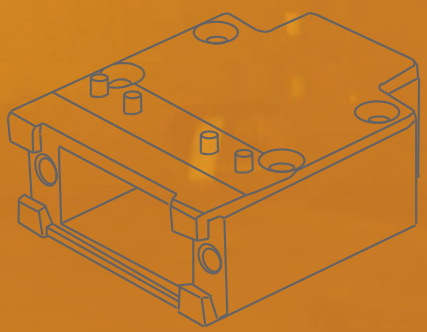
GIMOTA

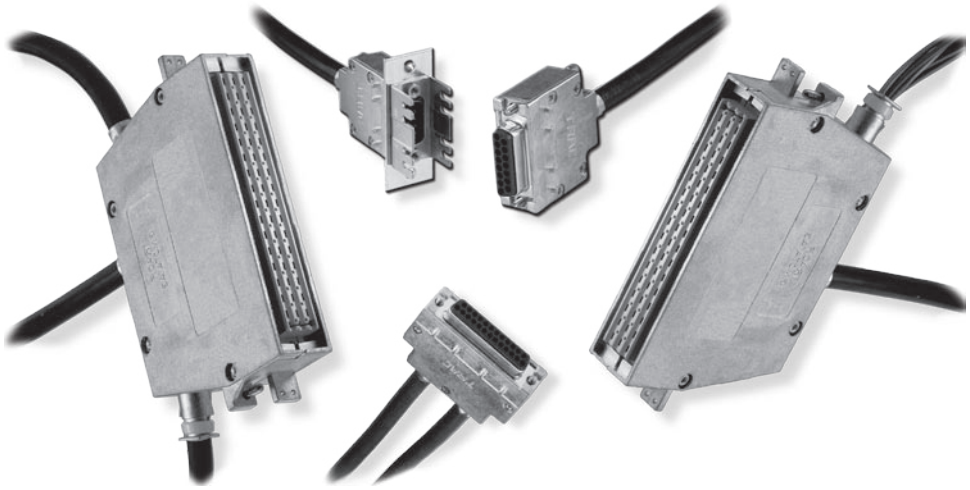
# GIMOTA AG
# DATACONNECTOR CATALOGUE
## 2010



GIMOTA AG: SWITZERLAND

# GIMOTA DATA CONNECTORS

## CATALOGUE 2010



GIMOTA AG

Chrummacherstr. 3
8954 Geroldswil
T: +41 44 749 3010
F: +41 44 749 3015

W: www.gimota.com

| | | |
|---|---|---|
| **1** | **General Information** | **4** |
| 1.1 | GIMOTA AG | 4 |
| **2** | **Data Connectors General** | **4** |
| 2.1 | Introduction | 4 |
| **3** | **D-SUB Data signal connectors** | **5** |
| 3.1 | Introduction | 5 |
| *3.1.1* | *General technical data* | *5* |
| 3.2 | Single parts and contacts for data signal connectors D-SUB | 7 |
| *3.2.1* | *Socket housings D-SUB TRAC* | *7* |
| *3.2.2* | *Pin housings D-SUB TRAC* | *8* |
| *3.2.3* | *Socket housings D-SUB TRAC H* | *9* |
| *3.2.4* | *Pin housing D-SUB TRAC H* | *9* |
| *3.2.5* | *Covers D-SUB* | *10* |
| *3.2.6* | *Cable clamps / shielding sleeves / wire hole plugs* | *11* |
| *3.2.7* | *Coding plates / coding slides / Fixing plates* | *12* |
| *3.2.8* | *Screws / spring washers* | *13* |
| *3.2.9* | *D-SUB Contacts* | *15* |
| 3.3 | D-SUB Connector sets, TRAC | 16 |
| *3.3.1* | *Plug set TRACST* | *16* |
| *3.3.2* | *Receptacle set TRACDO* | *17* |
| *3.3.3* | *Mounting strip TRACBE for direct fixation to casings/boards* | *18* |
| 3.4 | D-SUB Connector sets, TRAC H for increased voltage requirements | 19 |
| *3.4.1* | *Plug set TRACHST* | *19* |
| *3.4.2* | *Receptacle set TRACHDO* | *20* |
| *3.4.3* | *Mounting strip TRACHBE for direct fixation to casing/boards* | *21* |
| 3.5 | D-SUB Cover set | 22 |
| *3.5.1* | *Plug cover set TRACST* | *22* |
| *3.5.2* | *Receptacle cover set TRACDO* | *22* |
| 3.6 | Tools for D-SUB TRAC / TRAC H | 23 |
| *3.6.1* | *Compression tool for cable clamps and shielding sleeves* | *23* |
| *3.6.2* | *Crimping tool for contacts* | *23* |
| *3.6.3* | *Insertion and extraction tools* | *24* |
| *3.6.4* | *Supporting Tools* | *25* |
| 3.7 | Assembly instructions D-SUB TRAC / TRAC H | 26 |
| *3.7.1* | *Preparation* | *26* |
| *3.7.2* | *Cabel set* | *27* |
| *3.7.3* | *Assembling* | *29* |

| | | |
|---|---|---|
| **4** | **Data Connector TRAC F** | **30** |
| 4.1 | Introduction | 30 |
| *4.1.1* | *Technical Information* | *30* |
| 4.2 | Single parts and contacts for data signal connectors TRAC-F | 32 |
| *4.2.1* | *Contact Housings TRAC-F* | *32* |
| *4.2.2* | *Cover TRAC F* | *33* |
| *4.2.3* | *Cable clamp / Shielding sleeves / Wire hole plug* | *33* |
| *4.2.4* | *Code screw / Code pin* | *35* |
| *4.2.5* | *Screws / Washer* | *35* |
| *4.2.6* | *Contacts* | *36* |
| 4.3 | Connector sets TRAC F | 37 |
| *4.3.1* | *Connector parts set TRAC F* | *37* |
| 4.4 | Tools for data connectors TRAC F | 38 |
| *4.4.1* | *Compression tool for cable clamps and shielding sleeves* | *38* |
| *4.4.2* | *Crimping tool for contacts* | *38* |
| *4.4.3* | *Extraction tool for contacts* | *39* |
| *4.4.4* | *Accessories* | *39* |
| 4.5 | Assembly Instructions TRAC F | 40 |
| *4.5.1* | *Preparation* | *40* |
| *4.5.2* | *Cabel set* | *41* |
| *4.5.3* | *Assembling* | *43* |
| **5** | **Connector Kit F9/3BHC** | **44** |
| 5.1 | Introduction | 44 |
| *5.1.1* | *Technical Information* | *44* |
| 5.2 | Connector set F9/3BHC | 45 |
| *5.2.1* | *Connector parts set F9/3BHC 860 070 R100* | *45* |
| *5.2.2* | *Multipoint Connectors F9/3BHC* | *46* |
| **6.0** | **General Conditions** | **47** |
| 6.1 | General Sales Conditions | 47 |
| 6.2 | Product Safety | 48 |

# 1 General Information

## 1.1 GIMOTA AG

GIMOTA situated near Zurich Switzerland was founded in 1961 by Otto Schoch. The company has been amongst others specialized in supplying connectors for the use in railway applications. These are for example CIRCULAR CONNECTORS for power and data signal transmission or DATA CONNECTORS for signal transmission. Continuing in-house developments concentrated 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 lots of different applications. For example: high current feedings, conventional and electronic control systems, measuring probes of all kinds, analogue and digital data and signal transmission. All this is achieved at any installation conditions and in the most various subsystems on traction vehicles or in coaches. GIMOTA connectors are furthermore used in stationary systems for various applications.

