-AC
28	48.9	34.5	190	4.3	PP28-AC
32	55.5	34.5	190	4.3	PP32-AC
36	61.6	34.5	190	4.3	PP36-AC
40	67.6	34.5	190	4.3	PP40-AC
40	67.6	34.5	190	4.3	PP40-AC-GR *

* for GR and GS version

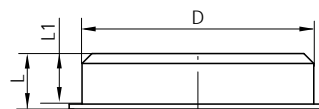
Plastic protection caps to bayonet receptacles GB, GR und GS for transport protection



Material Material of cap: thermoplast

Size	D	L max.	L1	Item number
10SL	18	13.0	12.0	PR10SL-D
14S	24	13.0	12.0	PR14S-D
16S	26	13.0	12.0	PR16S-D
16	26	18.5	17.5	PR16-D
18	30	18.5	17.5	PR18-D
20	33	18.5	17.5	PR20-D
22	37	18.5	17.5	PR22-D
24	40	18.5	17.5	PR24-D
28	46	18.5	17.5	PR28-D
32	53	18.5	17.5	PR32-D
36	59	18.5	17.5	PR36-D
40	65	18.5	17.5	PR40-D

Plastic protection caps to bayonet plugs GB, GR and GS for transport protection

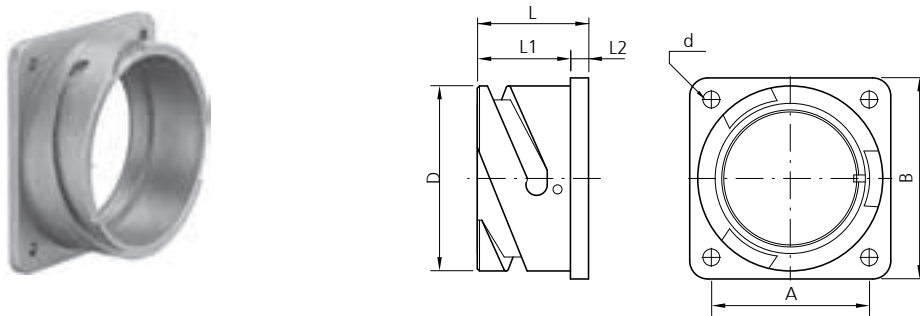


Material Material of cap: thermoplast

Size	D	L max.	L1	Item number
10SL	18	12.5	11.5	PP10SL-D
14S	24	12.5	11.5	PP14S-D
16S	26	12.5	11.5	PP16S-D
16	26	12.5	11.5	PP16-D
18	30	12.5	11.5	PP18-D
20	33	12.5	11.5	PP20-D
22	37	12.5	11.5	PP22-D
24	40	12.5	11.5	PP24-D
28	46	13.0	12.0	PP28-D
32	53	13.0	12.0	PP32-D
36	59	13.5	12.5	PP36-D
40	65	13.5	12.5	PP40-D

5.4.3 Dummy receptacles for series GB, GR, GS

Picture: Dummy receptacle GB40



Front panel mounting

Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Other material / surface: see chapter 2.2.2 / on request
 Dummy receptacles doesn't contain any contact insert.

Size	A	B	D	d	L	L1	L2	Item number
10SL	18.2	25.4	18.2	3.2	17.5	14.2	2.8	GB400-10SL-AC
14S	23.0	30.0	24.6	3.2	18.0	14.2	3.2	GB400-14S-AC
16S	24.6	32.5	27.4	3.2	18.8	14.2	3.2	GB400-16S-AC
16	24.6	32.5	27.4	3.2	23.5	19.0	3.2	GB400-16-AC
18	27.0	35.0	30.8	3.2	23.5	19.0	4.0	GB400-18-AC
20	29.4	38.0	34.2	3.2	23.5	19.0	4.0	GB400-20-AC
22	31.8	41.0	37.4	3.2	23.5	19.0	4.0	GB400-22-AC
24	34.9	44.5	40.9	3.7	25.5	20.6	4.0	GB400-24-AC
28	39.7	50.8	46.7	3.7	25.5	20.6	4.0	GB400-28-AC
32	44.5	57.0	53.4	4.4	27.0	22.2	4.0	GB400-32-AC
36	49.2	63.5	59.8	4.4	27.0	22.2	4.0	GB400-36-AC
40	55.6	70.0	66.0	4.4	27.0	22.2	4.0	GB400-40-AC
40	55.6	70.0	65.5	4.4	27.0	22.2	4.0	GR400-40-AC *

* for series GR and GS
 Dummy receptacle GB50 for rear panel mounting on request available.

6 Railway-specific connectors

6.1 GB and GV circular connectors for higher voltages

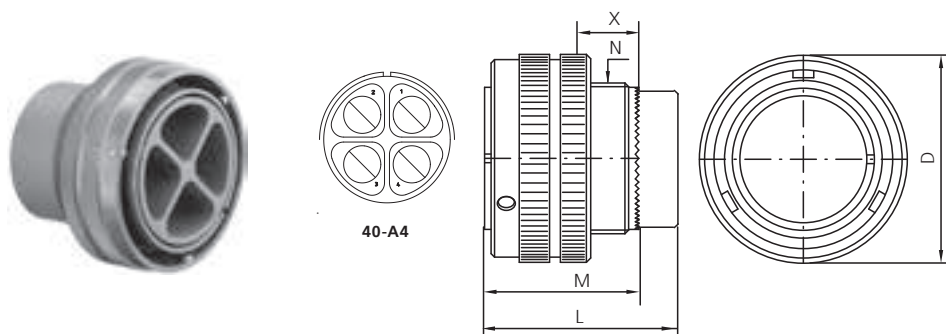
These circular connectors are basically identical to GB, GS and GR standard connector series.

They include an extra-long insert to increase the insulation clearance. This allows the connectors to be used for higher operating voltages.

- GB** Bayonet coupling with 1 guiding , key and hard- elastic contact insert.
GV According to GB, but with five guiding keys.

6.1.1 GB series circular connectors 4-pole, 1250VAC/200A

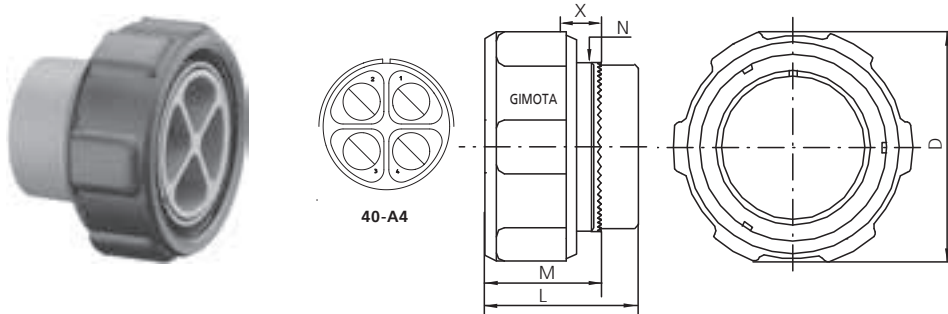
Plug: indoor, pin contacts size 0



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard material contact insert: silicone
 Alternative material/surface: see chapter 2.2.2 / on request

Layout	D	L	M	N	X	Item number
40-A4	73.0	60.0	38.5	Thread (inches) 2 ⁵ / ₁₆ "-16 UN 2A	11.3	GB60-40-A4PN-SAC

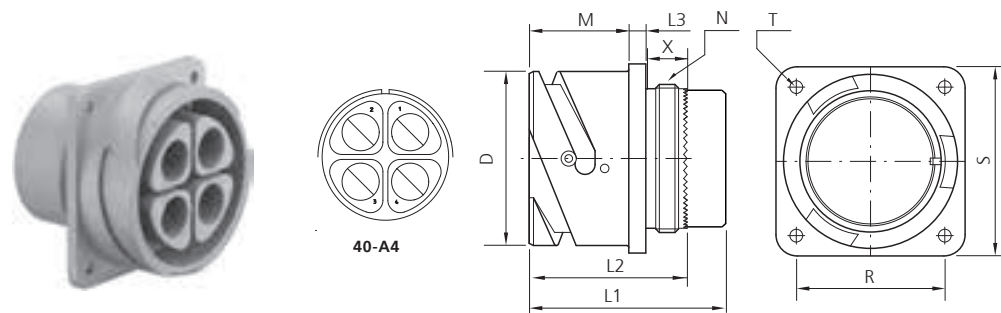
Plug: outdoor, pin contacts size 0



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard material contact insert: silicone
 Standard material rubbercoating: ethylene acrylate GXF
 Alternative material/surface: see chapter 2.2.2 / on request

Layout	D	L	M	N	X	Item number
40-A4	84.0	60.0	38.5	Thread (inches) 2 ⁵ / ₁₆ "-16 UN 2A	11.3	GB603-40-A4SN-SAC

Receptacle: in- and outdoor, socket contacts size 0/0*

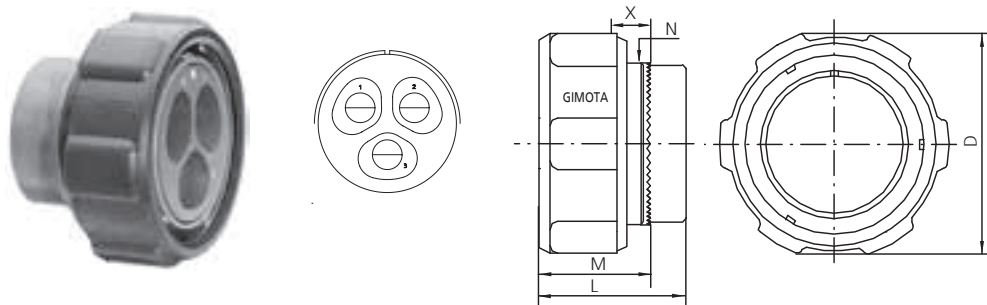


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard material contact insert: silicone
 Alternative material/surface: see chapter 2.2.2 / on request

Layout	S	R	D	T	N	L1	L2	L3	M	X	Item number
40-A4	70.0	55.6	66.0	4.4	Thread (inches) 2 ⁵ / ₁₆ "-16 UN 2A	60.0	38.0	4.0	22.2	11.3	GB210-40-A4PN-SAC

6.1.2 GV series circular connectors 3 – 16 pole, 1000 – 3000VAC/46 – 80A

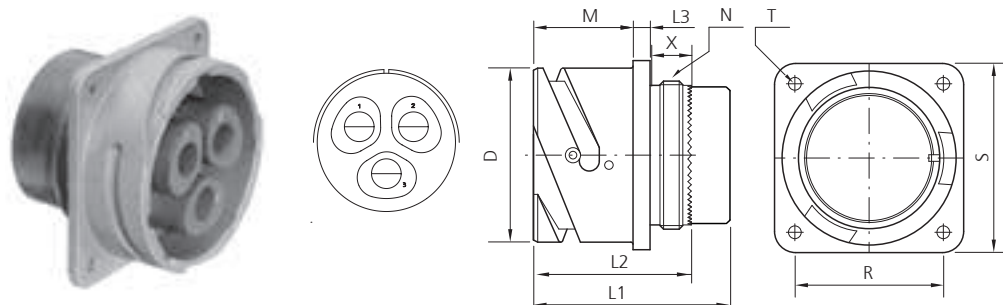
Plug: outdoor, up to 3000VAC/80A, pin contacts size 4



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard material contact insert: ethylene acrylate GFX
 Standard-Material rubbercoating: ethylene acrylate GFX
 Alternative material/surface: see chapter 2.2.2 / on request

Layout	D	L	M	N Thread (inches)	X	Item number
40-A3	84.0	60.0	38.5	2 ⁵ / ₁₆ "-16 UN 2A	11.3	GV603-40-A3PN-EAC

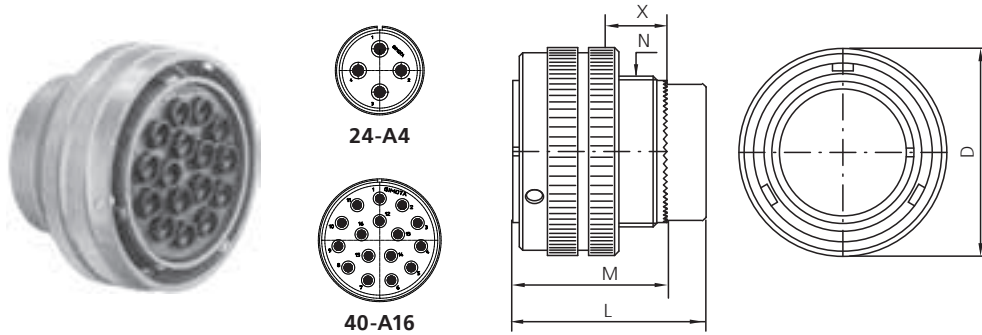
Receptacle: outdoor, up to 3000VAC/80A, socket contacts size 4



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard Insert: ethylene acrylate
 Alternative material/surface: see section 2.2.2 / on request

Layout	S	R	D	T	N Thread (inches)	L1	L2	L3	M	X	Item number
40-A3	70.0	55.6	66.0	4.4	2 ⁵ / ₁₆ "-16 UN 2A	60.0	38.0	4.0	22.2	11.3	GV210-40-A3SN-EAC

Plug: indoor, up to 1000VAC/46A, contact size 8H

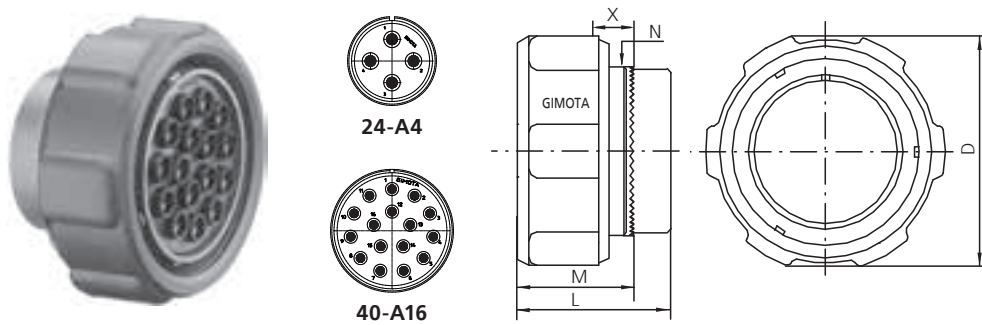


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard Insert: ethylene acrylate
 Disc for increasing insulation clearance: thermoplastic
 Alternative material/surface: see section 2.2.2 / on request

Layout	D	L	M	N Thread (inches)	X	Item number
24-A4	48.0	50.0	36.0	1 ³ / ₈ "-18 UNEF 2A	9.0	GV60-24-A4SN-EAC
40-A16	73.0	50.0	38.5	2 ⁵ / ₁₆ "-16 UN 2A	11.3	GV60-40-A16SN-EAC

Pin contact insert on request

Connector: outdoor, up to 1000VAC/46A, contact size 8H

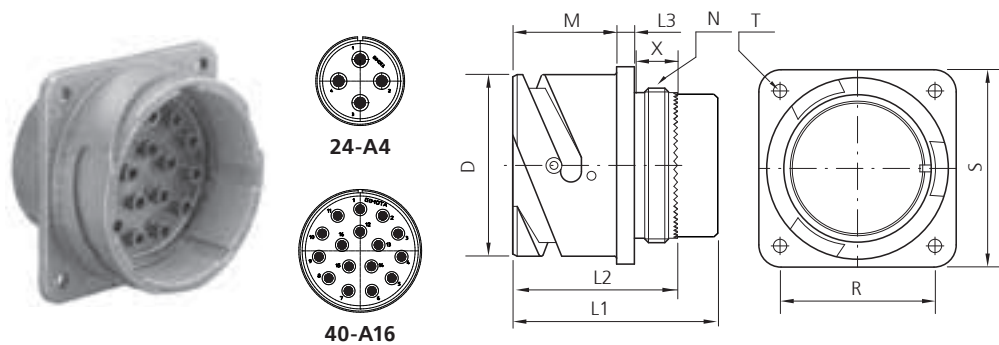


Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard material contact insert: ethylene acrylate GFX
 Standard-Material rubbercoating: ethylene acrylate GFX
 Disc for increased insulation clearance: thermoplastic
 Alternative material/surface: see chapter 2.2.2 / on request

Layout	D	L	M	N Thread (inches)	X	Item number
24-A4	58.0	50.0	36.0	1 ³ / ₈ "-18 UNEF 2A	9.0	GV603-24-A4SN-EAC
40-A16	88.0	50.0	38.5	2 ⁵ / ₁₆ "-16 UN 2A	11.3	GV603-40-A16SN-EAC

Pin contact insert on request

Receptacle: indoor and outdoor, up to 1000VAC/46A, pin contacts size 8H



Material Standard shell material: aluminium alloy
 Standard shell surface: epoxy-polyurethane, black
 Standard material contact insert: ethylene acrylate GXF
 Disc for increased insulation clearance: thermoplastic
 Alternative material/surface: see chapter 2.2.2.3 / on request

Layout	S	R	D	T	N	L1	L2	L3	M	X	Item number
24-A4	44.5	34.9	40.9	3.7	1 ³ / ₈ "-18 UNEF 2A	50.0	36.0	4.0	20.6	9.0	GV210-24-A4PN-EAC
40-A16	70.0	55.6	66.0	4.4	2 ⁵ / ₁₆ "-16 UN 2A	50.0	37.5	4.0	22.2	11.3	GV210-40-A16PN-EAC

Socket contact insert on request

6.2 GU series circular connectors (Jumbo) size 48

6.2.1 Introduction

General introduction

Description

The size 48 circular connectors (Jumbo) belong to the GU series. They are equipped with a bayonet coupling ring including rolling studs. Steel pins are applied at the bayonet ramp for numerous mating-cycles and higher toughness. Five guiding keys ensure reinforced mating. They correspond to protection class IP68 according to IEC EN 60529 and have a rubber coated bayonet ring with dust protection lip. Therefore these connectors are very well suitable for outdoor applications.

Material

The shell is made of aluminium alloy with a polyurethane-varnished surface. The bayonet ring has a coating of fire-retarded and halogen-free ethylene acrylate. The 58-pin insert is also made of ethylene acrylate, while the 4-pin power contact insert is made of thermoplastic.

The connectors are RoHS compliant.