GIMOTA supplies it's products to most of the leading European railway manufacturers.

GIMOTA is known for it's high flexibility. The company develops and manufactures connectors for specialized applications according to customer specifications. Even small batches are welcome to be realised.

GIMOTA takes all possible efforts to process any appropriate logistics solution, such as „just-in-time" deliveries based on an order contract and forecasts, or maintaining minimum inventory levels specified with the customer.

GIMOTA is one of the leading providers of industrial traction connectors, and is continuously expanding its market share due to solutions always focused on customers demands. Top-quality products, and a consulting/marketing strategy takes full account of end users' needs.

# 2 Data Connectors General

## 2.1 Introduction

**GIMOTA** data connectors with the identification TRAC are characterized by a 360 ° EMC shielding system with integrated strainrelief. These connectors are available in the following versions:

- **D-SUB series TRAC:**
  Standard version, socket / pin for housing, for example used in MITRAC vehicle control systems

- **D-SUB series TRAC H:**
  Modified design for increased voltage requirements, socket / pin for housing, for example used in S2 MICAS vehicle control systems

- **TRAC series F:**
  Housing for frame connectors type F, H, and DM according to EN IEC 60603-2 (DIN 41612)

The connectors comply with EN 60529 according to protection class IP44. Each cable can be applied with a 360 ° EMC shielding. All connectors are codeable if required.

The essential characteristics of these railway specific connectors are:

- Solid zinc cast housing (self pasivating)
- Strain relief on each cable
- Connection of cable screen to cable clamp
- Excellent contact between the housing and the cable clamp (also at higher currents)
- Easy codable (also after assembling)
- All accessories screws of stainless steel
- RoHS-Compliance

# 3 D-SUB Data signal connectors

## 3.1 Introduction

D-SUB connectors, designated **TRAC**, were specially developed for use in supervisory control systems. TRAC connectors are fitted with sturdy cast-zinc covers for 360° EMI screening and can be coded if required.

The connectors comply with protection class IP44 as per EN 60529, and are approved for indoor applications.

D-SUB connectors from the TRAC series can be ordered either as single parts or as sets.

When ordering connector sets, it is required to separately order the contacts (single or strip) and shielding sleeve (different sizes).

Basically, there are two types of contact housing:

**TRAC** socket/pin housing, the standard design (e.g. for MITRAC) up to 1 kV.

**TRAC H** socket/pin housing, designed for more demanding applications (e.g. for MICAS S2) up to 1.5 kV.

### *3.1.1 General technical data*

**Electrical properties**

All electric data are valid on sea level with an environment temperature of 20 °C.
Deviating environment conditions are to be taken into account with the plug interpretation.

| | | D-SUB TRAC | D-SUB TRAC H |
|---|---|---|---|
| Socket housing | | Type SUH...S | Type SUHV...S |
| Pin housing | | Type SUH...P | Type SUHV...P |
| Test voltage | [V] AC 1 Min | 1000 | 1500 |
| Service voltage | [V] AC/DC | 125 | 125 |
| Operation current at 20° C | [A] | max. 3 | max. 3 |
| Potential drop accross contacts | [mV] | max. 24 | max. 24 |
| Creepage distance in connecting zone | [mm] | min. 1.5 | min. 3 |
| Creep resistance acc. to IEC 60664 | CTI-Wert | >300 | >300 |
| Insulation resistance | [MΩ] | >5000 | >5000 |

**Thermal properties / Fire characteristic**

| | | D-SUB TRAC / TRAC H |
|---|---|---|
| Contact housing material | | Thermoplastic, black |
| Service Temperature | | -55° C to +105° C |
| Fire resistance class | UL 94 | V-0 |

**Mechanical properties contacts**

| | | D-SUB TRAC / TRAC H<br>acc. to DIN IEC 60512-5 |
|---|---|---|
| Connecting life cycle of contacts | mating cycles | min. 500 |
| Separating force of contact | [N] | > 0.2 |
| Mating force of contact | [N] | < 3.4 |
| Terminal cross-section:<br>Data-Signal contacts | | 0.2 to 0.56mm²<br>AWG24-20 |
| Terminal cross-section:<br>Power contacts | | 0.8 to 8mm²<br>AWG18-8 |

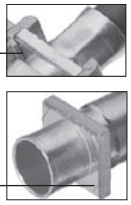
### Mechanical properties connectors

| | D-SUB TRAC / TRAC H |
|---|---|
| Cover | 3 sizes, screw-on cover |
| Cover material | zinc cast (self-passivating) |
| Contact housing material | thermoplastic, black |
| Screw material | stainless steel V2A |
| EMI shielding | with compressible shielding sleeve: 360° |
| Coding | at least 24 possibilities (mechanically) |
| Cable strain relief | crimpable or with cable tie up to 150 N |

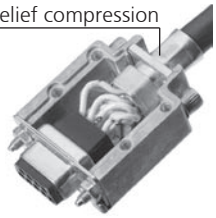
### Strain relief

The cable clamp shall be tightly pressed into the guiding grooves of the connector cover

Elevated spikes at the corners ensure a proper contact with the connector cover



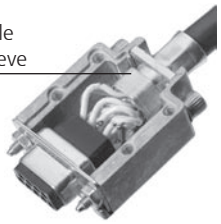
Strain relief compression



The cable is held in the cable clamp with strain relief compression onto the cabel. The cable clamps have different diameters for use with various cables. Cable diameters can be adapted to the cable clamp size using heat-shrinkable tubes. In such cases and when cable types are used the first time, the strain relief crimp should be tested by means of a tensile test. During the test, the cable should resist a pull-out value of approximately 150 N for 1 minute. The appropriate compression tools guarantee a constant compression value by the two dies touching each other at the end of the compressing process.

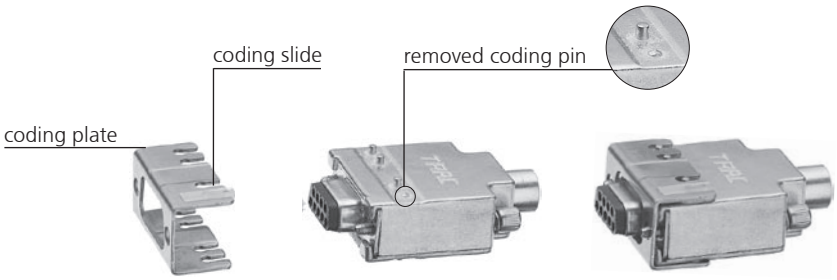
### EMI-Shielding

Compressable shielding sleeve



To provide 360° EMI connection, the TRAC connector has a separate crimp for proper contactof the cable shield to the cable clamp by using a shielding sleeve. The cable clamp features small side spikes which guarantee a conductive connection to the connector shell. The appropriate compression tools ensure easy positioning and compression of the shield bushing.

### Coding

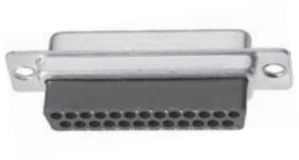


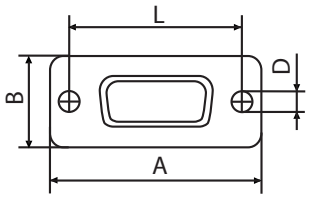

Coding a TRAC D-SUB connector:
1. Remove coding pins on D-SUB cover using the coding pliers
2. Insert coding slide corresponding to this position in the coding plate using the coding tool

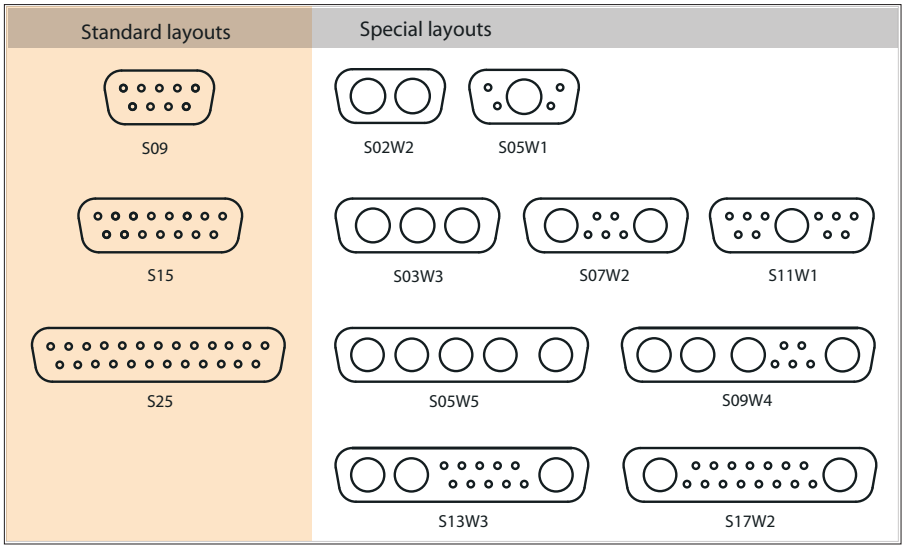
Coding of TRAC connectors can be carried out on site.

## 3.2 Single parts and contacts for data signal connectors D-SUB

### *3.2.1 Socket housings D-SUB TRAC*





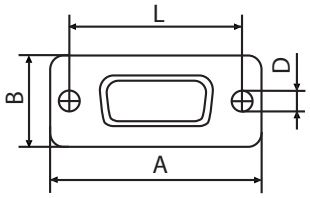



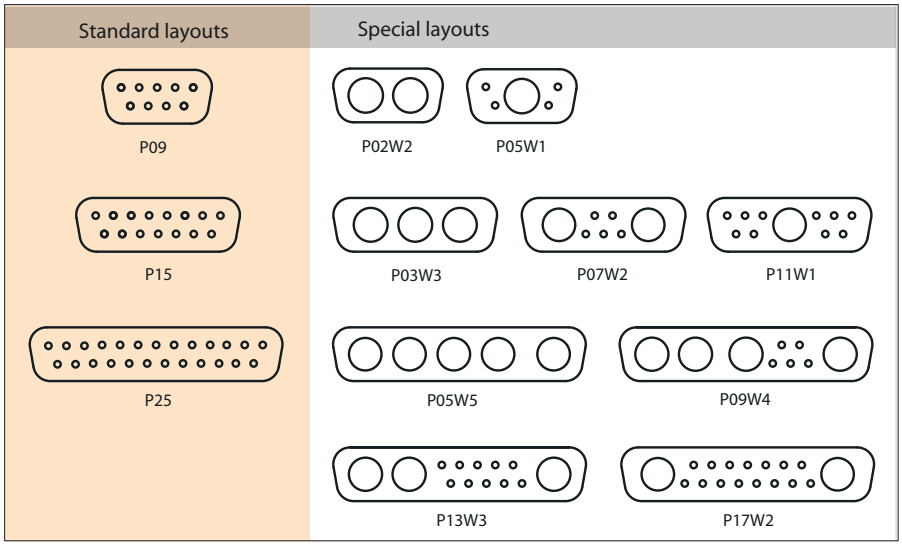

Material: Thermoplastic / steel tin plated

| Item number | Cover Size | Poles | L mm | D mm | A mm | B mm | Layout Code |
|---|---|---|---|---|---|---|---|
| SUH02W2S | 1 | 2-poles | 25.8 | 3 | 30.8 | 12.5 | S02W2 |
| SUH05W1S | 1 | 5-poles | 25.8 | 3 | 30.8 | 12.5 | S05W1 |
| SUH09S | 1 | 9-poles | 25.8 | 3 | 30.8 | 12.5 | S09 |
| SUH03W3S | 2 | 3-poles | 33.3 | 3 | 39.1 | 12.5 | S03W3 |
| SUH07W2S | 2 | 7-poles | 33.3 | 3 | 39.1 | 12.5 | S07W2 |
| SUH11W1S | 2 | 11-poles | 33.3 | 3 | 39.1 | 12.5 | S11W1 |
| SUH15S | 2 | 15-poles | 33.3 | 3 | 39.1 | 12.5 | S15 |
| SUH05WS | 3 | 5-poles | 47.0 | 3 | 53.0 | 12.5 | S05W5 |
| SUH09W4S | 3 | 9-poles | 47.0 | 3 | 53.0 | 12.5 | S09W4 |
| SUH13W3S | 3 | 13-poles | 47.0 | 3 | 53.0 | 12.5 | S13W3 |
| SUH17W2S | 3 | 17-poles | 47.0 | 3 | 53.0 | 12.5 | S17W2 |
| SUH25S | 3 | 25-poles | 47.0 | 3 | 53.0 | 12.5 | S25 |

Electrical, thermal ,mechanical properties: chapter: 3.1.1

### 3.2.2 *Pin housings D-SUB TRAC*



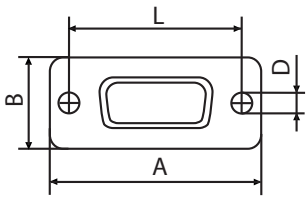



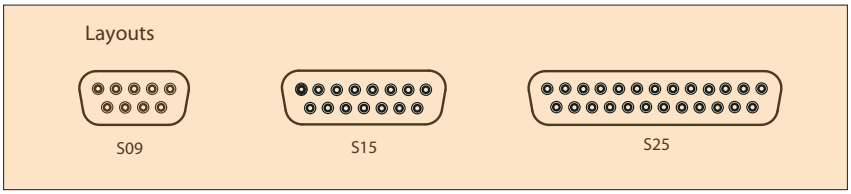

Material: Thermoplastic / steel tin plated

| Item number | Cover Size | Poles | L mm | D mm | A mm | B mm | Layout Code |
|---|---|---|---|---|---|---|---|
| SUH02W2P | 1 | 2-poles | 25.8 | 3 | 30.8 | 12.5 | P02W2 |
| SUH05W1P | 1 | 5-poles | 25.8 | 3 | 30.8 | 12.5 | P05W1 |
| SUH09P | 1 | 9-poles | 25.8 | 3 | 30.8 | 12.5 | P09 |
| SUH03W3P | 2 | 3-poles | 33.3 | 3 | 39.1 | 12.5 | P03W3 |
| SUH07W2P | 2 | 7-poles | 33.3 | 3 | 39.1 | 12.5 | P07W2 |
| SUH11W1P | 2 | 11-poles | 33.3 | 3 | 39.1 | 12.5 | P11W1 |
| SUH15P | 2 | 15-poles | 33.3 | 3 | 39.1 | 12.5 | P15 |
| SUH05W5P | 3 | 5-poles | 47.0 | 3 | 53.0 | 12.5 | P05W5 |
| SUH09W4P | 3 | 9-poles | 47.0 | 3 | 53.0 | 12.5 | P09W4 |
| SUH13W3P | 3 | 13-poles | 47.0 | 3 | 53.0 | 12.5 | P13W3 |
| SUH17W2P | 3 | 17-poles | 47.0 | 3 | 53.0 | 12.5 | P17W2 |
| SUH25P | 3 | 25-poles | 47.0 | 3 | 53.0 | 12.5 | P25 |