Watertightness

The connectors of the GU series comply with ingress protection classes IP68 according to IEC EN 60529 aswell as IP69K according DIN40050. During assembly, an O-ring can be applied into the appropriate groove on the receptacle flange to ensure watertightness towards the mounting panel.

EMI-shielding

Please contact your local GIMOTA partner or GIMOTA AG for specific EMI screen application solutions.

Dimensions

Unless otherwise stated, all dimensions are mentioned in millimeters.

6.2.2 Electrical characteristics

All electrical data are stated at sea level and at standard temperature of 20 °C.
Deviating environment conditions have to be considered for connector evaluation.

Connectors

Voltages				Isolation				
Voltage-Index		Operating voltage		Test voltage	Flash-over	Creepage distance	CTI value	Insulation resistance
		DC	AC					
[-]		[V]	[V]	[VAC]	[VAC]	≥[mm]	IEC60664	[MΩ]
D	MIL	1250	900	2800	3600	4.8	≥ 300	≥ 5000

MIL: Requirements acc. to MIL-DTL 5015:
Values indicated on table above are applicable only if adequate safety measures are taken. That means the connection area of plug / Receptacle must be protected completely against pollution and humidity by an adequate cable clamp. Without safety precautions the operating voltage to grounding must not exceed 50 V.

Contacts

Size of contact			4/0	8H	12
Nominal current	continuous	[A]	225	56	23
Maximum current	short term	[A]	350	90	41
Test current		[A]	225	72	35
Contact resistance ¹⁾		[mΩ]	≤ 0.2	≤ 1.0	≤ 3.0

¹⁾ Verification according VG95234 / 2 / Test 5.10.1 and VG95210 / 37

6.2.3 Mechanical properties

Connector, size 48

Bayonet coupling - torque ¹⁾

to lock	max.	[Nm]	10
to open	min.	[Nm]	5.9
	max.	[Nm]	10

¹⁾ Verification according to VG95319 / 2 / Test 5.8.2

Contacts

Size of contact		4/0	8H	12
Contact material		copper alloy		
Gold plated: min. 0.5 µm Au over min. 2.5 µm Ni		---	o	x
Silver plated: min. 3.5 µm Ag		x	x	o
Contact mating force ¹⁾	nom. [N]	---	80	55
Contact separating force	nom. [N]	---	30	15

Plating on contactarea: **x** = standard, **o** = on request

¹⁾ Verification according to VG95319 / 2 / Test 5.4 and 5.7

Shell parts

Surface treatment	epoxy-polyurethane
Surface code	C
Shell material	aluminium alloy
Thickness of surface treatment	13 –16 µm
Surface colour	black
Corrosion resistance ¹⁾	500 h
Operating temperature	-55 to +125 °C
Electrical conductivity ²⁾	non-conductive

Other surface treatments on request.

¹⁾ Verification according to MIL 1344A Test 1001.1

²⁾ Verification according to MIL 1344A Test 3007

6.2.4 Thermal properties / Fire characteristics

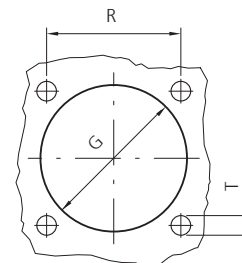
Contact insert

Layout	48-58	48-4
Material	ethylene acrylate GXF	thermoplastic
Operating temperature	-55 to +150 °C	-40 to +130 °C
Fire protection class UL94	V0 ¹⁾	-
Fire protection class NFF16-101/102	I3/F0	I3/F3
Fire protection class DIN5510	S4/SR2/ST2	-

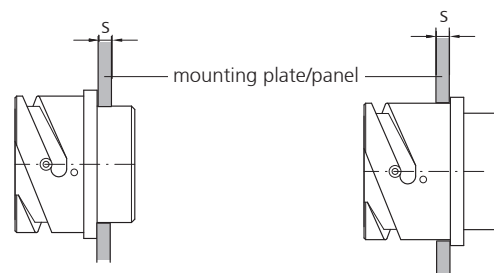
¹⁾ Flame retardant, halogen-free

6.2.5 Dimension S

Panel cut out for receptacle with flange



Size	R +/-0.1	G		T	
		Front panel mounting	Rear panel mounting	with through holes	with threaded holes
48	90.0	84.5	91.0	8.5	8.5

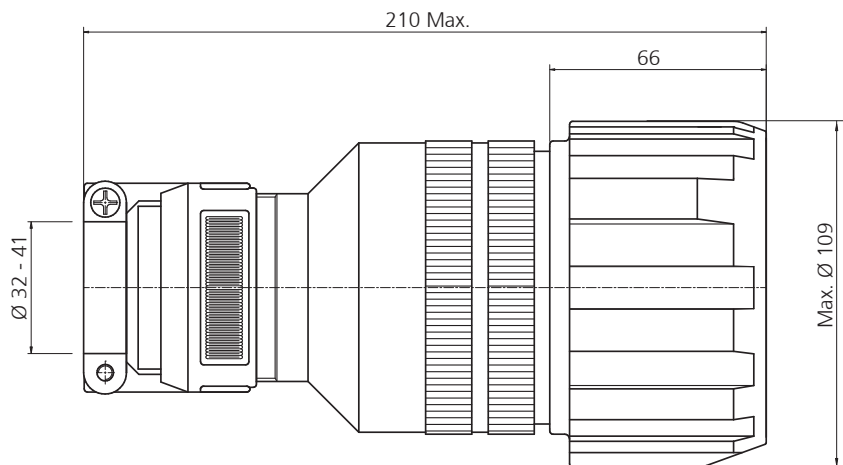


Size	Front panel mounting s max.	Rear panel mounting s max.
48	8.50	10.00

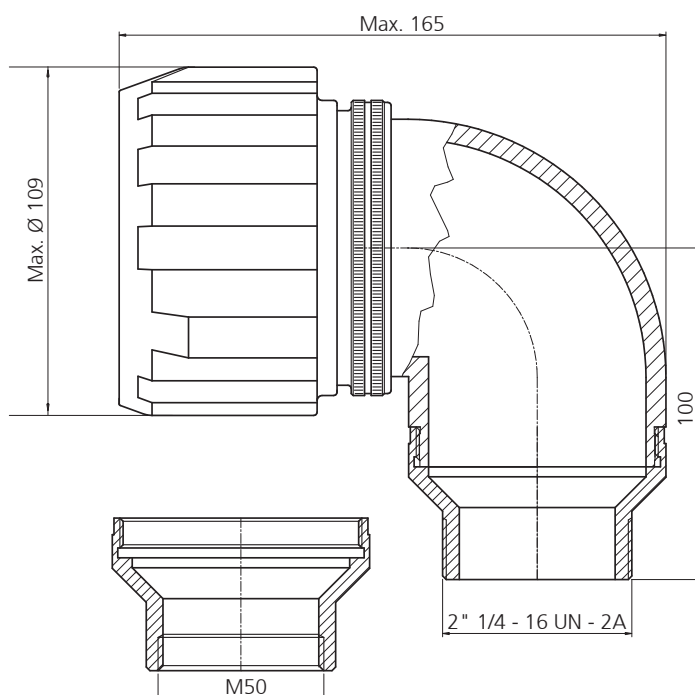
The front panel mounting dimensions are relevant only if a back-shell is used.

Dimensions GU

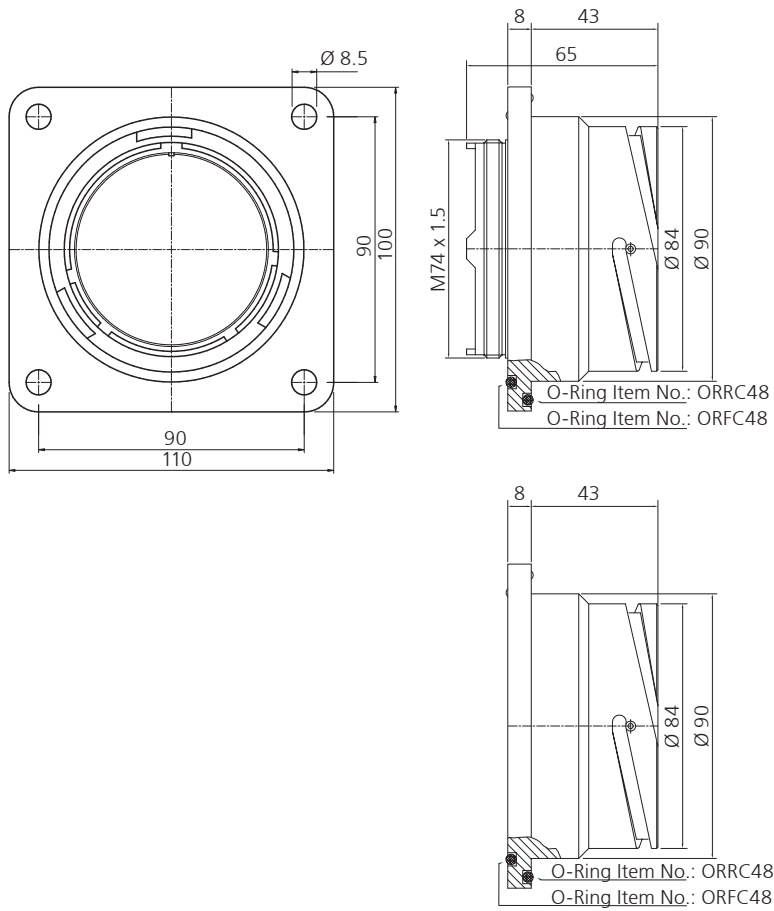
Plug, straight, with back shell and cable clamp type C size 40



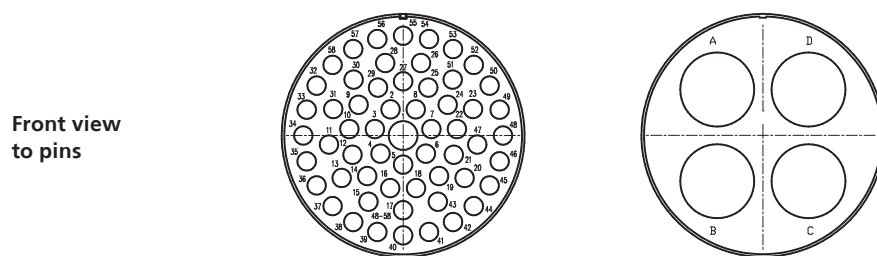
Plug, 90° elbow, with female- or male thread adapter



Receptacle for front- or rear panel mount / dummy receptacle



6.2.6 Contact insert, overview



Layout	48-58		48-4
Number of Contacts	1	57	4
Size of contacts	8H	12	4/0
Voltage -Index	D		D

6.2.7 Individual parts

Individual parts for GU plug / receptacle / accessories


Description

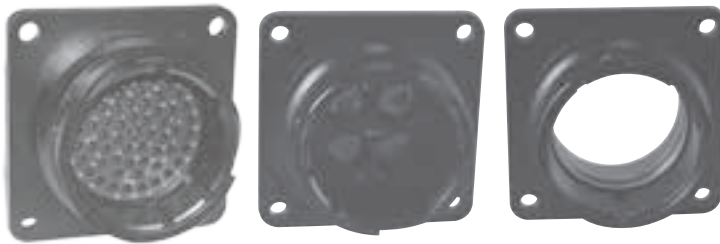
58-pole Plug for socket contacts

4-pole Plug for socket contacts

Item number

GU602-48-58SN-EAC

GU602-48-4SN-TAC


Description

58-pole Plug for pin contacts

4-pole Plug for pin contacts

Dummy receptacle

Item number

GU310-48-58PN-EAC

GU310-48-4PN-TAC

GU400-48-AC


Description

Back shell, straight, with connecting thread size 40

Item number

BSR48-40A-AC-A01


Description

Cable clamp typ C size 40

Item number

CC40-AC



Description	Item number
Back shell, 90° elbow, with connecting thread for adapters Not for use with contact insert 48-4.	BEN48-AC



Description	Item number
Male thread adapter to size 40 for BEN48-AC	BSX48-40A-AC-A01



Description	Item number
Female thread adapter M50 x 1.5 mm for BEN48-AC	BSX48-M7B-AC-A01

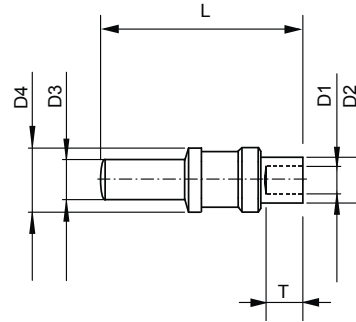


Description	Item number
O-Ring for receptacle at front panel mount; Ø = 88 mm	ORFC48
O-Ring for receptacle at rear panel mount; Ø = 98 mm	ORRC48

other components on request

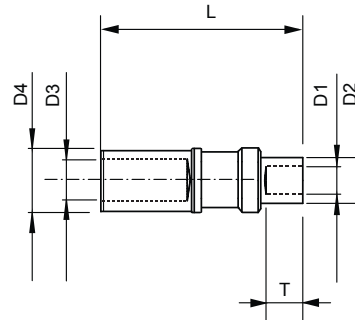
6.2.8 Contacts

Power contact size 4/0



Material **Pin contact**
 Contact material: Cu alloy
 Contact surface: silver plated/min. 3.5 μm
 Electrical properties see chapter 6.2.2

Conductor mm ²	Stripping	D1	D2	D3	D4	T	L	Item number
120	33.0	16.5	20.0	12.7	20.0	31.0	63.0	10-660-4/0-120G10
95	30.0	15.5	20.0	12.7	20.0	28.0	60.0	10-660-4/0-95G10
70	30.0	14.4	20.0	12.7	20.0	28.0	60.0	10-660-4/0-70G10

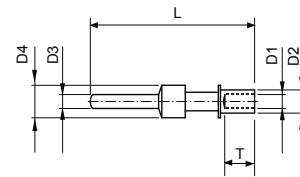


Material **Socket contact**
 Contact material: Cu alloy
 Contact surface: silver plated/min. 3.5 μm
 Electrical properties see chapter 6.2.2

Conductor mm ²	Stripping	D1	D2	D3	D4	T	L	Item number
120	33.0	16.5	20.0	12.7	20.0	31.0	63.0	10-904-4/0-120G10
95	30.0	15.0	20.0	12.7	20.0	28.0	60.0	10-904-4/0-90G10
70	30.0	14.4	20.0	12.7	20.0	28.0	60.0	10-904-4/0-70G10

6.2.9 Contacts size 8H, 12

The given cross sections and AWG sizes are reference values and based on market available wires and conductors that have been pressed with GIMOTA-crimping tools. Individual qualification testing by the user is recommended.

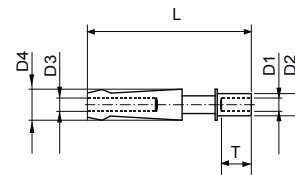


Material

Pin contact

Contact material: Cu alloy
 Contact surface: silver plated/min. 3.5 µm
 Electrical properties see chapter 6.2.2

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG								
8H	1.5	16	9.0	1.75	4.00	3.6	7.8	8.5	41.0	10-40794-18 AG
8H	2.5	12	9.0	2.30	4.00	3.6	7.8	8.5	41.0	10-40794-22 AG
8H	6	10	9.0	3.55	5.00	3.6	7.8	8.5	41.0	10-40794-38 AG
8H	10	6	13.0	4.60	6.35	3.6	7.8	12.2	41.0	10-40794-50 AG



Material

Socket contact

Contact material: Cu alloy
 Contact surface: silver plated/min. 3.5 µm
 Electrical properties see chapter 6.2.2

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG								
8H	1.5	16	9.0	1.75	4.00	3.6	7.8	8.5	38.0	10-40796-18 AG
8H	2.5	12	9.0	2.30	4.00	3.6	7.8	8.5	38.0	10-40796-22 AG
8H	6	10	9.0	3.55	5.00	3.6	7.8	8.5	38.0	10-40796-38 AG
8H	10	6	13.0	4.60	6.35	3.6	7.8	12.2	38.0	10-40796-50 AG

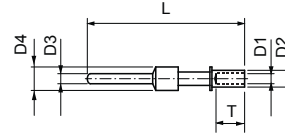
8H „Lamella contacts“ for higher current

Material Pin contacts

Material of contacts: Cu alloy

Surface of contacts*: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni**AG** = silver plated: min. 3,5 µm

Electrical properties see chapter 6.2.2



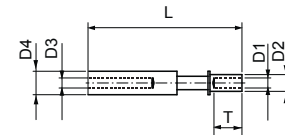
Contact size	Conductor mm ²	AWG	strip- ping	D1	D2	D3	D4	T	L	Item number
12	0.5	22-20	9.0	1.10	3.00	2.4	4.8	8.5	38.0	10-40561-11 AU*
12	0.75-1.0	22-18	9.0	1.45	3.35	2.4	4.8	8.5	38.0	10-40561-15 AU*
12	1.5	18-16	9.0	1.75	3.95	2.4	4.8	8.5	38.0	10-40561-18 AU*
12	2.5	14	9.0	2.25	3.95	2.4	4.8	8.5	38.0	10-40561-22 AU*
12	4	12-10	9.0	2.95	4.75	2.4	4.8	8.5	38.0	10-40561-30 AU*
12	6	10	9.0	3.50	4.75	2.4	4.8	8.5	38.0	10-40561-38 AU*

* To order silver plated contacts, replace **AU** with **AG****Material Socket contacts**

Material of contacts: Cu alloy

Surface of contacts*: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni**AG** = silver plated: min. 3,5 µm

Electrical properties see chapter 6.2.2



Contact size	Conductor mm ²	AWG	srip- ping	D1	D2	D3	D4	T	L	Item number
12	0.5	22-20	9.0	1.10	3.00	2.4	4.8	8.5	38.0	10-40560-11 AU*
12	0.75-1.0	22-18	9.0	1.45	3.35	2.4	4.8	8.5	38.0	10-40560-15 AU*
12	1.5	18-16	9.0	1.75	3.95	2.4	4.8	8.5	38.0	10-40560-18 AU*
12	2.5	14	9.0	2.25	3.95	2.4	4.8	8.5	38.0	10-40560-22 AU*
12	4	12-10	9.0	2.95	4.75	2.4	4.8	8.5	38.0	10-40560-30 AU*
12	6	10	9.0	3.50	4.75	2.4	4.8	8.5	38.0	10-40560-38 AU*

* To order silver plated contacts, replace **AU** with **AG**

Filler plugs for contact cavity size 8H and 12 see chapter 5.1.2

6.2.10 Assembling tools

Press head RHC131 for contact size 4/0



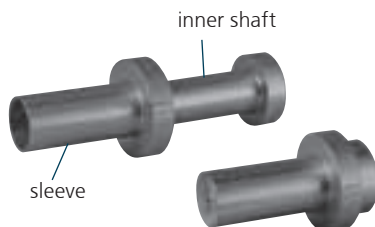
RHC131

Hydraulic press head with exchangeable press dies for various cross-sections. Rapid action hydraulic coupling for connection to pump. End operating pressure 700 bar.