Electrical, thermal ,mechanical properties: chapter: 3.1.1

### 3.2.3 Socket housings D-SUB TRAC H



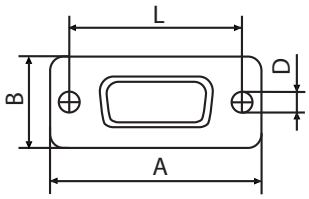



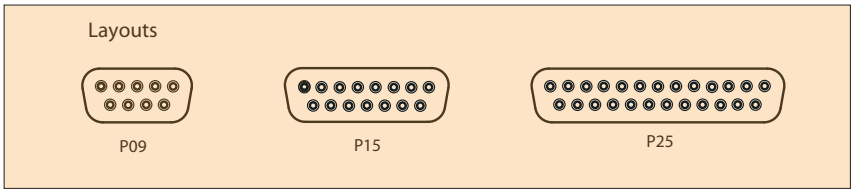

Material: Thermoplastic / steel tin plated

| Item number | Cover Size | Poles | L mm | D mm | A mm | B mm | Layout Code |
|---|---|---|---|---|---|---|---|
| SUHV09S | 1 | 9-poles | 25.8 | 3 | 30.8 | 12.5 | S09 |
| SUHV15S | 2 | 15-poles | 33.3 | 3 | 39.1 | 12.5 | S15 |
| SUHV25S | 3 | 25-poles | 47.0 | 3 | 53.0 | 12.5 | S25 |

Electrical, thermal ,mechanical properties: chapter: 3.1.1

### 3.2.4 Pin housing D-SUB TRAC H



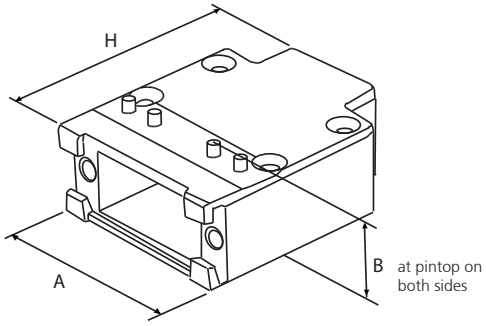




Material: Thermoplastic / steel tin plated

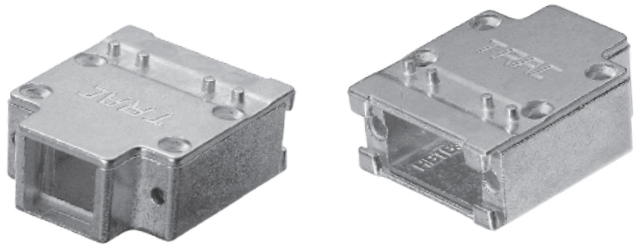
| Item number | Cover Size | Poles | L mm | D mm | A mm | B mm | Layout Code |
|---|---|---|---|---|---|---|---|
| SUHV09P | 1 | 9-poles | 25.8 | 3 | 30.8 | 12.5 | P09 |
| SUHV15P | 2 | 15-poles | 33.3 | 3 | 39.1 | 12.5 | P15 |
| SUHV25P | 3 | 25-poles | 47.0 | 3 | 53.0 | 12.5 | P25 |

Electrical, thermal ,mechanical properties: chapter: 3.1.1

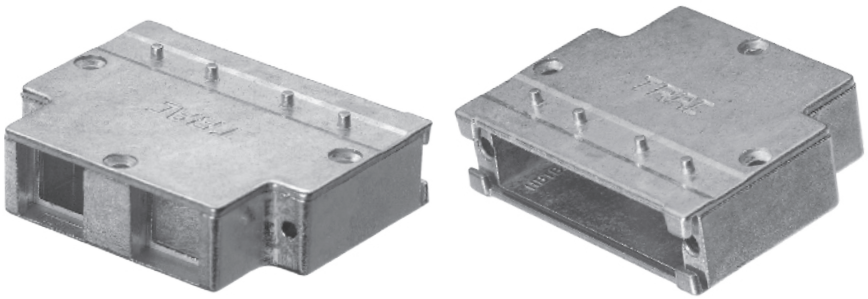
### 3.2.5 Covers D-SUB




**a**



**b**

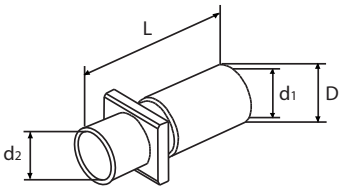


Material: Zinc cast (self passivating)

| Item number | Cover | A mm | B mm | H mm | Cable entrances | Illustration |
|---|---|---|---|---|---|---|
| HBTB 316238 P0091/92 | size 1 | 31.0 | 17.9 | 37.6 | 1 | a |
| HBTB 316238 P0151/152 | size 2 | 39.3 | 17.9 | 37.6 | 1 | a |
| HBTB 316238 P0251/252 | size 3 | 53.3 | 17.9 | 37.6 | 2 | b |

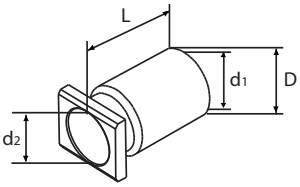
## 3.2.6 *Cable clamps / shielding sleeves / wire hole plugs*

### Cable clamps




Material: Brass tin-plated

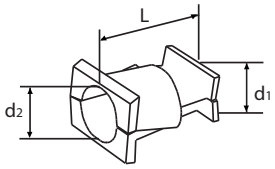
| Item number | D mm | d1 mm | d2 mm | L mm | External diameter of cable (mm) | Strain relief compression | Shield compression |
|---|---|---|---|---|---|---|---|
| SUKABC06S | 7.4 | 6.0 | 6.0 | 20.5 | 5.8 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC067S | 7.4 | 6.7 | 6.0 | 20.5 | 6.5 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC09S | 10..0 | 9.0 | 9.0 | 20.4 | 8.8 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC10S | 11.0 | 10.0 | 9.0 | 30.4 | 9.8 $^{+0}/_{-0.8}$ | yes | yes |




Material: Brass tin-plated

| Item number | D mm | d1 mm | d2 mm | L mm | External diameter of cable (mm) | Strain relief compression | Shield compression |
|---|---|---|---|---|---|---|---|
| SUKABC12 | 13.0 | 12.0 | 10.0 | 22.4 | 11.8 $^{+0}/_{-0.8}$ | yes | no |
| SUKABC12X | 13.5/14.0 | 12.0 | 10.0 | 29.4 | 11.8 $^{+0}/_{-0.8}$ | yes | yes* |

* With internal shieldbushing. Item no. SUGSC375

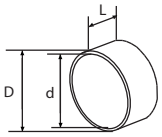



Material: zinc cast (self passivating)

| Item number | d1 mm | d2 mm | L mm | External diameter of cable (mm) | Strain relief | Shield compression |
|---|---|---|---|---|---|---|
| SUKABV69 | 6-9 | 6-9 | 18.0 | 9 $^{+0}/_{-3.0}$ | yes* | no |

* with cable tie SUKABV69K

### Shielding sleeves / supporting sleeves

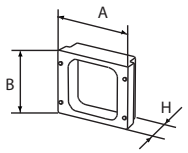



Material: Bronze tin-plated

| Item number | For cable clamp | d mm | D mm | L mm | colour |
|---|---|---|---|---|---|
| SUGSC297 | SUKABC06S<br>SUKABC067S | 7.5 | 8.5 | 6.4 | green |
| SUGSC460 | SUKABC09S<br>SUKABC10S | 11.7 | 13.0 | 6.4 | silver |
| SUGSC375* | SUKABC12X | 9.5 | 10.3 | 6.4 | yellow |

* Supporting sleeve for internal shielding at SUKABC12X

### Wire hole plugs

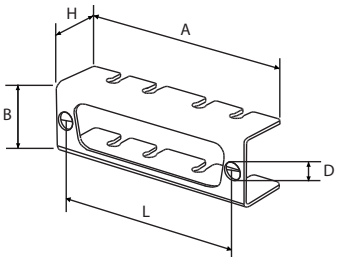



Material: Zinc cast (self passivating)

| Item number | Description | A mm | B mm | H mm |
|---|---|---|---|---|
| SUBL | Wire hole plug to close the non used cable entrances | 14 | 12 | 5 |

## *3.2.7 Coding plates / coding slides / Fixing plates*

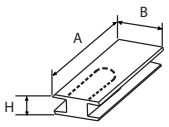
### Coding plates




Material: Stainless steel

| Item number | size | A mm | B mm | H mm | L mm | D mm |
|---|---|---|---|---|---|---|
| SUCB1 | 1 | 31.0 | 17.0 | 14.8 | 25.0 | 4.1 |
| SUCB2 | 2 | 39.5 | 17.0 | 14.8 | 33.3 | 4.1 |
| SUCB3 | 3 | 53.0 | 17.0 | 14.8 | 47.0 | 4.1 |

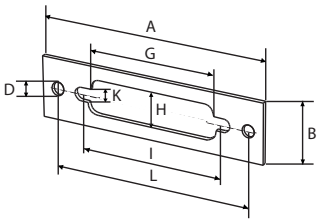
### Coding slides




Material: Polyamide

| Item number | A mm | B mm | H mm |
|---|---|---|---|
| SUCR | 12.0 | 4.0 | 1.6 |

### Fixing plates




Material: Stainless steel
Material thickness: 1.5mm

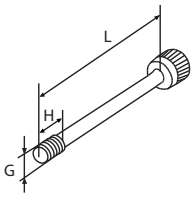
| Item number | Reducing plate | A mm | B mm | L mm | D mm | G mm | H mm | I mm | K mm |
|---|---|---|---|---|---|---|---|---|---|
| SUBB1 | | 51.0 | 20.0 | 41.0 | 4.0 | 20.0 | 11.0 | 25.0 | 4.1 |
| SUBB2 | | 60.0 | 20.0 | 50.0 | 4.0 | 28.0 | 11.0 | 33.3 | 4.1 |
| SUBB3 | | 73.0 | 20.0 | 63.0 | 4.0 | 42.0 | 11.0 | 47.0 | 4.1 |
| SUBB21 | 2 to 1* | 60.0 | 20.0 | 50.0 | 4.0 | 20.0 | 11.0 | 25.0 | 4.1 |
| SUBB31 | 3 to 1* | 73.0 | 20.0 | 63.0 | 4.0 | 20.0 | 11.0 | 25.0 | 4.1 |
| SUBB32 | 3 to 2* | 73.0 | 20.0 | 63.0 | 4.0 | 28.0 | 11.0 | 33.3 | 4.1 |

* Reducing fixing plates for smaller D-SUB housing application

## 3.2.8 *Screws / spring washers*

**Plug screws (hex, socket screws)**

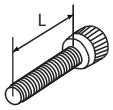
Material: Stainless steel




| Item number | G thread | L mm | H mm | surface treatment |
|---|---|---|---|---|
| SUI6KT M3x34 | M3 | 34.0 | 6.0 | Molykott coated |
| SUI6KT M3x32.4 | M3 | 32.4 | 6.0 | Molykott coated |
| SUI6KT 4-40UNCx34 | 4-40UNC | 34.0 | 6.0 | browned |
| SUI6KT 4-40UNCx32.4 | 4-40UNC | 32.4 | 6.0 | browned |

**Receptacle screws(hex, socket screws)**

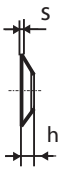
Material: Stainless steel

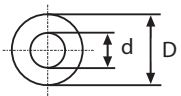



| Item number | thread | L mm |
|---|---|---|
| SUI6KT M2.5x20 | M2.5 | 20.0 |

**Spring washer for plug- /receptacle- screws:**

Material: Stainless steel

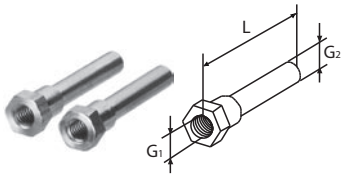


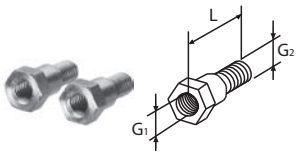

| Item number | D mm | d mm | h mm | s mm |
|---|---|---|---|---|
| SUSN212748 M2.5 | 51 | 2.7 | 0.40 | 0.2 |
| SUSN212748 M3 | 5.7 | 3.2 | 0.45 | 0.3 |

**Receptacle fixing screws, nuts**

a




b




Material: Stainless steel

| Item number | L mm | G1 thread | G2 thread | image |
|---|---|---|---|---|
| SUB21 | 21.3 | M3 inside | M2.5 inside | a |
| SUB11 | 11.0 | M3 inside | M3 outside | b |

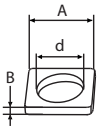
Hex. nut to SUB11: SUM6KT M3

## Screws for covers


Material: Stainless steel

| Item number | Description | G thread | L mm |
|---|---|---|---|
| SUCH M2.5x5 | Thread-cutting countersunk cross-head screw | M2.5 | 5.0 |

## Square washers




| Item number | A mm | d mm | B mm | Material |
|---|---|---|---|---|
| SUUQ1.0 | 6.0 | 4.1 | 1.0 | Stainless steel |
| SUUQ1.5 | 6.0 | 4.1 | 1.5 | Stainless steel p-galvanised, yellow |

## 3.2.9 D-SUB Contacts

### Data-Signal-Socket contacts HD20

Material: Cu Sn (tin bronze)

| Item number | Description | Section (mm²) | Contact surface / surface of contact zone |
|---|---|---|---|
| SUPCS20-24AU2 | Single contact | 0.2 - 0.56 (AWG24-20) | gold-plated / ≥ 0.8 µm Au auf 1.3 µm Ni |
| SUPCS20-24AU2-5 | Contact strip, reel with 500 pcs | 0.2 - 0.56 (AWG24-20) | gold-plated / ≥ 0.8 µm Au auf 1.3 µm Ni |
| SUPCS20-24AU2-125 | Contact strip, reel with 12500 pcs | 0.2 - 0.56 (AWG24-20) | gold-plated / ≥ 0.8 µm Au auf 1.3 µm Ni |