Dimensions: 232 mm x 124 mm
Weight: 3.9 kg

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
4/0	70	–	RHC131	WMPS GR4/0/70-C
4/0	95	–	RHC131	WMPS GR4/0/95-C
4/0	120	4/0	RHC131	WMPS GR4/0/120-C

Extraction tool for power contact size 4/0



Use: pull-out the inner shaft till the stop. Push the sleeve over the contact into the Insert cavity to release the engagement clip. Now push the innershaft against the contact. The contact can be removed towards the cable entry side.

Description	Item number
Extraction tool for power contacts size 4/0	WML0 BU/STI GR4/0

Crimping tools, Push- in and extraction tools for standard contacts

Use standard tools according chapter 7 for standard contacts size 8H and 12.

6.3 GM modular series circular connectors

6.3.1 Introduction

General introduction

Description

The GM modular connector series are circular connectors with bayonet coupling suitable for outdoor use. The GM series connectors are available with seven, four or one cavity for electrical, optical or filler modules. The modules are independent connectors-within-the-connector. Individual screen adaptation and cable termination allow independent use of the modules. GM connectors can be coded to avoid mating failures. The module cavities are marked with numbers for correct application to the module carrier. A guiding notch on the modules ensures a precise alignment of the contact layouts. Electrical modules with four-, five-, seven-, or ten-pole contact inserts are available as a standard. The EMI adapter is designed for screen compression by a screening sleeve. The application of a heatshrinkable shapes ensure appropriate cable strain relieve and sealing performances at the cable.

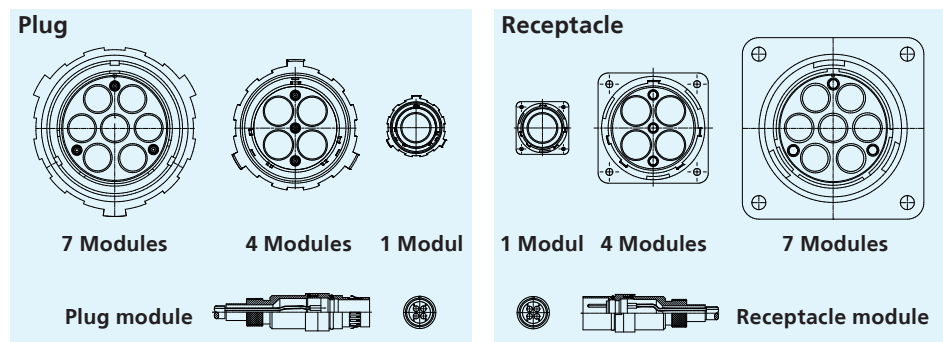
GM plugs are configured as following:

GM modular plug » plug modules » equipped with socket contacts

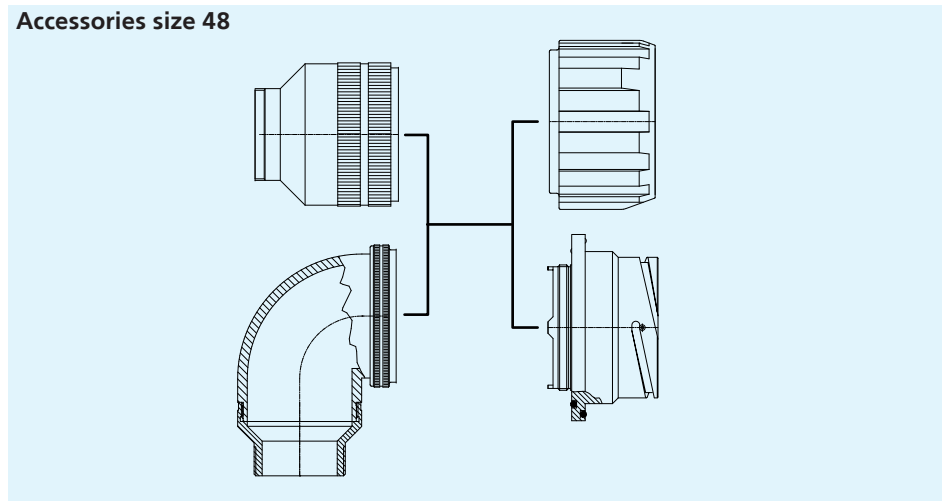
GM receptacles are configured as following:

GM modular receptacle » receptacle module » equipped with pin contacts

Arrangement / modularity



Accessories size 48



Material

The GM connector shell is made of aluminium alloy with a polyurethane-varnished surface. The bayonet ring has a coating of fire-retarded and halogen-free ethylene acrylate. The module carrier is made of thermoplastic.

The connectors are RoHS compliant.

Watertightness

The connectors of the GM series comply with ingress protection classes IP68 according to IEC EN 60529 as well as IP69K according to DIN 40050. Each module is additionally sealed by an O-ring. The design ensures high sealing performances especially in the longitudinal direction inside the connection. During assembly an O-ring can be applied into the appropriate groove on the receptacle size 48 flange to ensure watertightness towards the mounting panel. For receptacle sizes 24 and 40 the standard sealing washer according to Chapter 5.4.1 can be used.

EMI-shielding

The EMI shielding of the plug modules is ensured by grounding fingers and with a compressed 360° screen adaptation to the back shell. Screen adaptation to the receptacle modules is also realized by a 360° compression by a shielding sleeve to the backshell. If mated, plug- and receptacle modules provide a screened unit independent from the other modules applied to the GM connectors.

Dimensions

Unless otherwise stated, all dimensions are in millimeters.

6.3.2 Electrical characteristics

All electrical data are stated at sea level and at standard temperature of 20 °C. Deviating environment conditions have to be considered for plug evaluation.

Plug module / Receptacle module

Voltage-Index				Insulation				
		Operating voltage		Test voltage	Flash-over	Creepage distance	CTI value	Isulation resistance
		DC	AC					
[-]		[V]	[V]	[VAC]	[VAC]	≥[mm]	IEC60664	[MΩ]
INST	MIL	250	200	1000	1400	1.6	≥ 300	≥ 5000
SPEC.	---	750	600	1500	---	---	---	≥ 5000

MIL: Requirements acc. to MIL-DTL-5015:

Values indicated on table above are applicable only if adequate safety measures are taken. That means the connection area of plug / Receptacle must be protected completely against pollution and humidity by an adequate cable clamp. Without safety precautions the operating voltage to grounding must not exceed 50 V.

Contacts

Size of contact			16S	20
Nominal current	continuous	[A]	13	7.5
Maximum current	short term	[A]	22	12
Test current		[A]	20	9
Contact resistance ¹⁾		[mΩ]	≤ 6.0	≤ 10

¹⁾ Verification according VG95234 / 2 / Test 5.10.1 and VG95210 / 37

6.3.3 Mechanical properties

Connectors

Bayonet coupling - torque ¹⁾			1 Modul	4 Modules	7 Modules
Connector size			24	40	48
to lock	max.	[Nm]	6.5	10	10
to open	min.	[Nm]	2.0	5.9	5.9
	max.	[Nm]	6.5	10	10

¹⁾ Verification according to VG95319 / 2 / Test 5.8.2

Contacts

Size of contacts			16S	20
Contact material			copper alloy	
Gold plated: 0.5 µm Au über 2.5 µm Ni			x	x
Silver plated: 3.5 µm Ag			o	o
Contact mating force ¹⁾	nom.	[N]	5	1.8
Contact separating force ¹⁾	nom.	[N]	1	0.3

Electroplated contact surface: **x** = standard / **o** = on request

¹⁾ Verification according to VG95319 / 2 / Test 5.4 and 5.7

Shell parts

	Modular Connector Plug and Receptacle	Module
Shell material	aluminium alloy	
Surface treatment	epoxy-polyurethane varnished	electroless nickel
Surface code	C	E
Thickness of protective layer	13 –16 µm	12 - 15 µm
Colour	black	blank
Corrosion resistance ¹⁾	500 h	48h
Operating temperature	-55 to +125 °C	-55 to +125 °C
Electrical conductivity ²⁾	non-conductive	≤ 0,5 mΩ

Other surface treatments on request.

¹⁾ Verification according to MIL 1344A Test 1001.1

²⁾ Verification according to MIL 1344A Test 3007

6.3.4 Thermal properties / Fire characteristics

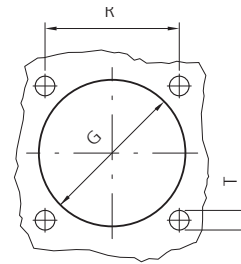
	Module support	Module insert
Material	thermoplastic	ethylene acrylate GXF
Operating temperature	-40 to + 130°C	-55 to + 150°C
Fire protection class UL94	-	V0 ¹⁾
Fire protection class NFF16-101/102	I3/F3	I3/F0
Fire protection class DIN5510	-	S4/SR2/ST2

¹⁾ Flame retardant, halogen-free

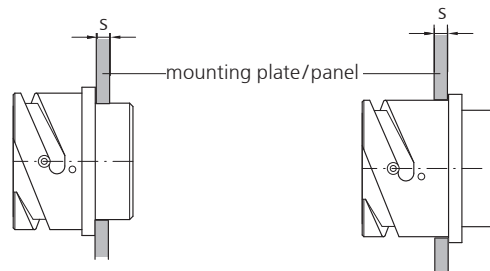
6.3.5 Dimensions

Panel cut out

for receptacle with flange



Size	R +/-0.1	G		T	
		Front panel mounting	Rear panel mounting	Flange with through holes	Flange with threaded holes
24	34.9	36.0	41.8	3.9	5.5
40	55.5	61.0	66.4	4.5	5.5
48	90.0	84.5	91.0	8.5	-

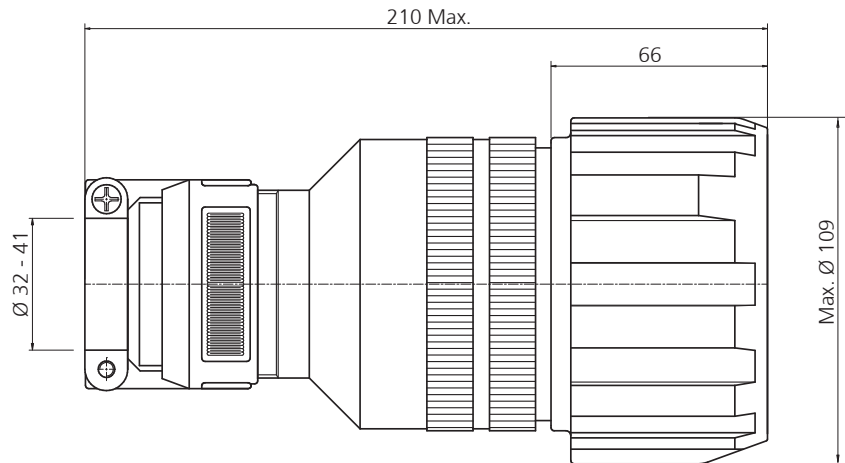


Size	Front panel mounting s max.	Rear panel mounting s max.
24	5.25	7.50
40	6.00	7.50
48	8.50	10.00

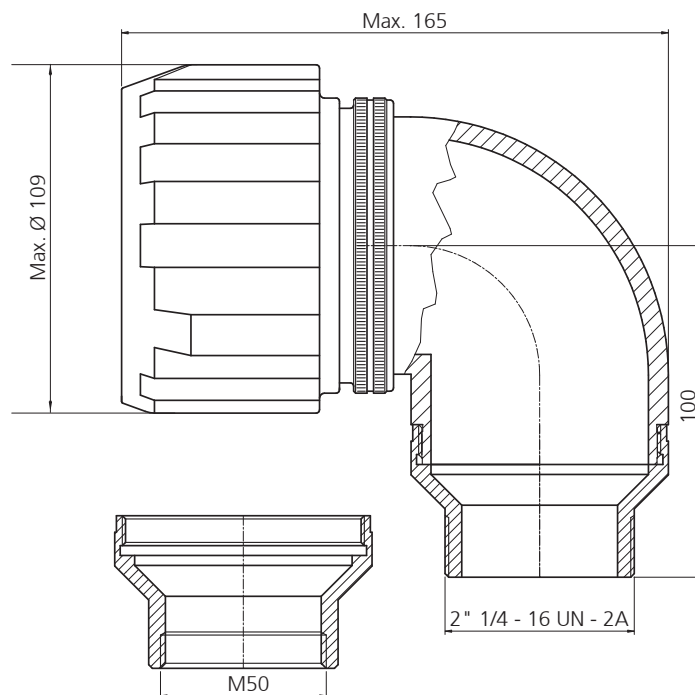
The front panel mounting dimensions are relevant only if a back-shell is used.

Dimension diagrams GM

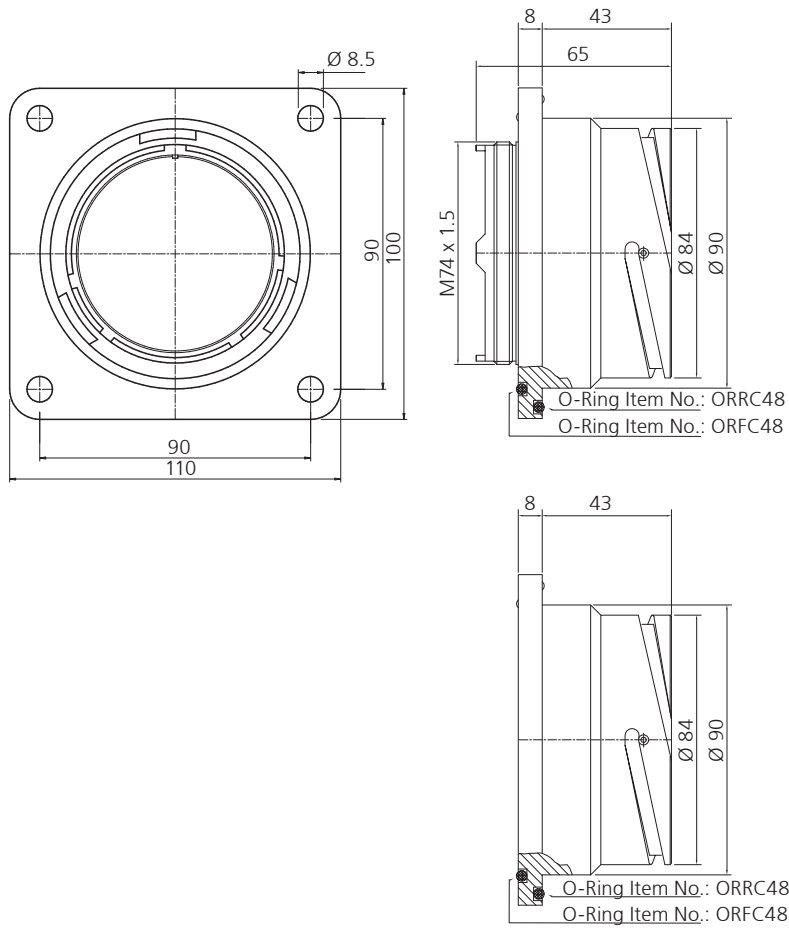
Plug, straight, size 48 for 7 modules, with back shell and cable clamp type C size 40



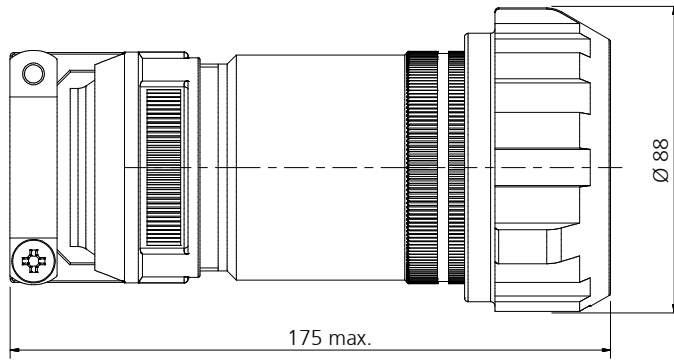
Plug, 90° elbow, size 48 for 7 modules, with elbow back shell for male or female thread adapter



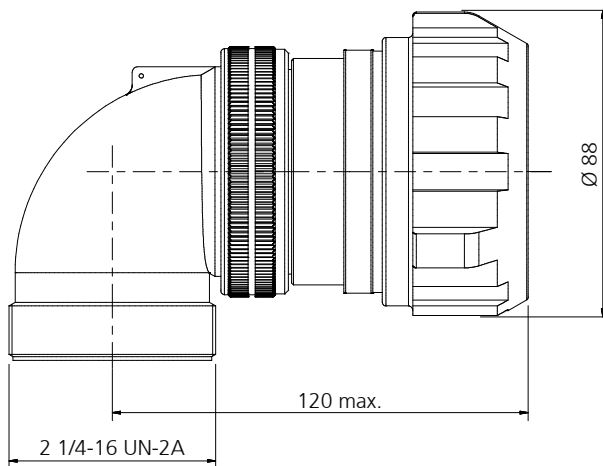
**Receptacle, size 48 for 7 modules, for front - or rear panel mount/
dummy receptacle**

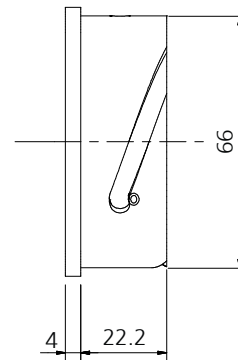
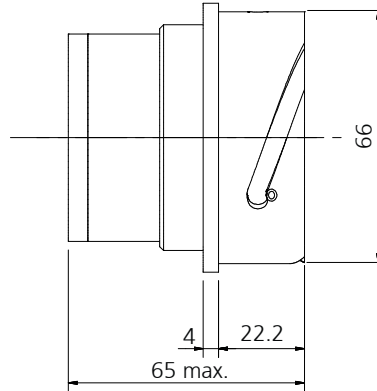
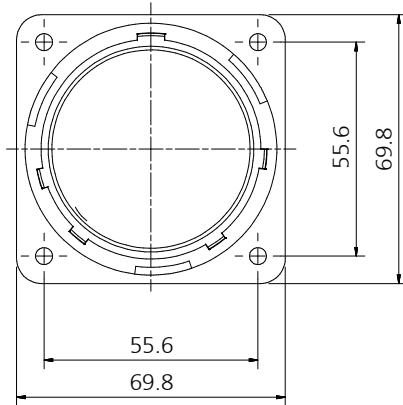


Plug, straight long, size 40 for 4 modules, with back shell and cableclamp type C size 40

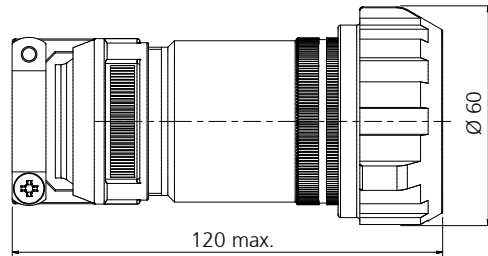


Plug, 90° elbow, size 40 for 4 modules, with elbow back shell

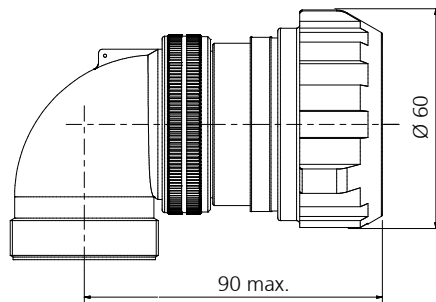


Receptacle, size 40 for 4 modules, for frontpanel mount / dummy receptacle

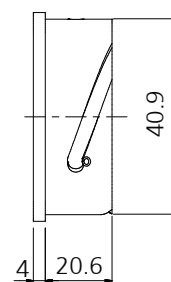
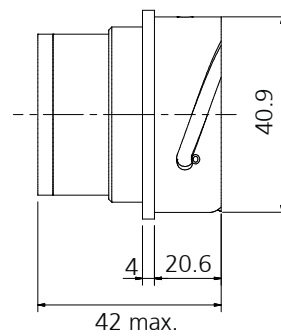
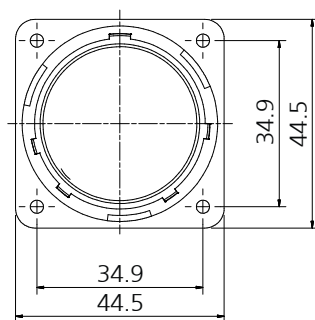
Plug, straight long, size 24 for 1 modul, with back shell and cableclamp type C size 24



Plug, 90° elbow, size 24 for 1 modul, with elbow back shell

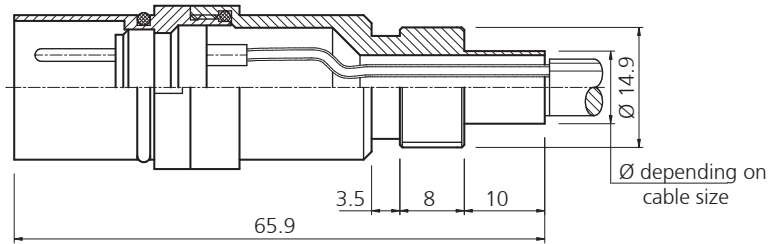


Receptacle, size 24 with 1 modul, for frontpanel mount / dummy receptacle

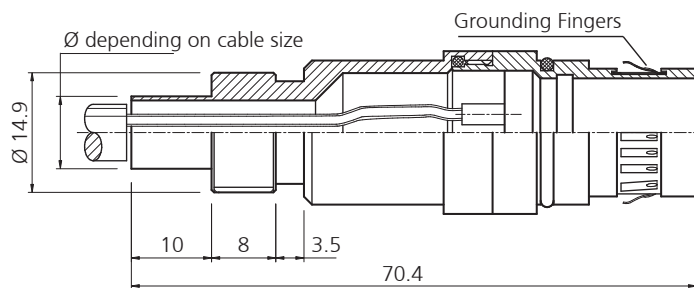


Dimensions of modules

Receptacle module



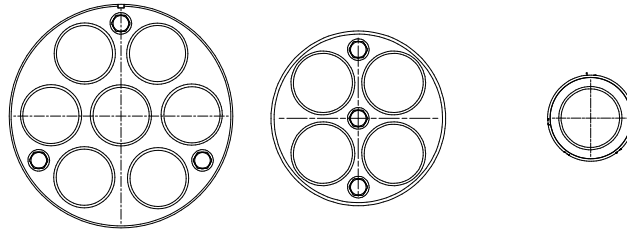
Plug module



6.3.6 Module support and contact inserts

Module support

View to
module support



Layout	48-7	40-4	24-1
No. of modules	7	4	1
Module size	14	14	14

Contact inserts / modules

Front view
to pins



Layout	14S-2 *	14S-5	14S-A7	14SZ-10 **
Number of contacts	4	5	7	10
Size of contacts	16S	16S	16S	20
Voltage-Index ¹⁾	INST	INST	INST	SPEC

* Insert for Ethernet Kat 5

** Insert for Ethernet Kat 6

¹⁾ see 6.3.2

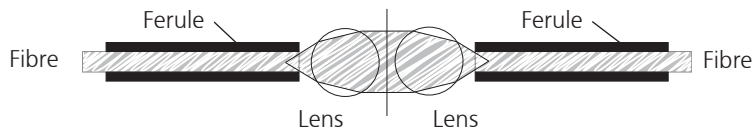
Contact size



6.3.7 Fiberoptic expanded beam modules

Description

Fiber Optic cable systems using Expanded Beam technology are physically expanding the light into an optical beam and are collimating the transmissions signal of approx. 0.5mm diameter. It is then refocused back down to the core of the receiving fiber. This concept provides ease of alignment and low sensitivity of thermal changes and dust contamination.

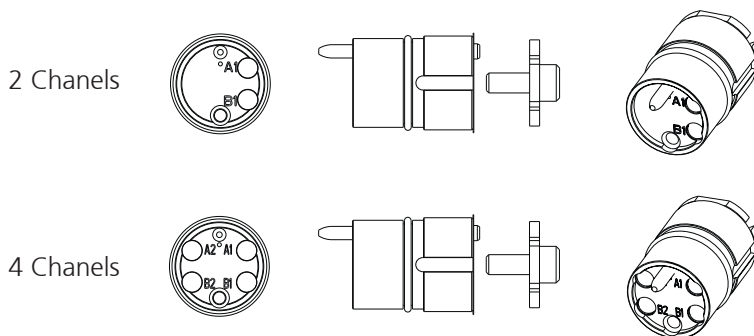


Characteristics

- Non-contacting method of mating optical fibres
- No wear on fiber optic interface
- Highly vibration resistant
- Easy handle, easy to clean, durable connection that is highly resistant to dirt / debris
- Low sensitivity to temperature change and interface contamination
- Available in Single- or Multi-Mode
- Modules with 2 or 4 channels

Perform Specification

- Optical loss multimode: max. 1.0 dB at 1300 nm
- Optical loss singlemode: max. 1.0 dB at 1310 nm
- Reflective loss: 34 dB at 1310 nm oder 1550 nm
- Operation temperature: -40°C / +85°C



Optical Fibre and wavelength

Fibretyp		Wavelength
Multimode	50/125 µm	850 nm
Multimode	50/125 µm	1300 nm
Multimode	62.5/125 µm	850 nm
Multimode	62.5/125 µm	1300 nm
Singlemode	9/125 µm	1310 nm
Singlemode	9/125 µm	1550 nm

6.3.8 Individual parts

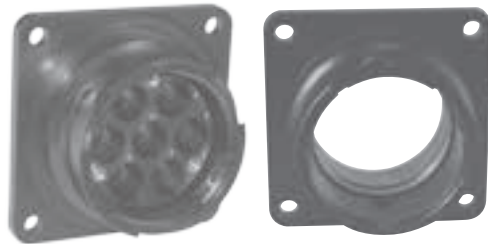
Individual parts for GM size 48 plug / receptacle / accessories


Description

Modular plug size 48, for 7 modules

Item number

GM602-48-7S-TAC


Description

Modular receptacle size 48, for 7 modules

Dummy receptacle, size 48

Item number

GM320-48-7P-TAC

GU400-48-AC


Description

Back shell, straight, with connecting thread size 40

Item number

BSR48-40A-AC-A01


Description

Cable clamp Typ C, size 40

Item number

CC40-AC

**Description**

Back shell, 90° elbow, with connecting thread for adapters

Item number

BEN48-AC

**Description**

Male thread adapter to size 40 for BEN48-AC

Item number

BSX48-40A-AC-A01

**Description**

Female thread adapter M50 x 1.5 mm for BEN48-AC

Item number

BSX48-M7B-AC-A01

**Description**

O-Ring for receptacle at front panel mount; Ø = 88 mm

O-Ring for receptacle at rear panel mount; Ø = 98 mm

Item number

ORFC48

ORRC48

Other components on request

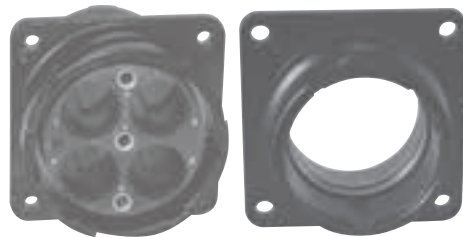
Individual parts for GM 40 plug / receptacles


Description

Modular plug, size 40, for 4 modules

Item number

GM602-40-4S-TAC


Description

Modular receptacle, size 40, for 4 modules

Dummy receptacle, size 40

Item number

GM210-40-4P-TAC

GV400-40-AC


Description

Back shell, straight long, size 40

Item number

BSL-40-AC-A01


Description

Cable clamp typ C, size 40

Item number

CC40-AC

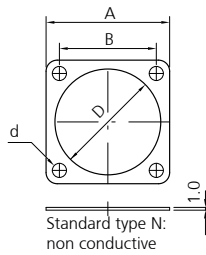


Description

Back shell, 90° elbow,with intermediate back shell

Item number

BEN40-AC-A01



Sealing
 A = 69.9
 B = 55.5
 d = 5.5

Description

Front panel mount, D = 61.9

Rear panel mount, D = 65.5

Item number

10-40450-40

10-40451-40

Other components or request

Optional accessories for size 48 and size 40 connectors

Fig. a)



Fig. b)



Description

Coding pin

Coding screw

Item number

GMCP

GMCL

Fig.

a

b

Individual parts for GM 24 plug / receptacles


Description

Modular plug, size 24, for 1 module

Item number

GM602-24-1S-TAC


Description

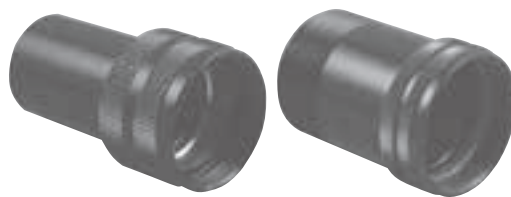
Modular receptacle size 24, for 1 module

Dummy receptacle, size 24

Item number

GM210-24-1P-TAC

GV400-24-AC


Description

Back shell, straight long, size 24, male thread

Back shell, straight long, size 24, female thread M29x1.5

Item number

BSL24-AC

BSL24-M4B-AC


Description

Cable clamp typ C, size 24

Item number

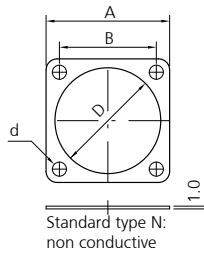
CC24-AC

**Description**

Back shell, 90° elbow, with intermediate back shell

Item number

BEN24-AC-A01



Sealing
 A = 44.5
 B = 34.9
 d = 5.5

Description

Front panel mount, D = 36.0

Rear panel mount, D = 41.8

Item number

10-40450-24

10-40451-24





Other components or request

Individual parts for modules plug / receptacle

Plug module set







Plug module with EMI adapter, shilding sleeve and heatshrinkable shape

Layout	for cables up to Ø 5 mm	for cables up to Ø 6 mm	for cables up to Ø 9 mm
 14S-2	GMM6XE14S-2S-EAE-A05	GMM6XE14S-2S-EAE-A06	GMM6XE14S-2S-EAE-A09
 14S-5	GMM6XE14S-5S-EAE-A05	GMM6XE14S-5S-EAE-A06	GMM6XE14S-5S-EAE-A09
 14S-A7	GMM6XE14S-A7S-EAE-A05	GMM6XE14S-A7S-EAE-A06	GMM6XE14S-A7S-EAE-A09
 14SZ-10	GMM6XE14SZ-10S-EAE-A05	GMM6XE14SZ-10S-EAE-A06	GMM6XE14SZ-10S-EAE-A09

Receptacle module set



Receptacle module with EMI adapter, shilding sleeve and heatshrinkable shape

Layout	for cables up to Ø 5 mm	for cables up to Ø 6 mm	for cables up to Ø 9 mm
 14S-2	GMM1XE14S-2P-EAE-A05	GMM1XE14S-2P-EAE-A06	GMM1XE14S-2P-EAE-A09
 14S-5	GMM1XE14S-5P-EAE-A05	GMM1XE14S-5P-EAE-A06	GMM1XE14S-5P-EAE-A09
 14S-A7	GMM1XE14S-A7P-EAE-A05	GMM1XE14S-A7P-EAE-A06	GMM1XE14S-A7P-EAE-A09
 14SZ-10	GMM1XE14SZ-10P-EAE-A05	GMM1XE14SZ-10P-EAE-A06	GMM1XE14SZ-10P-EAE-A09

Other layouts and configurations on request

Module components



Description	Item number
Plug module 4-poles	GMM6-14S-2S-EAE
Plug module 5-poles	GMM6-14S-5S-EAE
Plug module 7-poles	GMM6-14SA-7S-EAE
Plug module 10-poles	GMM6-14SZ-10S-EAE



Description	Item number
Receptacle module 4-poles	GMM1-14S-2P-EAE
Receptacle module 5-poles	GMM1-14S-5P-EAE
Receptacle module 7-poles	GMM1-14SA-7P-EAE
Receptacle module 10-poles	GMM1-14SZ-10P-EAE



Description	Item number
EMI adapter wire entry $\varnothing \leq 5$ mm	EC-14-05-AE-A01
EMI adapter wire entry $\varnothing \leq 6$ mm	EC-14-06-AE-A01
EMI adapter wire entry $\varnothing \leq 9$ mm	EC-14-09-AE-A01



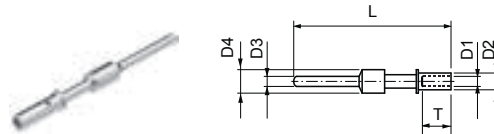
Description	Item number
Shielding sleeve for EMI adapter EC-14-05-AE-A01	SUGSC297
Shielding sleeve for EMI adapter EC-14-06-AE-A01	SUGSC359
Shielding sleeve for EMI adapter EC-14-09-AE-A01	SUGSC500



Description	Item number
Heatshrinkable shape to adapter EC-14-05-AE-A01 / EC-14-06-AE-A01	FTH08-04
Heatshrinkable shape to adapter EC-14-09-AE-A01	FTH11-06

6.3.9 Contacts

The given cross sections and AWG sizes are reference values and based on market available wires and conductors that have been pressed with GIMOTA-crimping tools. Individual qualification testing by the user is recommended.



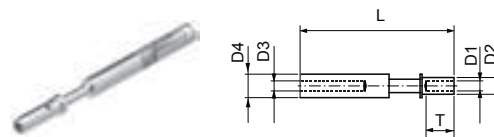
Material Pin contact

Contact material: Cu alloy

Contact surface: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni

Electrical properties see 6.3.2

Contact size	Conductor		strip-ping	D1 ± 0.05	D2 ± 0.1	D3 ± 0.05	D4 ± 0.1	T ± 0.5	L ± 1.0	Item number
	mm ²	AWG								
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40553-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40553 AU
20	0.5	22-18	4.5	1.30	1.90	1.0	2.0	4.3	20.4	10-40549-05 AU



Material Socket contact

Contact material: Cu alloy

Contact surface: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni

Electrical properties see 6.3.2

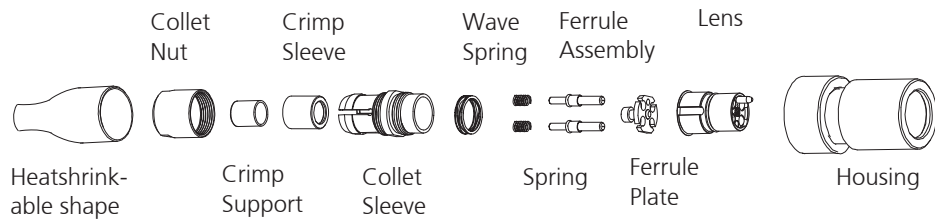
Contact size	Conductor		strip-ping	D1 ± 0.05	D2 ± 0.1	D3 ± 0.05	D4 ± 0.1	T ± 0.5	L ± 1.0	Item number
	mm ²	AWG								
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40552-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40552 AU
20	0.5	22-18	4.5	1.30	1.90	1.15	2.0	4.3	20.2	10-40548-05 AU

Filler plugs for contact cavity size 16S see chapter 5.1.2.

Filler plugs for contact cavity size 20, on request.