### Power-Socket contacts size 8

Material: Cu alloy

| Item number | Description | Section (mm²) | Contact surface / surface of contact zone |
|---|---|---|---|
| SUMCS8-18AU1 | Single contact | 0.8 - 1.4 (AWG18-16) | gold-plated / ≥ 1.3 µm Au auf 1.3 µm Ni |
| SUMCS8-14AU1 | Single contact | 2.0 - 3.0 (AWG14-13) | gold-plated / ≥ 1.3 µm Au auf 1.3 µm Ni |
| SUMCS8-11AU1 | Single contact | 5.0 (AWG11) | gold-plated / ≥ 1.3 µm Au auf 1.3 µm Ni |
| SUMCS8-8AU1 | Single contact | 8.0 (AWG8) | gold-plated / ≥ 1.3 µm Au auf 1.3 µm Ni |

### Data-Signal-Pin contacts HD20

Material: Cu Sn (tin bronze)

| Item number | Description | Section (mm²) | Contact surface / surface of contact zone |
|---|---|---|---|
| SUPCP20-24AU2 | Single contact | 0.2 - 0.56 (AWG24-20) | gold-plated / ≥ 0.8 µm Au on 1.3 µm Ni |
| SUPCP20-24AU2-5 | Contact strip, reel with 500 pcs | 0.2 - 0.56 (AWG24-20) | gold-plated / ≥ 0.8 µm Au on 1.3 µm Ni |
| SUPCP20-24AU2-125 | Contact strip, reel with 12500 pcs | 0.2 - 0.56 (AWG24-20) | gold-plated / ≥ 0.8 µm Au on 1.3 µm Ni |

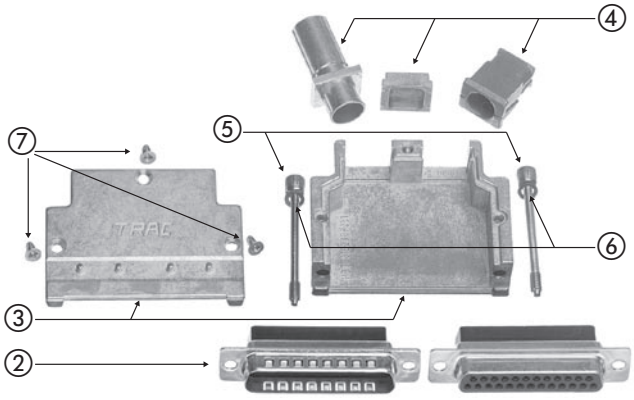
### Power-Pin contacts size 8

Material: Cu alloy

| Item number | Description | Section (mm²) | Contact surface / surface of contact zone |
|---|---|---|---|
| SUMCP8-18AU1 | Single contact | 0.8 - 1.4 (AWG18-16) | gold-plated / ≥ 1.3 µm Au on 1.3 µm Ni |
| SUMCP8-14AU1 | Single contact | 2.0 - 3.0 (AWG14-13) | gold-plated / ≥ 1.3 µm Au on 1.3 µm Ni |
| SUMCP8-11AU1 | Single contact | 5.0 (AWG11) | gold-plated / ≥ 1.3 µm Au on 1.3 µm Ni |
| SUMCP8-8AU1 | Single contact | 8.0 (AWG8) | gold-plated / ≥ 1.3 µm Au on 1.3 µm Ni |

## 3.3 D-SUB Connector sets, TRAC

### *3.3.1 Plug set TRACST*



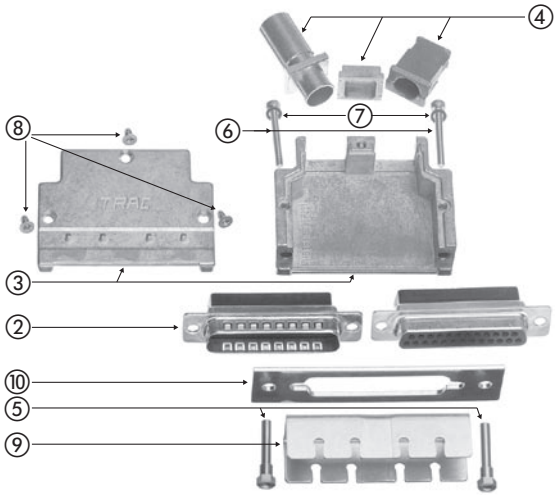

| Pos. | Description | Item number | Qty. | Set code configuration Size 1 | Size 2 | Size 3 |
|---|---|---|---|---|---|---|
| 1 | D-SUB plug set | TRACST | | **TRACST** | **TRACST** | **TRACST** |
| 2 * | Socket housing 9-poles | SUH09S | 1 | **S09** | | |
| | Socket housing 15-poles | SUH15S | 1 | | **S15** | |
| | Socket housing 25-poles | SUH25S | 1 | | | **S25** |
| | Pin housing 9-poles | SUH09P | 1 | **P09** | | |
| | Pin housing 15-poles | SUH15P | 1 | | **P15** | |
| | Pin housing 25-poles | SUH25P | 1 | | | **P25** |
| 3 | Cover | HBTB 316238 | 1 | P0091/92 | P0151/152 | P0251/252 |
| 4 | No. of cable entrances per cover | | | 1 | 1 | 2 |
| | Cable clamp Di = 6mm | SUKABC06S | | | **C06S** | |
| | Cable clamp Di = 6.7mm | SUKABC067S | | | **C067S** | |
| | Cable clamp Di = 9mm | SUKABC09S | | | **C09S** | |
| | Cable clamp Di = 10mm | SUKABC10S | | | **C10S** | |
| | Cable clamp Di = 12mm | SUKABC12 | | | **C12** | |
| | Cable clamp Di = 12mm | SUKABC12X | | | **C12X** | |
| | Cable clamp Di = 6 -9mm | SUKABV69 | | | **V69** | |
| | Wire hole plugs | SUBL | | | **BL** | |
| 5 | Screw M3x34mm | SUI6KT M3x34 | 2 | | **1** | |
| | Screw M3x32.4mm | SUI6KT M3x32.4 | 2 | | **2** | |
| | Screw 40UNC-2Ax34 | SUI6KT 4-40UNC | 2 | | **3** | |
| | Screw 4-40UNC-2Ax32.4 | SUI6KT 4-40UNCx32.4 | 2 | | **4** | |
| 6 | Spring washer M3 | SUSN212748 M3 | 2 | | - | |
| 7 | Screw M2.5x5mm | SUCH M2.5x5 | 3 / 4 | | - | |

* Layoutcode for special layouts: socket housing chapter 3.2.1 / pin housing chapter 3.2.2

**Ordering example**
D-SUB plug (**TRACST**), 25-pole/socket housing (**S25**), cable clamp SUKABC12 (**C12**), wire hole plug (**BL**), screw M3 x 34mm (**1**) = Item number.: **TRACSTS25C12BL1**

Contacts and Shielding sleeves for crimping EMC braids to cable clamp have to be ordred seperately according individual requirements..
Shielding sleeves: chapter 3.2.6
Contacts: chapter 3.2.9