6.3.10 Optical Modules

Expanded Beam (EB)



Description	Item number
Plug module, with heatshrinkable shape 2-channel, multimode	GMM6XO14O-2M
Plug module, with heatshrinkable shape 4-channel, multimode	GMM6XO14O-4M
Plug module, with heatshrinkable shape 2-channel, singlemode	GMM6XO-14O-2S
Plug module, with heatshrinkable shape 4-channel, singlemode	GMM6XO-14O-4S



Description	Item number
Receptacle module, with heatshrinkable shape 2-channel, multimode	GMM1XO14O-2M
Receptacle module, with heatshrinkable shape 4-channel, multimode	GMM1XO14O-4M
Receptacle module, with heatshrinkable shape 2-channel, singlemode	GMM1XO14O-2S
Receptacle module, with heatshrinkable shape 4-channel, singlemode	GMM1XO14O-4S

For assembling and instructions for optical modules, please contact GIMOTA INC

SC butt-joint module (for SC butt-joint-contacts)



Description	Item number
Plug module for 3 SC-contacts	GMM6XOOSC-3-T



Description	Item number
Receptacle module for 3 SC-contacts	GMM1XOOSC-3-T

For assembling and instructions for optical modules, please contact GIMOTA INC

6.3.11 Assembling tools

Assembling tool for GM plug / receptacle



Description	Item number
Module extraction tool from GM plugs / receptacles	WMA

Assembling tool for GM modules



Description	Item number
Assembling receptacle for GM modules	WSMM14

Press tool for shielding sleeves



Mechanical press tool with exchangeable dies for different shielding sleeve sizes. One-way ratchet action ensures complete and precise compression with automatic releases and completion of the pressing cycle.

Dimensions: 270 mm x 80 mm
Weight: 0.7 kg

Shielding sleeve	Item number Tool	Item number Die
SUGSC297	GIW30L	GIM30K06
SUGSC359	GIW30L	GIM30K09
SUGSC500	GIW30L	GIM30S12

Press tool for contacts



Mechanical press tool with exchangeable press-head dies for various contacts and wire cross sections. One-way ratchet action ensures complete and precise compression with automatic release at completion of the pressing cycle.

Dimensions: 200 mm x 65 mm
Weight: 0.3 kg (incl. press-head die)

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
16S	0.25-0.5	20	GIW10V	GIM10V16/0.25-1.5
16S	0.75-1.5	18-15	GIW10V	GIM10V16/0.25-1.5
20	0.5	20	GIW10V	GIM10V20/0.5

Insertion tool for contacts

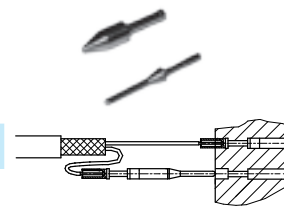


Contact size	Cross-section		Item number Insertion tool
	mm ²	AWG	
16S	0.5-0.75	20	WMK0 GR16/0.5 – 0.75
16S	1.0-1.5	18-15	WMK0 GR16/1.0 – 1.5 GR12/0.5
20	0.5	20	WMK0 GR20/0.5

Location pin for contacts

For simplified and secure application of socket contacts into the contact insert

Contact size	Item number location pin
16	WMP0K16
20	WMP0K20



Extraction tool for contacts

The inserts can be stored in the handle.

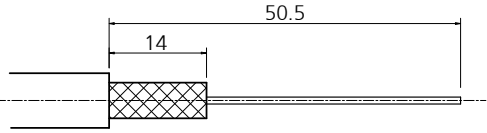



Contact size	Cross-section	Item number Handle	Item number Insert
16/16S	Socket	WML0	WML0 BU GR16
16/16S	Pin	WML0	WML0 STI GR16
20	Socket	WML0	WML0 BU GR20
20	Pin	WML0	WML0 ST GR20



6.3.12 Assembling instructions

Module assembling

Relevant assembling tools are mentioned in chapter 6.3.11.

<p>Strip cable</p> 	<p>General stripping lengths for plugs/receptacles. Exact dimensions have to be defined occasionally.</p>
<p>Crimp contacts</p> 	<p>Crimp contacts to the wires. See crimping tools.</p>
	<p>Push the heatshrinkable shape, the shielding sleeve and the adapter onto the cable.</p>
	<p>Push the contacts into the contact-insert. See inserti on tool.</p>

Close up the module



Screw the module together.
Caution: *the module must be fully closed.*
See assembling tool.

Crimp the screen



Apply the screen equally around the adapter.



Push the shielding sleeve over the screen on to the adapter.



Compress the shielding sleeve (Hexagon compression).
See press tools

Fit the heat-shrinkable sleeve



Apply heatshrinkable shape with an appropriate heat-gun.

Assembling of plug/receptacle

Engage the modules with in the foreseen cavities



Every module has a guiding groove. The module carrier is marked for easy pre-alignment of the modules at the application.



If pushing the pre-aligned module into the cavity to the end a clicking sound indicate proper alignment and locking in place. Slightly pull the cable to check if the module is locked correctly.

Screw the plug together



The plug has an interlock to allow an individual positioning of the cable entry direction if using an 90° elbow back-shell.

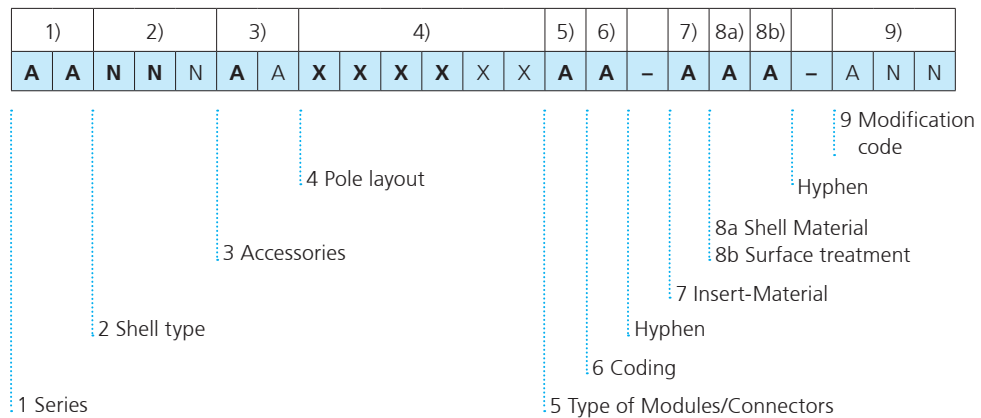


If applying a 90° elbow backshell the interlock has to mate properly and the swivel nut need to be firmly tightend.

6.3.13 Numbering key for modular connectors

Explanation of numbering key

Plugs and receptacles – example



Explanations and indications

<p>A, A Capital letter</p> <p>N, N Numeral</p> <p>X, X Numeral, Capital letter, or Hyphen</p>	<p>bold: Must be specified</p> <p>normal: Specify if requested.</p> <p>No spacing!</p>
--	--

Allocation of codes for modular plugs / receptacles

- | | |
|---|--|
| <p>1 Series:</p> <p>GM Gimota modular bayonet plug with 5 guiding keys, circular spring in bayonet ring.</p> <p>2 Shell type:</p> <p>2.1 Plug without accessory:</p> <p>60 Connector</p> <p>2.2 Plug with accessory:</p> <p>06 Straight plug</p> <p>08 90° elbow</p> <p>a) <i>Additional codes for plugs:</i></p> <p>2 Rubber coated bayonet ring</p> <p>2.3 Receptacle without accessory:</p> <p>21 Front panel mount receptacle with accessory-thread</p> <p>32 Receptacle, rear panel flange, accessory thread + interlock</p> <p>40 Front panel mount dummy receptacle</p> <p>2.4 Receptacle with accessory:</p> <p>26 Straight receptacle, front panel mount</p> <p>36 Straight receptacle, rear panel mount</p> <p>38 90° receptacle</p> | <p>b) <i>Additional codes for receptacles</i></p> <p>0 Through-fixing holes</p> <p>1 Threaded, holes fixing</p> <p>3 Accessory:</p> <p>- if no accessory = insert hyphen</p> <p>SA with back shell only</p> <p>SB Back shell and metallic cable clamp type C</p> <p>XG Back shell with female thread „M“</p> <p>4 Layout:</p> <p>24-1</p> <p>40-4</p> <p>48-7</p> <p>5 Type of module:</p> <p>P Receptacle module</p> <p>S Plug module</p> <p>7 Module insert material</p> <p>T Thermoplastic</p> <p>8a Shell material:</p> <p>A Aluminium alloy</p> <p>8b Surface treatment:</p> <p>C Polyurethane varnished, black</p> |
|---|--|

Allocation of codes for modules (plugs/receptacles)

- | | |
|--|---|
| <p>1 Series:
 GM Gimota Modular</p> <p>2 Shell type:
 M1 Receptacle module
 M6 Plug module</p> <p>3 Accessories:
 – if no accessories = insert hyphen
 XE EMI-shielding back shell for heat-shrinkable sleeve
 XO Optical module</p> <p>4 Layout:
 <i>Electrical</i>
 Complete identification of the selected pole layout:
 14S-5 / 14SA-7 / 14S-2 / 14SZ-10
 <i>Optical EB</i>
 14O-2M / 14O-4M / 14O-2S / 14O-4S
 <i>Optical SC</i>
 OSC-3-T</p> | <p>5 to 8b for electrical modules only</p> <p>5 Type of contact:
 P Pin contacts
 S Socket contacts</p> <p>7 Insert Material:
 E Ethylene acrylate GXF</p> <p>8a Shell Material:
 A Aluminium alloy</p> <p>8b Surface treatment:
 E Electroless Nickel [<i>conductivee, RoHS</i>]</p> <p>Modification code:
 A05 Crimp adapter EC-14-05-AE-A01
 int. Ø = 5mm incl. shielding sleeve and heatshrinkable shape.
 A06 Crimp adapter EC-14-06-AE-A01
 int. Ø = 6mm incl. shielding sleeve and heatshrinkable shape.
 A09 Crimp adapter EC-14-09-AE-A01
 int. Ø = 9mm incl. shielding sleeve and heatshrinkable shape.</p> |
|--|---|

Modification code will be given by Gimota INC. only.

6.4 GB series connectors with EMI shielding (for data and signal cables at outdoor applications)

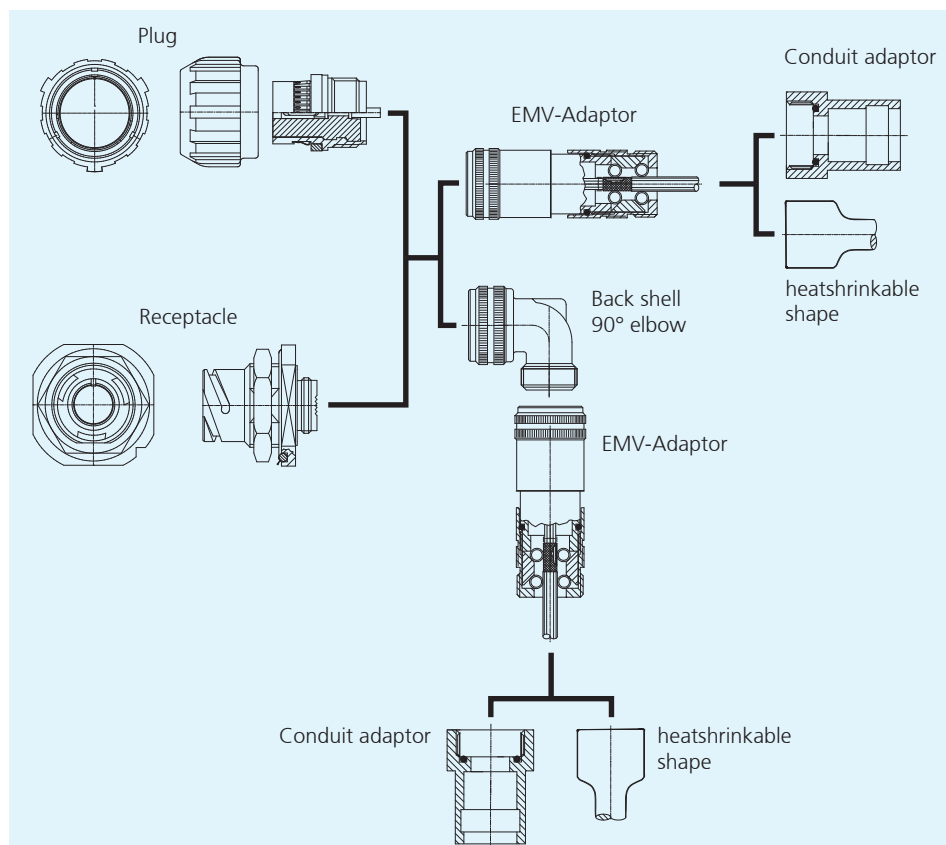
6.4.1 Introduction

General introduction

Description

This Series of circular connectors for data and signal transfer is available in of size 14S, with 4, 5, 7, or 10-pole contact inserts, including bayonet couplings for outdoor use and an EMI adapter with a built-in cable strain relief. The EMI adapter features an "IRIS spring" system that ensures optimal 360° screen contact and strain relief for cable diameters between 4 and 12 mm. The EMI adapter can be used in conjunction with an adapter for NW07 / NW10 / NW12, or with heatshrinkable shapes.

Arrangement:



Material

The shell is made of aluminium alloy, with a conductive, black zinc-cobalt surface coating. The contact insert and the bayonet ring coating are made of ethylene acrylate and comply with the relevant fire protection standards (flame retardant, halogen-free). The connectors are RoHS-compliant.

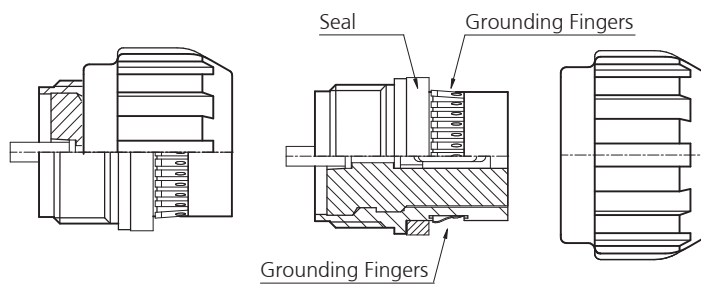
Watertightness

The connectors comply with ingress protection class IP68 according to IEC EN 60529 and IP69K according to DIN 40050. An O-ring can be applied to the jam nut receptacle flange at mounting. This ensure a watertight seal between the receptacle flange and the mounting panel surface.

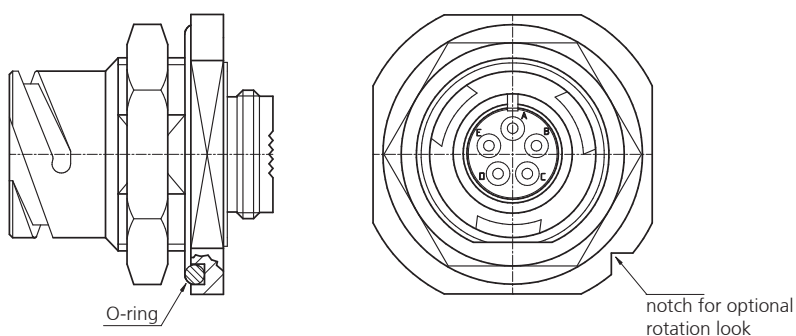
EMI-shielding

The EMI shielding of the plug is ensured by grounding fingers, for a optimal 360° screen adaption. Shielding current will be transfered over the connector housing.

Plug:



Jam nut receptacle:



Dimensions

Unless otherwise stated, all dimensions are mentioned in millimeters.

6.4.2 Electrical properties

All electrical data are stated at sea level and at standard temperature of 20 °C.
Deviating environment conditions have to be considered for plug evaluation.

Plugs / receptacles

Voltage-Index						Insulation		
[-]		Operating voltage		Test voltage	Flash-over	Creepage distance	CTI value	Isulation resistance
		DC	AC					
		[V]	[V]	[VAC]	[VAC]	≥[mm]	IEC60664	[MΩ]
INST	MIL	250	200	1000	1400	1.6	≥ 300	≥ 5000
SPEC.	---	750	600	1500	---	---	---	≥ 5000

MIL: Requirements acc. to MIL-DTL-5015:
Values indicated on table above are applicable only if adequate safety measures are taken. That means the connection area of plug / Receptacle must be protected completely against pollution and humidity by an adequate cable clamp. Without safety precautions the operating voltage to grounding must not exceed 50 V.