### 3.3.2 *Receptacle set TRACDO*



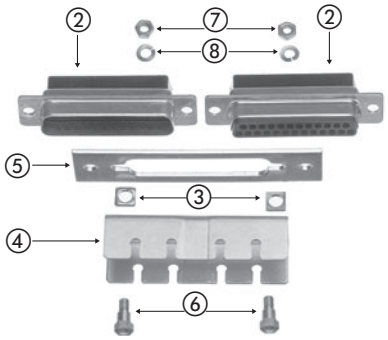

| | | | | Set code configuration | | |
|---|---|---|---|---|---|---|
| **Pos.** | **Description** | **Item number** | **Qty.** | **Size 1** | **Size 2** | **Size 3** |
| 1 | D-SUB receptacle set | TRACDO | | **TRACDO** | **TRACDO** | **TRACDO** |
| 2 * | Socket housing 9-poles | SUH09S | 1 | **S09** | | |
| | Socket housing 15-poles | SUH15S | 1 | | **S15** | |
| | Socket housing 25-poles | SUH25S | 1 | | | **S25** |
| | Pin housing 9-poles | SUH09P | 1 | **P09** | | |
| | Pin housing 15-poles | SUH15P | 1 | | **P15** | |
| | Pin housing 25-poles | SUH25P | 1 | | | **P25** |
| 3 | Cover | HBTB 316238 | 1 | P0091/92 | P0151/152 | P0251/252 |
| 4 | No. of cable entrances | | | 1 | 1 | 2 |
| | Cable clamp Di = 6mm | SUKABC06S | | | **C06S** | |
| | Cable clamp Di = 6.7mm | SUKABC067S | | | **C067S** | |
| | Cable clamp Di = 9mm | SUKABC09S | | | **C09S** | |
| | Cable clamp Di = 10mm | SUKABC10S | | | **C10S** | |
| | Cable clamp Di = 12mm | SUKABC12 | | | **C12** | |
| | Cable clamp Di = 12mm | SUKABC12X | | | **C12X** | |
| | Cable clamp Di = 6 -9mm | SUKABV69 | | | **V69** | |
| | Wire hole plug | SUBL | | | **BL** | |
| 5 | Bolt large | SUB21 | 2 | | - | |
| 6 | Screw M2.5x20mm | SUI6KT M2.5x20 | 2 | | - | |
| 7 | Spring washer M2.5 | SUSN212748 M2.5 | 2 | | - | |
| 8 | Screw M2.5x5mm | SUCH M2.5x5 | 4 / 3 | | - | |
| 9 | Coding plate | SUCB1 / SUCB2 / SUCB3 | 1 | | - | |
| 10 | Fixing plate | SUBB1 / SUBB2 / SUBB3 | 1 | | - | |

* Layoutcode for special layouts: socket housing chapter 3.2.1 / pin housing chapter 3.2.2

**Ordering example:**
D-SUB receptacle (**TRACDO**), 25-pole/pin housing (**P25**), cable clamp SUKABC10S (**C10S**), cable clamp SUKABC12 (**C12**) = Item number.: **TRACDOP25C10SC12**

Contacts and Shielding sleeves for crimping EMC braids to cable clamp have to be ordred seperately according individual requirements.
Shielding sleeves: chapter 3.2.6
Contacts: chapter 3.2.9

### 3.3.3 *Mounting strip TRACBE for direct fixation to casings/boards*




| | | | | Set code configuration | | |
|---|---|---|---|---|---|---|
| **Pos.** | **Description** | **Item number** | **Qty.** | **Size 1** | **Size 2** | **Size 3** |
| 1 | D-SUB mounting strip | TRACBE | | **TRACBE** | **TRACBE** | **TRACBE** |
| 2 * | Socket housing 9-poles | SUH09S | 1 | **S09** | | |
| | Socket housing 15-poles | SUH15S | 1 | | **S15** | |
| | Socket housing 25-poles | SUH25S | 1 | | | **S25** |
| | Pin housing 9-poles | SUH09P | 1 | **P09** | | |
| | Pin housing 15-poles | SUH15P | 1 | | **P15** | |
| | Pin housing 25-poles | SUH25P | 1 | | | **P25** |
| 3 | Square washer 6x6x1.0mm | SUUQ1.0 | 2 | **U1.0** | **U1.0** | **U1.0** |
| | Square washer 6x6x1.5mm | SUUQ1.5 | 2 | **U1.5** | **U1.5** | **U1.5** |
| 4 | Coding plate | SUCB1 / SUCB2 / SUCB3 | 1 | | - | |
| 5 | Fixing plate | SUBB1 / SUBB2 / SUBB3 | 1 | | - | |
| 6 | Bolt, small | SUB11 | 2 | | - | |
| 7 | Hexagonal nut | SUM6KT M3 | 2 | | - | |
| 8 | Spring washer | SUSN212748 M3 | 2 | | - | |

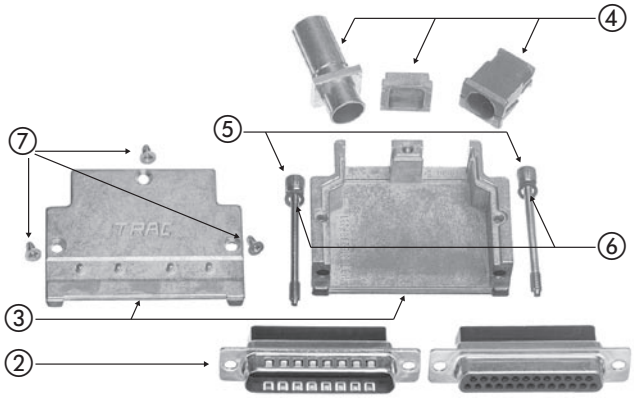
* Layoutcode for special layouts: socket housing chapter 3.2.1 / pin housing chapter 3.2.2

**Ordering example:**
D-SUB mounting strip (**TRACBE**), 25-pole/pin housing (**P25**), Unterlagscheibe 1.5 mm (**U1.5**)
= Item number: **TRACBEP15U1.5**

Contacts have to be ordred seperately according individual requirements.
Contacts: chapter 3.2.9