Contacts

Size of contacts			165	20
Nominal current	continuous	[A]	13	7.5
Maximum current	short term	[A]	22	7.5
Test current		[A]	20	9
Contact resistance ¹⁾		[mΩ]	≤ 6.0	≤ 10

¹⁾ Verification according VG95234 / 2 / Test 5.10.1 and VG95210 / 37

6.4.3 Mechanical properties

Connectors

Bayonet coupling - torque ¹⁾

Connector Size			145
to lock	max.	[Nm]	1.8
to open	min.	[Nm]	0.55
	max.	[Nm]	1.8

¹⁾ Verification according to VG95319 / 2 / Test 5.8.2

Contacts

Size of contacts			165	20
Contact material			copper alloy	copper alloy
Gold plated: 0.5 µm Au over 2.5 µm Ni			x	x
Silver plated: 3.5 µm Ag			o	o
Contact mating force ¹⁾	nom.	[N]	5	1.8
Contact separating force	nom.	[N]	1	0.3

Plating on contact area: **x** = standard, **o** = on request

¹⁾ Verification according to VG95319 / 2 / Test 5.4 and 5.7

Shell parts

Surface treatment	zinc-cobalt, black
Surface code	A
Base material	aluminium alloy
Thickness of protective layer	12 – 15 µm
Colour	black
Corrosion resistance ¹⁾	200 h
Operating temperature	–55 to +90°C
Electrical conductivity ²⁾	≤ 0.5 mΩ

¹⁾ Verification according to MIL 1344A Test 1001.1

²⁾ Verification according to MIL 1344A Test 3007

6.4.4 Thermal properties / Fire characteristic

Contact inserts

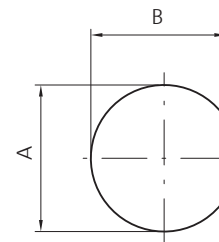
Material-Code	E
Material	ethylene acrylate GXF
Operating temperature	-55 to +125 °C
Fire protection class UL94	V0 ¹⁾
Fire protection class NFF16-101/102	I3/F0
Fire protection class DIN5510	S4 / SR2 / ST2

¹⁾ flame retardant, halogen-free

6.4.5 Dimensions

Panel cut out

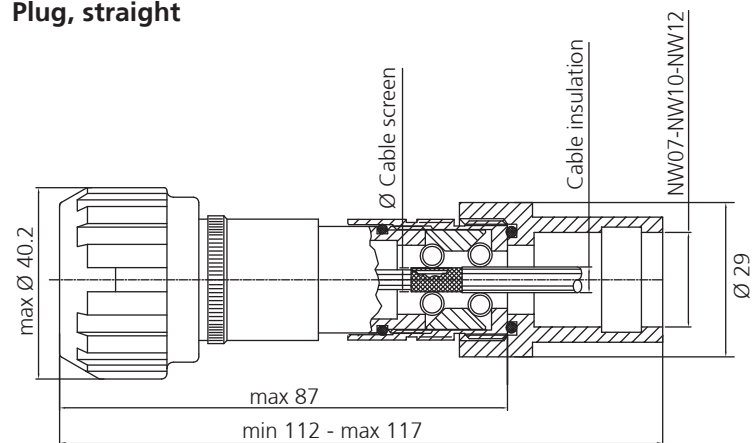
for jam nut receptacles



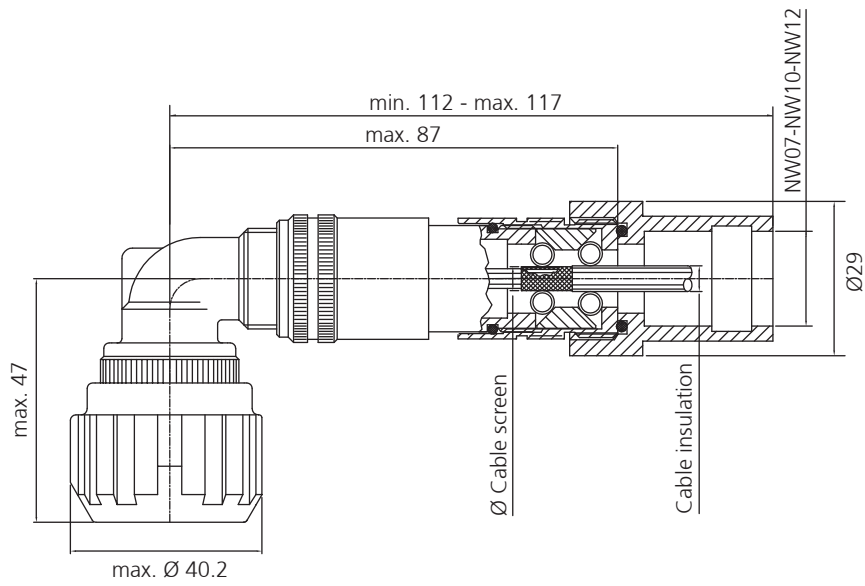
Size	A	B	Panel thickness min.	Panel thickness max.
14S	+0.25 / -0	+0 / -0.35	2.4	7.5

Dimensions Sensor connector

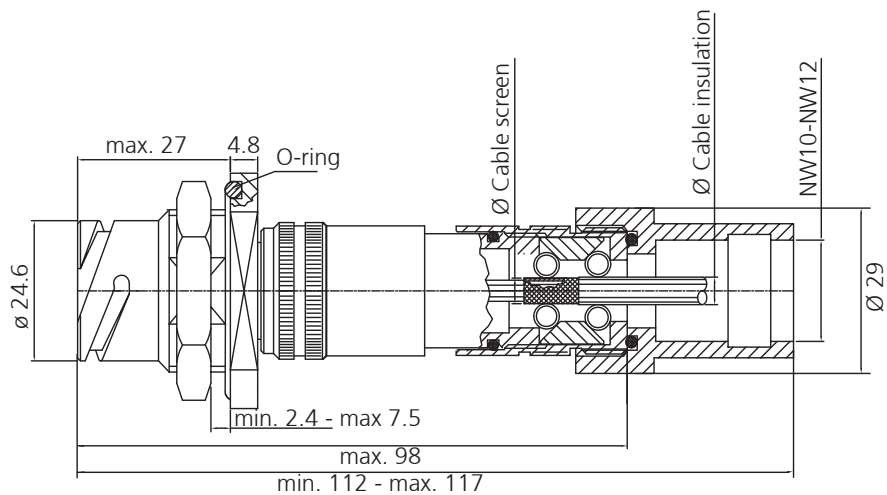
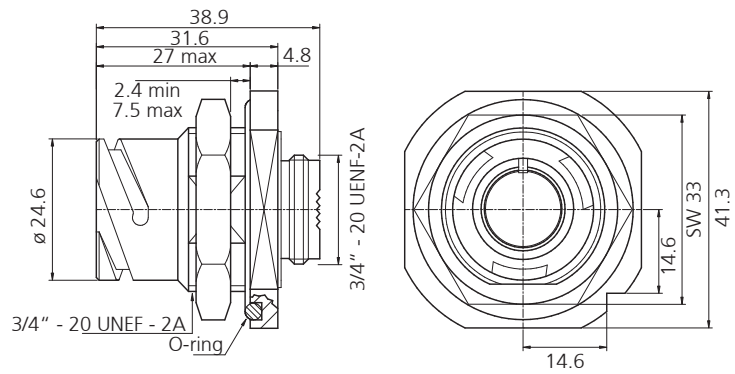
Plug, straight



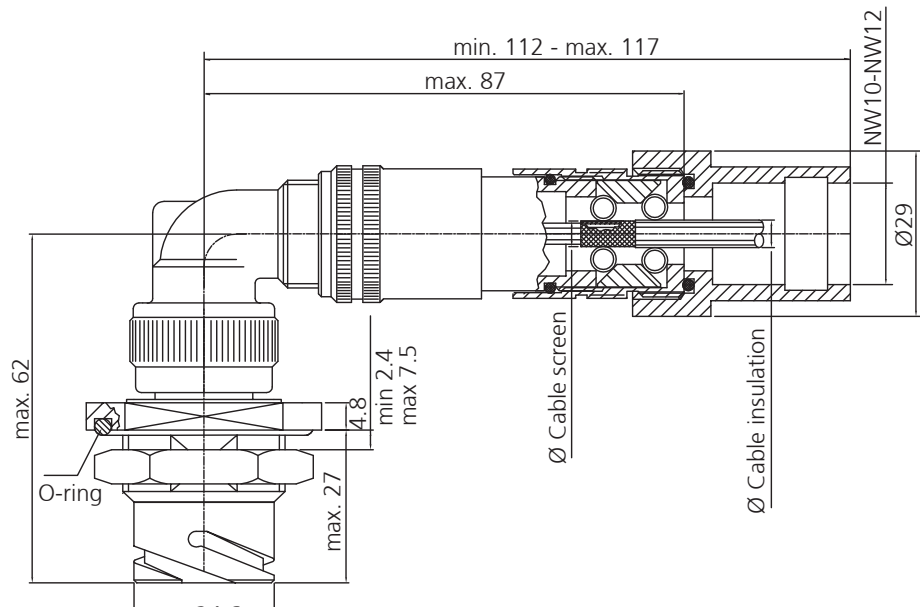
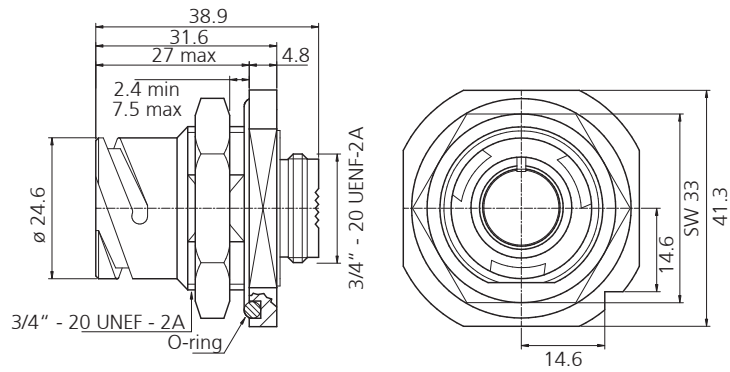
Plug, 90° elbow



Receptacle, straight with jam nut



Receptacle, 90° elbow



6.4.6 Contact inserts - overview

Front view
to pins



Layout	14S-2 *	14S-5	14S-A7	14SZ-10 **
Number of contacts	4	5	7	10
Size of contacts	16S	16S	16S	20
Voltage Index ¹⁾	INST	INST	INST	SPEC
Grommet	x	x	o	o

* Insert for Ethernet cat 5

** Insert for Ethernet cat 6

x = Grommet standard

o = for grommet ask GIMOTA

¹⁾ See 6.4.2

Contact size

o ●
20 16

6.4.7 Individual parts

Plug



Plug size 14S with
pin contact insert

Plug size 14S with
socket contact insert

Size	No. of contacts	Type of contacts	Item number
14S	4	pin	GB604-14S-2PN-EAA
14S	5	pin	GB604-14S-5PN-EAA
14S	7	pin	GB604-14S-A7PN-EAA
14S	10	pin	GB604-14SZ-10PN-EAA
14S	4	socket	GB604-14S-2SN-EAA
14S	5	socket	GB604-14S-5SN-EAA
14S	7	socket	GB604-14S-A7SN-EAA
14S	10	socket	GB604-14SZ-10SN-EAA

Receptacle

including jam nut and O-ring seal



Receptacle size
14S with pin
contact insert

Receptacle size
14S with
socket contact insert

Size	No. of contacts	Type of contacts	Item number
14S	4	pin	GB72-14S-2PN-EAA
14S	5	pin	GB72-14S-5PN-EAA
14S	7	pin	GB72-14S-A7PN-EAA
14S	10	pin	GB72-14SZ-10PN-EAA
14S	4	socket	GB72-14S-2SN-EAA
14S	5	socket	GB72-14S-5SN-EAA
14S	7	socket	GB72-14S-A7SN-EAA
14S	10	socket	GB72-14SZ-10SN-EAA

Back shell, 90° elbow



Description	Item number
Back shell, 90° elbow	BEN14-AA

EMI adapter



Description	Item number
EMI adapter for corrugated conduit adapter Ø cable screen (4-7mm), Ø cable isolation (4-8mm)	EII14S-04-AA
EMI adapter for corrugated conduit adapter Ø cable screen (4-7mm), Ø cable isolation (5-10mm)	EII14S-05-AA
EMI adapter for heatshrinkable shape Ø cable screen (4-7mm), Ø cable isolation (8.5-13.5mm)	EII14S-09-AA

Corrugated conduit adapter



Description	Item number
Adapter to corrugated conduit NW07	BVIVG-U21M
Adapter to corrugated conduit NW10	BVIVG-U210
Adapter to corrugated conduit NW12	BVIVG-U212

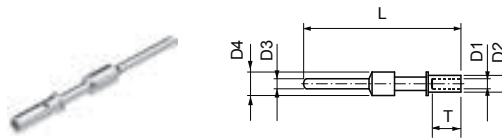
Heatshrinkable shape



Description	Item number
Heatshrinkable shape Ø expanded: 30 mm, Ø recoverd: 14 mm/6 mm	FTH14-06

6.4.8 Contacts

The given cross sections and AWG sizes are reference values and based on market available wires and conductors that have been pressed with GIMOTA-crimping tools. Individual qualification testing by the user is recommended.



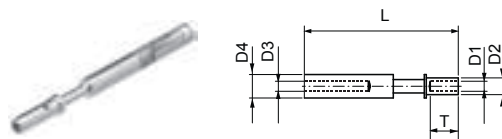
Material Pin contact

Contact material: Cu alloy

Contact surface: **AU** = gold plated: min. 0.5 μm over 2.5 μm Ni

Electrical properties see 6.4.2

Contact size	Conductor		strip-ping	D1 ± 0.05	D2 ± 0.1	D3 ± 0.05	D4 ± 0.1	T ± 0.5	L ± 1.0	Item number
	mm ²	AWG								
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40553-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40553 AU
20	0.5	22-18	4.5	1.30	1.90	1.0	2.0	4.3	20.4	10-40549-05 AU



Material Socket contact

Contact material: Cu alloy

Contact surface: **AU** = gold plated: min. 0.5 μm over 2.5 μm Ni

Electrical properties see 6.4.2

Contact size	Conductor		strip-ping	D1 ± 0.05	D2 ± 0.1	D3 ± 0.05	D4 ± 0.1	T ± 0.5	L ± 1.0	Item number
	mm ²	AWG								
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40552-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40552 AU
20	0.5	22-18	4.5	1.30	1.90	1.15	2.0	4.3	20.2	10-40548-05 AU

Filler plugs for contact cavity size 16S see chapter 5.1.2.
Filler plugs for contact cavity size 20, on request.

6.4.9 Assembling tools

Assembling receptacle



Description	Item number
Assembling receptacle for plug	WSM14

Press tool for contacts

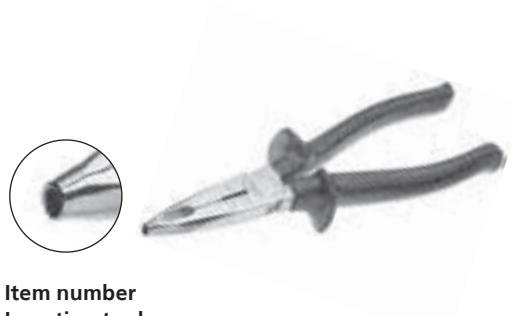


Mechanical press tool with exchangeable press-head dies for various contacts and wire cross sections. One-way ratchet action ensures complete and precise compression with automatic release at completion of the pressing cycle.

Dimensions: 200 mm x 65 mm
Weight: 0.3 kg (incl. press-head die)

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
16S	0.25-0.5	20	GIW10V	GIM10V16/0.25-1.5
16S	0.75-1.5	18-15	GIW10V	GIM10V16/0.25-1.5
20	0.5	20	GIW10V	GIM10V20/0.5

Insertion tool for contacts

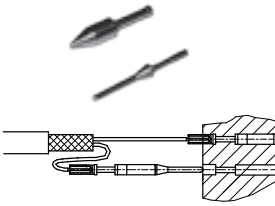


Contact size	Cross-section		Item number Insertion tool
	mm ²	AWG	
16S	0.5-0.75	20	WMK0 GR16/0.5 – 0.75
16S	1.0-1.5	18-15	WMK0 GR16/1.0 – 1.5 GR12/0.5
20	0.5	20	WMK0 GR20/0.5

Location pin for contacts

For simplified and secure application of socket contacts into the contact insert.

Contact size	Item number location pin
16	WMP0K16
20	WMP0K20



Extraction tool for contacts

The inserts can be stored in the handle.

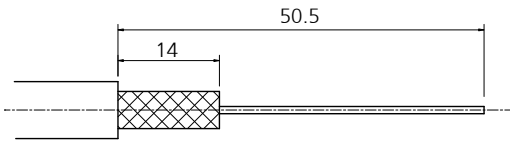





Contact size	Cross-section	Item number Handle	Item number Insert
16/16S	Socket	WML0	WML0 BU GR16
16/16S	Pin	WML0	WML0 STI GR16
20	Socket	WML0	WML0 BU GR20
20	Pin	WML0	WML0 ST GR20

6.4.10 Assembling instructions

Assembling instructions for sensor connectors

Relevant assembling tools are mentioned in chapter 6.4.9.

<p>Strip cable</p> 	<p>General stripping lengths for plugs/receptacle straight version. Exact stripping dimensions have to be define occasionally.</p>
<p>Prepare the screen</p> 	<p>Apply the supporting sleeve over the conductors and under neath the screening braid.</p>
<p>Assembly and press contacts</p> 	<p>Push the heatshrinkable shape or conduit adapter and the EMI adapter onto the cable.*</p> <p>Crimp contacts on the wires see crimping tools.</p> <p>* If using a 90° elbow back shell it also has to be pushed onto the cabel.</p>
	<p>Push the contacts into the contact insert. See insertion tool.</p>



Screw the front part of the adapter onto the connector. If a 90° elbow back shell is used it has to be mounted before applying the adapter.

Important: *position the iris spring at the supporting sleeve onto the screen.*

Screw the rear EMI part with double cone bushing to the front part. This presses the two iris springs firmly to the screen and the cable insulation respectively.



An assembly receptacle shall be used to apply the EMI adapter firmly tight.

See assembling receptacle.



Apply heatshrinkable shape with an appropriate heat-gun or use suitable conduit adapter.

6.4.11 Numbering key

Explanation of numbering key

Plugs and receptacles – example

1)	2)			3)		4)						5)	6)		7)	8a)	8b)		9)			
A	A	N	N	N	A	A	X	X	X	X	X	X	A	A	-	A	A	A	-	A	N	N

1 Series
 2 Shell Type
 3 Accessories
 4 Pole layout
 5 Type of contact
 6 Coding
 7 Insert-Material
 Hyphen
 8a Shell Material
 8b Surface treatment
 Hyphen
 9 Modification code

Explanations and indications

A, A	Capital letter	bold:	Must be specified
N, N	Numeral	normal:	Specify if requested.
X, X	Numeral, Capital letter, or Hyphen		No spaces!

Allocation of codes

- | | |
|--|--|
| <p>1 Series:
 GB bayonet connector with 1 guidingkey, press-in contacts</p> <p>2 Shell type:
 2.1 Plug without accessory:
 60 plug</p> <p>2.2 Plug with accessory:
 06 Straight plug
 08 90° elbow
 a) <i>Additional codes for plugs</i>
 4 Rubber coated bayonet ring + EMI</p> <p>2.3 Receptacle without accessory:
 72 Jam nut receptacle, with accessory thread + interlock</p> <p>2.3 Receptacle with accessory:
 76 Jam nut receptacle, straight, suitable for EMI use
 78 Jam nut receptacle, 90° elbow, interlock, suitable for EMI use</p> <p>3 Accessory:
 X <i>With special back shell</i>
 XL EMI shilding adapter with IRIS-spring and strain relief.</p> <p>4 Layout:
 14S-2 4-pole
 14S-5 5-pole
 14S-A7 7-pole
 14SZ-10 10-pole</p> | <p>5 Type of contact:
 P Pin contacts
 S Socket contacts</p> <p>6 Coding:
 N No coding</p> <p>7 Insert Material
 E Ethylene acrylate GXF</p> <p>8a Shell parts material:
 A Aluminium alloy</p> <p>8b Surface treatment:
 A Zinc-cobalt, black [<i>conductivee, RoHS</i>]</p> <p>9 Modification code:
 A10: <i>E114S-04-AA</i> EMI adapter for 4-7mm cable for conduit adapter
 A20: <i>E114S-05-AA</i> EMI adapter for 5-10mm cable for conduit adapter
 A30: <i>E114S-09-AA</i> EMI adapter for 8.5-13.5mm cable for heat-shrinkable shape
 A11: A10 with PMA <i>BVIVG-U21M</i> (NW07)
 A12: A10 with PMA <i>BVIVG-U210</i> (NW10)
 A13: A10 with PMA <i>BVIVG-U212</i> (NW12)
 A22: A20 with PMA <i>BVIVG-U210</i> (NW10)
 A23: A20 with PMA <i>BVIVG-U212</i> (NW12)
 A31: A30 with heatshrinkable shape
 A33: A30 with PMA (NW12)</p> |
|--|--|

6.5 GB series connectors with EMI shielding (for data and signal cables at indoor applications)

6.5.1 Introduction

General introduction

Description

This series of circular connectors for data and signal transfer is available in size 14S, with 4, 5, 7 or 10-pole contact inserts, bayonet couplings for indoor use (eg. in traction converters) and a crimp EMI adapter. The EMI adapter is accomplished with a heatshrinkable shape for sealing and strain relief at the cable.

Material

The shell is made of aluminium alloy with a conductive electroless nickel surface coating. The contact insert is ethylene acrylate GFX and comply with the relevant fire protection standards (flame retardant, halogen-free). The connectors are RoHS-compliant.

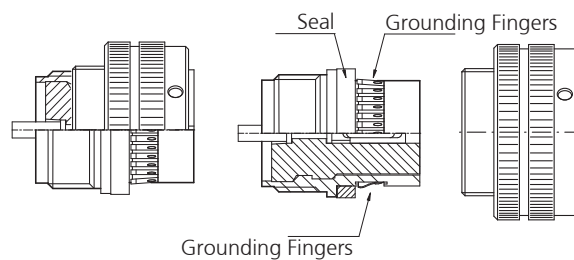
Watertightness

The connectors comply with protection IP68 according to IEC EN 60529 and IP69K according to DIN 40050. Appropriate sealing gaskets for receptacles with EMI (IP65) see 5.4.1.

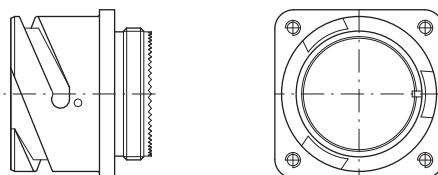
EMI screen

The EMI shielding of the plug is ensured by grounding fingers, for an optimal 360° screen adaption. Shielding current will be transferred over the connector housing. The screen is 360° crimped to the adapter with a shielding sleeve.

Plug:



Receptacle:



Dimensions

Unless otherwise stated, all dimensions are mentioned in millimeters.

6.5.2 Electrical properties

All electrical data are stated at sea level and at standard temperature of 20 °C. Deviating environment conditions have to be considered for plug evaluation.

Plugs / receptacles

Voltages						Insulation		
Voltage-Index		Operating voltage		Test voltage	Flash-over	Creepage distance	CTI value	Isulation resistance
		DC	AC					
[-]		[V]	[V]	[VAC]	[VAC]	≥[mm]	IEC60664	[MΩ]
INST	MIL	250	200	1000	1400	1.6	≥ 300	≥ 5000
SPEC.	---	750	600	1500	---	---	---	≥ 5000

MIL: Requirements acc. to MIL-DTL-5015:
 Values indicated on table above are applicable only if adequate safety measures are taken. That means the connection area of plug / Receptacle must be protected completely against pollution and humidity by an adequate cable clamp. Without safety precautions the operating voltage to grounding must not exceed 50 V.

Contacts

Size of contacts			16S	20
Nominal current	continuous	[A]	13	7.5
Maximum current	short term	[A]	22	7.5
Test current		[A]	20	7.5
Contact resistance ¹⁾		[mΩ]	≤ 6.0	≤ 10

¹⁾ Verification according VG95234 / 2 / Test 5.10.1 and VG95210 / 37

6.5.3 Mechanical properties

Connector

Bayonet coupling - torque ¹⁾

Connector size			145
to lock	max.	[Nm]	1.8
to open	min.	[Nm]	0.55
	max.	[Nm]	1.8

¹⁾ Verification according to VG95319 / 2 / Test 5.8.2

Contacts

Size of contacts			165	20
Contact material			copper alloy	copper alloy
Gold plated: 0.5 µm Au over 2.5 µm Ni			x	x
Silver plated: 3.5 µm Ag			o	o
Contact mating force ¹⁾	nom.	[N]	5	1.8
Contact separating force	nom.	[N]	1	0.3

Plating on contact area: **x** = standard, **o** = on request

¹⁾ Verification according to VG95319 / 2 / Test 5.4 and 5.7

Shell parts

Surface treatment	electroless nickel
Surface code	E
Base material	aluminium alloy
Thickness of protective layer	12 –15 µm
Colour	blank
Corrosion resistance ¹⁾	48 h
Operating temperature	–55 to + 125 °C
Electrical conductivity ²⁾	≤ 0.5 mΩ

¹⁾ Verification acc. to MIL 1344A Test 1001.1

²⁾ Verification acc. to MIL 1344A Test 3007 (Electric Conductivity: Screen-Plug-Receptacle-Panel)

6.5.4 Thermal properties / Fire characteristic

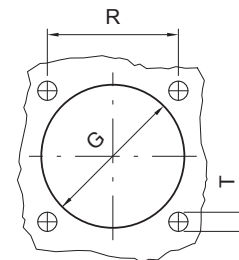
Contact insert

Material-code	E
Material	ethylene acrylate GXF
Operating temperature	-55 to +125 °C
Fire protection class UL	V0 ¹⁾
Fire protection class NFF16-101/102	I3/F0
Fire protection class DIN5510	S4/SR2/ST2

¹⁾ flame retardant, halogen-free

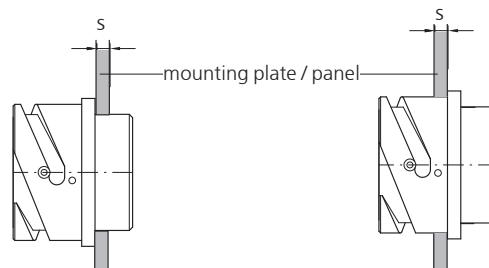
6.5.5 Dimensions

Panel cut out,
for receptacle with flange rear panel mount



Size	R +0.1 / -0.1	G	T
14S	23.0	25.5	3.5

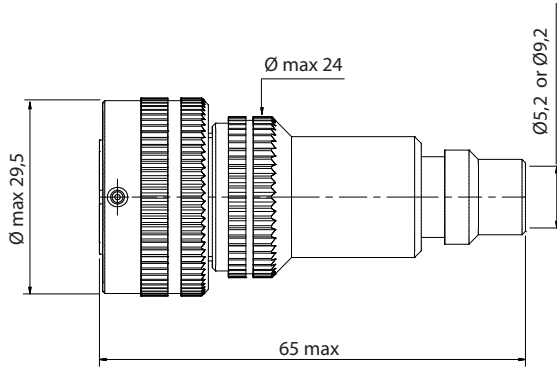
Reference table for max. panelthickness



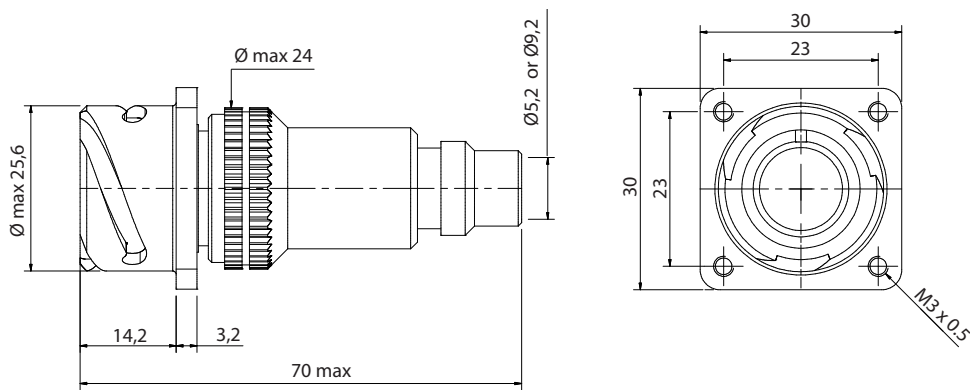
Size	Front panel mounting s max.	Rear panel mounting s max.
14S	3.70	4.0

Front panel mount only if no EMI adapter is used

Plug, straight



Receptacle, straight, at rear panel mount



6.5.6 Contact inserts - overview

Front view
to pins



Layout	14S-2 *	14S-5	14S-A7	14SZ-10 **
Number of contacts	4	5	7	10
Size of contacts	16S	16S	16S	20
Voltage Index ¹⁾	INST	INST	INST	SPEC
Grommet	x	x	o	o

* Insert for Ethernet cat 5

** Insert for Ethernet cat 6

x = Grommet standard

o = for Grommet ask GIMOTA

¹⁾ See 6.5.2

Contact size



6.5.7 Individual parts

Plug



Plug size 14S with
pin contact insert



Plug size 14S with
socket contact insert

Size	No. of contacts	Type of contacts	Item number
14S	4	pin	GB601-14S-2PN-EAE
14S	5	pin	GB601-14S-5PN-EAE
14S	7	pin	GB601-14S-A7PN-EAE
14S	10	pin	GB601-14SZ-10PN-EAE
14S	4	socket	GB601-14S-2SN-EAE
14S	5	socket	GB601-14S-5SN-EAE
14S	7	socket	GB601-14S-A7SN-EAE
14S	10	socket	GB601-14SZ-10SN-EAE

Receptacle



Receptacle size 14S
with socket contact insert
threaded fixing holes M3



Receptacle size 14S
with pin contact insert
threaded fixing holes M3

Size	No. of contacts	Type of contacts	Item number
14S	4	pin	GB211-14S-2PN-EAE-A01
14S	5	pin	GB211-14S-5PN-EAE-A01
14S	7	pin	GB211-14S-A7PN-EAE-A01
14S	10	pin	GB211-14SZ-10PN-EAE-A01
14S	4	socket	GB211-14S-2SN-EAE-A01
14S	5	socket	GB211-14S-5SN-EAE-A01
14S	7	socket	GB211-14S-A7SN-EAE-A01
14S	10	socket	GB211-14SZ-10SN-EAE-A01

EMI adapter



Description	Item number
EMI adapter, for cable- $\varnothing \leq 5$ mm	EC-14-05-AE
EMI adapter, for cable- $\varnothing \leq 9$ mm	EC-14-09-AE

Shielding sleeve



Description	Item number
Shielding sleeve for EMI adapter EC-14-05-AE	SUGSC297
Shielding sleeve for EMI adapter EC-14-09-AE	SUGSC500

Heatshrinkable shape



Description	Item number
Adhesive for strain relief to EMI adapter EC-14-05-AE	FTH08-04
Adhesive for strain relief to EMI adapter EC-14-09-AE	FTH11-06

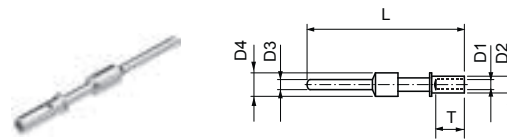
Plastic protection cap



Description	Item number
Plastic protection cap for receptacles	PR14S-D
Plastic protection cap for plugs	PP14S-D

6.5.8 Contacts

The given cross sections and AWG sizes are reference values and based on market available wires and conductors that have been pressed with GIMOTA-crimping tools. Individual qualification testing by the user is recommended.



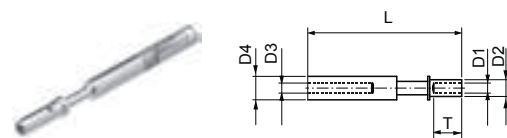
Material Pin contact

Contact material: Cu alloy

Contact surface: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni

Electrical properties see 6.5.2

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG		± 0.05	± 0.1	± 0.05	± 0.1	± 0.5	± 1.0	
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40553-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40553 AU
20	0.5	22-18	4.5	1.30	1.90	1.0	2.0	4.3	20.4	10-40549-05 AU



Material Socket contact

Contact material: Cu alloy

Contact surface: **AU** = gold plated: min. 0,5 µm over 2,5 µm Ni

Electrical properties see 6.5.2

Contact size	Conductor		strip-ping	D1	D2	D3	D4	T	L	Item number
	mm ²	AWG		± 0.05	± 0.1	± 0.05	± 0.1	± 0.5	± 1.0	
16S	0.25-0.5	22-20	7.0	1.10	2.15	1.6	3.1	6.4	27.0	10-40552-05 AU
16S	0.75-1.5	16	7.0	1.75	2.62	1.6	3.1	6.4	27.0	10-40552 AU
20	0.5	22-18	4.5	1.30	1.90	1.15	2.0	4.3	20.2	10-40548-05 AU

Filler plugs for contact cavity size 16S see chapter 5.1.2.

Filler plugs for contact cavity size 20, on request.

6.5.9 Assembling tools

Assembling receptacle



Description	Item number
Assembling receptacle for plug	WSM14

Press tool for contacts



Mechanical press tool with exchangeable press-head dies for various contacts and wire cross sections. One-way ratchet action ensures complete and precise compression with automatic release at completion of the pressing cycle.

Dimensions: 200 mm x 65 mm
Weight: 0.3 kg (incl. press-head die)

Contact size	Cross-section		Tool Item number	Die Item number
	mm ²	AWG		
16S	0.25-0.5	20	GIW10V	GIM10V16/0.25-1.5
16S	0.75-1.5	18-15	GIW10V	GIM10V16/0.25-1.5
20	0.5	20	GIW10V	GIM10V20/0.5

Press tool for shielding sleeves

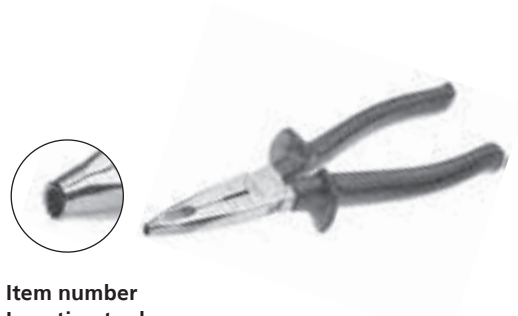


Mechanical press tool with exchangeable dies for different shielding sleeve sizes. One-way ratchet action ensures complete and precise compression with automatic releases and completion of the pressing cycle.

Dimensions: 270 mm x 80 mm
Weight: 0.7 kg

Shielding sleeve	Tool Item number	Die Item number
SUGSC297	GIW30L	GIM30K06
SUGSC500	GIW30L	GIM30S12

Insertion tool for contacts

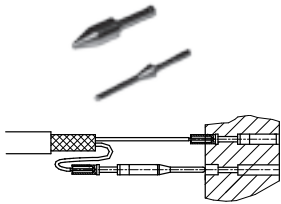


Contact size	Cross-section		Item number Insertion tool
	mm ²	AWG	
16S	0.5-0.75	20	WMK0 GR16/0.5 – 0.75
16S	1.0-1.5	18-15	WMK0 GR16/1.0 – 1.5 GR12/0.5
20	0.5	20	WMK0 GR20/0.5

Location pin for contacts

For simplified and secure application of socket contacts into the contact insert

Contact size	Item number location pin
16	WMP0K16
20	WMP0K20



Extraction tool for contacts

The inserts can be stored in the handle.

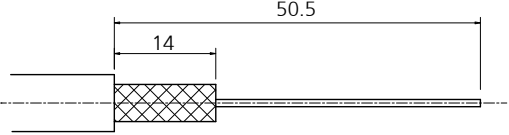





Contact size	Cross-section	Item number Handle	Item number Insert
16/16S	Socket	WML0	WML0 BU GR16
16/16S	Pin	WML0	WML0 STI GR16
20	Socket	WML0	WML0 BU GR20
20	Pin	WML0	WML0 ST GR20

6.5.10 Assembling instructions

Connector assembling

Relevant assembling tools are mentioned in chapter 6.5.9

<p>Strip cable</p> 	<p>General stripping lengths for plugs/receptacle straight version. Exact stripping dimensions have to be defined occasionally.</p>
<p>Crimp contacts</p> 	<p>Push heatshrinkable shape, shielding sleeve and EMI-adapter onto the cable. Crimp contacts to the wires see crimping tools.</p>
	<p>Push the contacts into the contact insert see insertion tools.</p>
<p>Close up the connector</p> 	<p>Screw the EMI-adapter firmly to the plug</p> <p>Caution: <i>Ensure firmly tightening of the back shell to the plug.</i> See assembling receptacle.</p>

Crimp the screen



Apply the screen equally around the adapter.



Push the shielding sleeve over the screen onto the adapter.



Compress the shielding sleeve (Hexagon compression). See press tools.

Heatshrinkable shape



Apply heatshrinkable shape with an appropriate heat-gun.

6.5.11 Numbering key

Explanation of numbering key

Plugs and receptacles – example

1)	2)	3)	4)				5)	6)		7)	8a)	8b)		9)									
A	A	N	N	N	A	A	X	X	X	X	X	X	X	A	A	-	A	A	A	-	A	N	N

1 Series
 2 Shell Type
 3 Accessories
 4 Pole layout
 5 Type of contact
 6 Coding
 7 Insert-Material
 Hyphen
 8a Shell Material
 8b Surface treatment
 Hyphen
 9 Modification code

Explanations and indications

A, A	Capital letter	bold:	Must be specified
N, N	Numeral	normal:	Specify if requested.
X, X	Numeral, Capital letter, or Hyphen	No	spaces!

Allocation of codes

- 1 Series:**
GB bayonet connector with 1 guidingkey, press-in contacts
- 2 Shell type:**
2.1 Plug without accessory:
60 Plug
- 2.2 Plug with accessory:**
06 Straight plug
- a) *Additional codes for plugs*
1 EMI (Grounding-Fingers)
- 2.3 Receptacle without accessory:**
21 Front Panel Receptacle, with Accessory-Thread
- 2.3 Receptacle with accessory:**
26 Straight Receptacle with Front-Flange
- b) *Additional-Code to Receptacles:*
1 Threaded Fixing Holes
- 3 Accessory:**
X *With special back shell*
XE EMI-adapter with shielding sleeve, heatshrinkable shape
- 4 Layout:**
14S-2 4-pole
14S-5 5-pole
14S-A7 7-pole
14SZ-10 10-pole
- 5 Type of contact:**
P Pin contacts
S Socket contacts
- 6 Coding:**
N No coding
- 7 Insert Material:**
E Ethylene acrylate GXF
- 8a Shell material:**
A Aluminium alloy
- 8b Surface treatment:**
E Electroless Nickle [*conductivee*]
- 9 Modification code:**
A10: *with EMI adapter EC-14-05-AE*
 incl. shielding sleeve and heatshrinkable shape.
A20: *with EMI adapter EC-14-09-AE*
 incl. shielding sleeve and heatshrinkable shape.

7 Assembling tools

7.1 Press tool

7.1.1 Press head RHC131 for contacts size 0, 0* and 4/0



RHC131

Hydraulic press head with exchangeable press dies for various cross-sections. Rapid-action hydraulic coupling for connection to pump. End operating pressure 700bar.

Dimensions: 232 mm x 124 mm
Weight: 3.9 kg

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
0, 0*	16	5	RHC131	WMPS GR0/16-C
0, 0*	25	3	RHC131	WMPS GR0/25-C
0, 0*	35	2	RHC131	WMPS GR0/35-C
0, 0*	50	1/0	RHC131	WMPS GR0/50-C
4/0	70	–	RHC131	WMPS GR4/0/70-C
4/0	95	–	RHC131	WMPS GR4/0/95-C
4/0	120	4/0	RHC131	WMPS GR4/0/120-C

7.1.2 HT45-E press tool for contacts size 4, 0 and 0*



HT45-E

Hydraulic press tool with exchangeable press dies for various cross-sections. One-way ratchet action ensures complete, precise pressing and releases automatically on completion of the pressing cycle.

Dimensions: 346 mm x 130 mm
Weight: 2.0 kg

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
4	6	10	HT45-E	WMPS GR4/06-45
4	10	7	HT45-E	WMPS GR4/10-45
4	16	5	HT45-E	WMPS GR0-4/16-45
0, 0*	16	5	HT45-E	WMPS GR0-4/16-45
0, 0*	25	3	HT45-E	WMPS GR0/25-45
0, 0*	35	2	HT45-E	WMPS GR0/35-45
0, 0*	50	1/0	HT45-E	WMPS GR0/50-45

New: Also, as a practical battery bar-press available.

7.1.3 Press tool for contacts sizes 8, 8H, 12, 16 and 16S



GIW10V

Mechanical press tool with exchangeable press-head dies for various contacts and wire cross sections. One-way ratchet action ensures complete and precise compression with automatic release at completion of the pressing cycle.

Dimensions: 200 mm x 65 mm
Weight: 0.3 kg (incl. press-head die)

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
12	0.5	20	GIW10V	GIM10V12/0.5-1
12	0.75-1.0	18-17	GIW10V	GIM10V12/0.5-1
12	1.5-2.5	15-13	GIW10V	GIM10V12/1.5-6
12	4-6	11-10	GIW10V	GIM10V12/1.5-6
16	0.25-0.5	22-18	GIW10V	GIM10V16/0.25-1.5
16	0.75	18	GIW10V	GIM10V16/0.25-1.5
16	1.0	17	GIW10V	GIM10V16/0.25-1.5
16	1.5	15	GIW10V	GIM10V16/0.25-1.5
16S	0.25-0.5	20	GIW10V	GIM10V16/0.25-1.5
16S	0.75-1.5	18-15	GIW10V	GIM10V16/0.25-1.5
20	0.5	20	GIW10V	GIM10V20/0.5



GIW30L

Mechanical press tool with exchangeable dies for various contacts and wire cross sections. One-way ratched action ensures complete and precise compression with automatic releases at completion of the pressing cycle.

Dimensions: 270 mm x 80 mm
Weight: 0.7 kg

Contact size	Cross-section		Item number Tool	Item number Die
	mm ²	AWG		
8H	1.5	16	GIW30L	GIM30L8H/1.5-10
8H	2.5	12	GIW30L	GIM30L8H/1.5-10
8H	6	10	GIW30L	GIM30L8H/1.5-10
8H	10	6	GIW30L	GIM30L8H/1.5-10

7.2 Insertion and extraction tools

7.2.1 Insertion tool for contacts

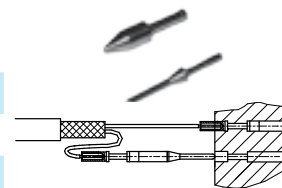


Contact Size	Cross-section		Item number Insertion tool
	mm ²	AWG	
8 / 8H	10	7	WMK0 GR8/10
8H	1.5	15	WMK0 GR12/1.5-2.5
8H	2.5	13	WMK0 GR12/1.5-2.5
8H	6	10	WMK0 GR12/4.0-6.0
12	0.5	20	WMK0 GR16/1.0-1.5 GR12/0.5
12	0.75-1.0	18-17	WMK0 GR12/0.75-1.0
12	1.5-2.5	15-13	WMK0 GR12/1.5-2.5
12	4-6	11-10	WMK0 GR12/4.0-6.0
16	0.5-0.75	20-18	WMK0 GR16/0.5-0.75
16	1.0-1.5	17-15	WMK0 GR16/1.0-1.5 GR12/0.5
16S	0.5-0.75	20	WMK0 GR16/0.5-0.75
16S	1.0-1.5	18-15	WMK0 GR16/1.0-1.5 GR12/0.5
20	0.5	20	WMK0 GR20/0.5

7.2.2 Location pin for contacts

For simplified and secure application of socket contacts into the contactinsert

Contact size	Item number Location pin
12	WMP0K12
16	WMP0K16
20	WMP0K20



7.2.3 Extraction tool for contacts



The inserts can be stored in the handle.

Contact size	Cross-section	Item number Handle	Item number Insert
8	Socket	WML0	WML0 BU GR8
8	Pin	WML0	WML0 STI GR8
12	Socket	WML0	WML0 BU GR12
12	Pin	WML0	WML0 STI GR12
16/16S	Socket	WML0	WML0 BU GR16
16/16S	Pin	WML0	WML0 STI GR16
20	Socket	WML0	WML0 BU GR20
20	Pin	WML0	WML0 ST GR20

8 General Conditions

8.1 Product Safety

Information and advice given in the following is applicable in connection with the use of our products and data contained in our data sheets and catalogue. Failure to comply with the advice can put people and equipment at severe risk.

1. Materials

Electrical plug-type connectors contain no substances that could be dangerous in normal operation. The connectors consist of conducting and non-conducting materials.

Circular connectors:

Insulators and gaskets are made of rubber, synthetic rubber compounds or of plastic. The shells are generally made of metal. Accessories can be made of metal or plastic. The contacts consist of copper or copper alloys with a galvanic coating of gold or silver. Other alloys and surface coatings are also used for special applications.

2. Hazards

When plug-type connectors are correctly wired and are used and handled with due regard to the given parameters, there will be generally no risk.

Incorrect wiring or assembly of connectors can lead to electric shock, burns or fire. The same applies to careless handling of metal tools or conductive fluids, as well as to the use of defective parts, e.g. damaged during transport or storage.

Live circuits may not be made or broken by means of plug-in connectors. This can lead to ionization and arcing, causing electric shock, burns or fire. Such manipulations can also cause electronic circuits to be destroyed.

Only contacts in correctly assembled plug-in connectors may be energized. Abnormal rises in resistance in a plug-in connector can cause it to become overheated. An increase in resistance can be caused by cracked, broken or deformed contacts or by broken wires in the conductor strand, as well as by badly made crimps due to the wrong or defective crimping tool being used, by poor solder joints or by screw connections not being properly tightened. Oxide films and the presence of contamination on the contacts or crimps can also lead to rises in resistance and therefore to local overheating. Overheating can further be caused by the formation of creepage paths or short circuits in the plug due to:

- water entering through badly sealed cable clamps or due to the capillary effect along the conductor wires;
- contamination of the insulator or residues left over from processing (e.g. bits of wire) in the connector.

We warn against exceeding the continuous currents given in our documentation, as this too can cause overheating of the connector.

Overheating of a plug-type connector causes the insulator to be destroyed. This can result in spurious signals; also, there is the danger of electric shock or of fire, with toxic gases formed in combination with other materials. Since overheating is not necessarily visually apparent, there is a risk of burns being caused if overheated parts are touched.

3. Handling

Components of electrical plug-type connectors must be carefully handled during transport, storage and use to avoid damage. Although these parts normally have no sharp edges or corners, care should be taken to ensure that no injury to fingers can occur. Plug-type connectors can be damaged in transit to the customer. Such damage can be a source of danger. These products should therefore be checked before installation or use, and damaged ones removed.

4. Disposal and scrapping of waste

Dangerous or even toxic gases can be formed when certain materials are burned. Such materials must therefore be disposed of in the proper manner.

5. Application

Plug-type connectors with accessible contacts should not be used on the supply side of the electric circuit.

Touching the exposed contacts of an unconnected plug-type connector can result in an electric shock. Voltages above 30 V AC or 42.5 V DC are generally dangerous. It must be ensured that such voltages cannot under any circumstances reach the accessible metal parts of the connector housing. Before energizing with voltage, plug-type connectors and the wiring should be checked. It must be ensured that metal parts and insulators are not damaged, and that no soldering jumper, loose wire strands, conductive fluids or other conducting materials can form an electrical bond. The circuit should be checked for insulation resistance and electrical continuity. It is essential that the correct working tools are used, in accordance with our data sheets.

Only qualified personnel should be allowed to wire, assemble or modify plug-type connectors.

The pertinent national regulations should be referred to in order to determine the permitted operating voltage.

6. Important general note

6.1 Product design

We are committed to a policy of continuous improvement and further development of our products. Because of this, our products may differ from the descriptions, technical data and figures in this catalogue and in the data sheets.

Unless otherwise stated, all dimensions in this catalogue are approximate values in mm.

6.2 Insulation clearances, ambient conditions

The permitted operating voltages depend on the specific application and on the applicable national safety regulations. For this reason, the clearances and creepage distances are given as reference values. Attention should therefore be given to reductions in the clearances and creepage distances due to the circuit board and/or wiring. All voltage data are valid at sea level and a temperature of 20°C. The given temperatures are temperature limits. The permitted operating temperature will depend on the actual application.

6.3 Fabrication instructions

Our detailed fabrication instructions should be referred to when processing work is carried out.

8.2 General Sales Conditions

The present General Sales Conditions are binding and exclusively applicable, if no deviating or additional conditions have been mutually agreed between the buyer and Gimota Inc.. Any deviations need to be stipulated accordingly in writing. .

General

The published pictures, dimensions and weights within catalogues and drawings are for information only without obligation regarding the supplied goods. Literal errors excepted.

Offers

Our offers are valid for a period of 3 months unless other terms have been stipulated. Extraordinary price changes for raw materials are excepted.

Prices / Packaging / Conditions of Payment / Surcharges

If nothing else is stipulated our prices are quoted in Swiss francs CHF for delivery ex works (INCOTERMS 2010, EXW Geroldswil) exclusive packaging and value-added tax (VAT) .

Total order values below CHF 100 will incur an order processing charge of CHF 20.

Packing is charged according actual cost.

The general payment terms are 30 days net as of invoice date.

We reserve the right to charge interest of 5% on late payments.

Transfer of Gain and Risk, Shipment and Insurance

Gain and risk is transferred to the buyer with dispatch of the consignment ex works. Shipment is carried out with invoice and at the consignee's risk. Transport insurance is taken out by us only upon written request of the consignee. The cost of the insurance is borne by the consignee.

Delivery periods / Delivery date

Delivery periods given in our offers begin with the receipt of the order. The delivery time is deemed as achieved if on its expiry, the consignment is prepared and ready for dispatch from the factory. We make every effort to adhere to delivery dates given in our order confirmations. However, they are non-binding, and overruns cannot be taken as reason for damages claims or cancellations of concerning orders.

Lack of raw materials, defects on tools, transport/logistic problems and comparable influences could decisively raise cost and reduce the feasibility of the products. If this makes it impossible for us to comply with our delivery commitment we are released from our delivery obligations without any compensation claims. Recognisable delays will be communicated immediately.

Documents / Samples

Our catalogues, drawings, sketches, etc. are our intellectual property, and shall not be modified or used for purposes other than intended without our written acceptance.

Samples are provided at a charge.

Testing and Acceptance of the Consignment

The buyer is requested to inspect/test the consignment on receipt and report any defects that are found in writing within 10 days to Gimota Inc. If no failures or irregularities are reported the consignment is deemed to be approved by the receiver.

If more extensive tests and reports (such as factory- or inspection certificates) are requested by the buyer, it must be agreed on in writing and mentioned within the concerning orders. The costs must be borne by the buyer.

Products assessed as defective are not supposed to be returned without our agreement. Otherwise developing delivery cost will be charged accordingly.

Parts which are found to be unusable due to material defects or production failures will be either replaced or repaired, as we consider appropriate.

Property Rights

The delivered goods remain our property until the full purchase price has been paid. The buyer assures participation for adequate arrangements in order to protect our property accordingly.

Cancellation / Returning goods

The cancellation of contracts requires our written agreement.

Cost for pre-processed or finished parts will be charged in any case.

Raw materials specially purchased for a customer will also be charged.

Complaints regarding a consignment do not entitle the purchaser to cancel the remainder of an order. Produced and delivered goods can not be returned to the supplier.

We are authorized to withdraw from delivery obligations if the financial situation of the buyer markedly deteriorate or appears different than originally presented to us.

Warranty

During the warranty period Gimota Inc. is obligated to replace or repair, all parts that are defective or unusable as a result of material defects or of design/production failures, as we consider necessary, as soon as possible. Warranty claims require a written request from the buyer. The warranty period is 12 months after receipt of the consignment as far as no other legal regulations are effective. Excluded from the warranty are damages due to incorrect storage, natural wear, faulty processing and disregard of regulations, etc.

Modifications or repair of products without our written acceptance as well as not following our operating instruction exculpate us from product warranty.

Our liability is limited on the replacement of defective goods or on reimbursement of the invoiced value.

Exclusion of other Liabilities

Possible claims by the purchaser are fully covered within these „General Sales Conditions“. All not expressly mentioned claims for damages, reduction, cancellation of or withdrawal from the contract are excluded.

Jurisdiction

The place of jurisdiction for any direct or indirect differences/ disputes is Zurich, Switzerland only. The legal relationship is subjected to substantive Swiss law.

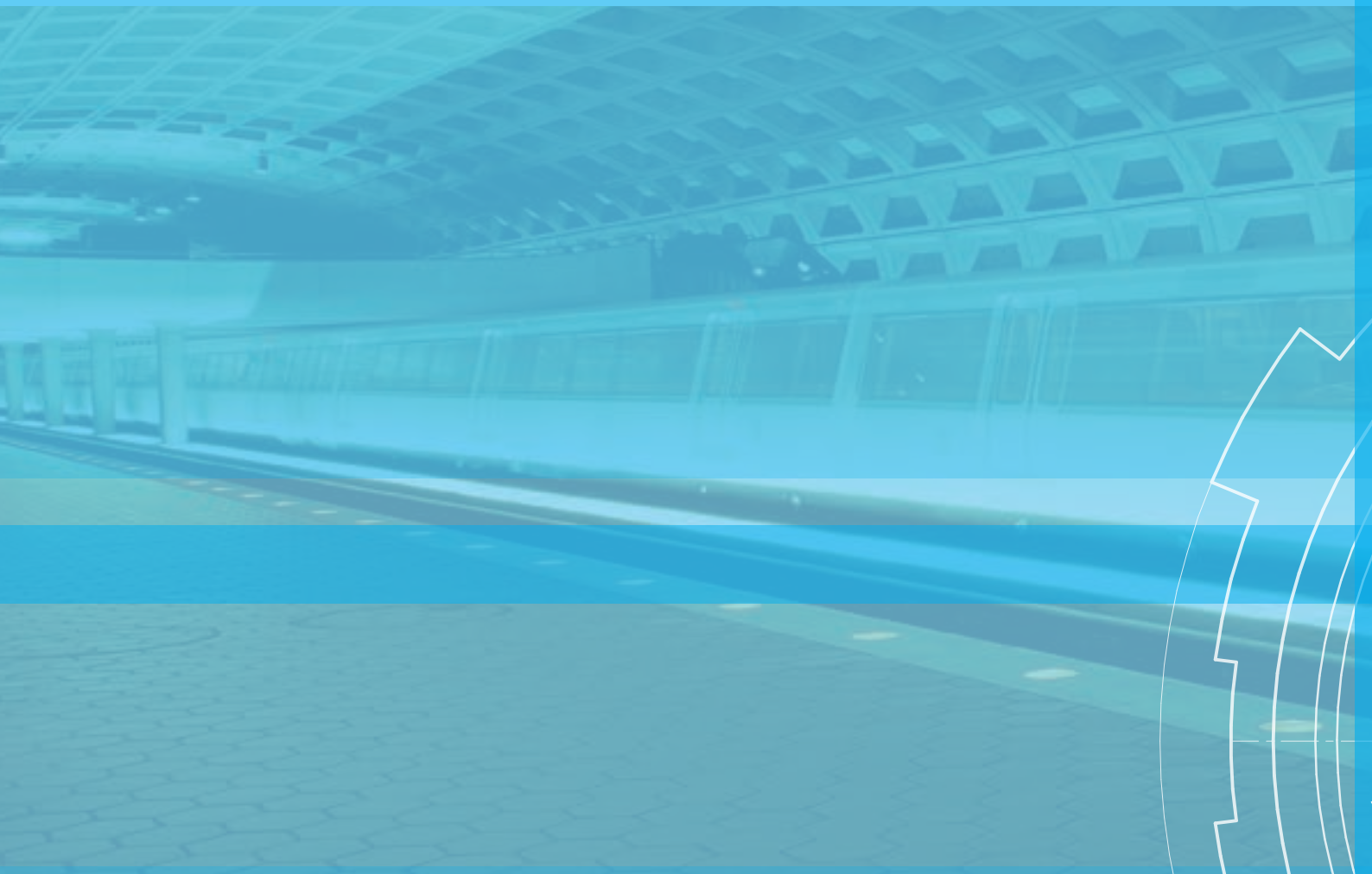
The General Sales Conditions valid at the purchase date are mandatory and considerable.

The current and up-to date sales conditions are explicitly published on www.gimota.com

Final Provisions

The General Sales Conditions have been update as per **January 1st 2013**. They replace all previous versions and are integrated part of all our offers and order confirmations.

With this edition all previous versions are void. In case of discrepancies between the German text and any other-language version of these General Terms of Business, the German original text shall prevail.



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