## 3.4 D-SUB Connector sets, TRAC H for increased voltage requirements

### *3.4.1 Plug set TRACHST*

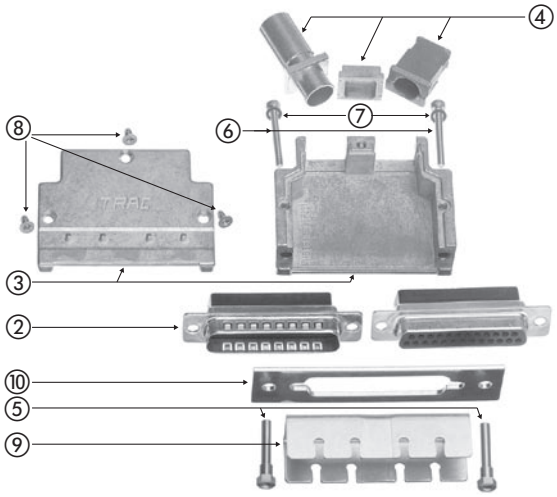



| Pos. | Description | Item number | Qty. | Set code configuration Size 1 | Size 2 | Size 3 |
|---|---|---|---|---|---|---|
| 1 | D-SUB plug set | TRACHST | | **TRACHST** | **TRACHST** | **TRACHST** |
| 2 | Socket housing 9-poles | SUHV09S | 1 | **S09** | | |
| | Socket housing 15-poles | SUHV15S | 1 | | **S15** | |
| | Socket housing 25-poles | SUHV25S | 1 | | | **S25** |
| | Pin housing 9-poles | SUHV09P | 1 | **P09** | | |
| | Pin housing 15-poles | SUHV15P | 1 | | **P15** | |
| | Pin housing 25-poles | SUHV25P | 1 | | | **P25** |
| 3 | Cover | HBTB 316238 | 1 | P0091/92 | P0151/152 | P0251/252 |
| 4 | No. of cable entrances per cover | | | 1 | 1 | 2 |
| | Cable clamp Di = 6mm | SUKABC06S | | | **C06S** | |
| | Cable clamp Di = 6.7mm | SUKABC067S | | | **C067S** | |
| | Cable clamp Di = 9mm | SUKABC09S | | | **C09S** | |
| | Cable clamp Di = 10mm | SUKABC10S | | | **C10S** | |
| | Cable clamp Di = 12mm | SUKABC12 | | | **C12** | |
| | Cable clamp Di = 12mm | SUKABC12X | | | **C12X** | |
| | Cable clamp Di = 6 -9mm | SUKABV69 | | | **V69** | |
| | Wire hole plugs | SUBL | | | **BL** | |
| 5 | Screw M3x34mm | SUI6KT M3x34 | 2 | | **1** | |
| | Screw M3x32.4mm | SUI6KT M3x32.4 | 2 | | **2** | |
| | Screw 40UNC-2Ax34 | SUI6KT 4-40UNC | 2 | | **3** | |
| | Screw 4-40UNC-2Ax32.4 | SUI6KT 4-40UNCx32.4 | 2 | | **4** | |
| 6 | Spring washer M3 | SUSN212748 M3 | 2 | | - | |
| 7 | Screw M2.5x5mm | SUCH M2.5x5 | 3 / 4 | | - | |

**Ordering example**
D-SUB plug (**TRACHST**), 25-pole/socket housing (**S25**), cable clamp SUKABC12 (**C12**), wire hole plug (**BL**), screw M3 x 34mm (**1**) = Item number.: **TRACHSTS25C12BL1**

Contacts and Shielding sleeves for crimping EMC braids to cable clamp have to be ordred seperately according individual requirements.
Shielding sleeves: chapter 3.2.6
Contacts: chapter 3.2.9

### 3.4.2 Receptacle set TRACHDO

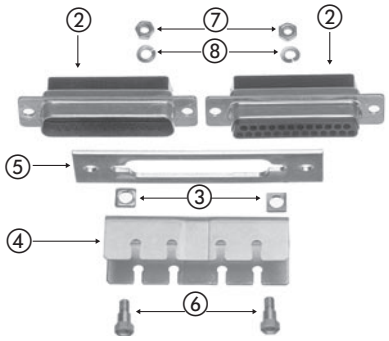



| | | | | Set code configuration | | |
|---|---|---|---|---|---|---|
| **Pos.** | **Description** | **Item number** | **Qty.** | **Size 1** | **Size 2** | **Size 3** |
| 1 | D-SUB receptacle set | TRACHDO | | **TRACHDO** | **TRACHDO** | **TRACHDO** |
| 2 | Socket housing 9-poles | SUHV09S | 1 | **S09** | | |
| | Socket housing 15-poles | SUHV15S | 1 | | **S15** | |
| | Socket housing 25-poles | SUHV25S | 1 | | | **S25** |
| | Pin housing 9-poles | SUHV09P | 1 | **P09** | | |
| | Pin housing 15-poles | SUHV15P | 1 | | **P15** | |
| | Pin housing 25-poles | SUHV25P | 1 | | | **P25** |
| 3 | Cover | HBTB 316238 | 1 | P0091/92 | P0151/152 | P0251/252 |
| 4 | No. of cable entrances | | | 1 | 1 | 2 |
| | Cable clamp Di = 6mm | SUKABC06S | | | **C06S** | |
| | Cable clamp Di = 6.7mm | SUKABC067S | | | **C067S** | |
| | Cable clamp Di = 9mm | SUKABC09S | | | **C09S** | |
| | Cable clamp Di = 10mm | SUKABC10S | | | **C10S** | |
| | Cable clamp Di = 12mm | SUKABC12 | | | **C12** | |
| | Cable clamp Di = 12mm | SUKABC12X | | | **C12X** | |
| | Cable clamp Di = 6 -9mm | SUKABV69 | | | **V69** | |
| | Wire hole plug | SUBL | | | **BL** | |
| 5 | Bolt large | SUB21 | 2 | | - | |
| 6 | Screw M2.5x20mm | SUI6KT M2.5x20 | 2 | | - | |
| 7 | Strain washer M2.5 | SUSN212748 M2.5 | 2 | | - | |
| 8 | Screw M2.5x5mm | SUCH M2.5x5 | 4 / 3 | | - | |
| 9 | Coding plate | SUCB1 / SUCB2 / SUCB3 | 1 | | - | |
| 10 | Fixing plate | SUBB1 / SUBB2 / SUBB3 | 1 | | - | |

**Ordering example:**
D-SUB receptacle (**TRACHDO**), 25-pole/pin housing (**P25**), cable clamp SUKABC10S (**C10S**), cable clamp SUKABC12 (**C12**) = Item number.: **TRACHDOP25C10SC12**

Contacts and Shielding sleeves for crimping EMC braids to cable clamp have to be ordred seperately according individual requirements.
Shielding sleeves: chapter 3.2.6
Contacts: chapter 3.2.9

### 3.4.3 *Mounting strip TRACHBE for direct fixation to casing/boards*



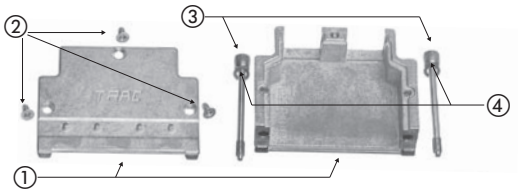

| Pos. | Description | Item number | Qty. | Set code configuration | | |
|---|---|---|---|---|---|---|
| | | | | Size 1 | Size 2 | Size 3 |
| 1 | D-SUB mounting strip | TRACHBE | | **TRACHBE** | **TRACHBE** | **TRACHBE** |
| 2 * | Socket housing 9-poles | SUHV09S | 1 | **S09** | | |
| | Socket housing 15-poles | SUHV15S | 1 | | **S15** | |
| | Socket housing 25-poles | SUHV25S | 1 | | | **S25** |
| | Pin housing 9-poles | SUHV09P | 1 | **P09** | | |
| | Pin housing 15-poles | SUHV15P | 1 | | **P15** | |
| | Pin housing 25-poles | SUHV25P | 1 | | | **P25** |
| 3 | Square washer 6x6x1.0mm | SUUQ1.0 | 2 | **U1.0** | **U1.0** | **U1.0** |
| | Square washer 6x6x1.5mm | SUUQ1.5 | 2 | **U1.5** | **U1.5** | **U1.5** |
| 4 | Coding plate | SUCB1 / SUCB2 / SUCB3 | 1 | - | | |
| 5 | Fixing plate | SUBB1 / SUBB2 / SUBB3 | 1 | - | | |
| 6 | Bolt, small | SUB11 | 2 | - | | |
| 7 | Hexagonal nut | SUM6KT M3 | 2 | - | | |
| 8 | Spring washer | SUSN212748 M3 | 2 | - | | |

**Ordering example:**
D-SUB mounting strip (**TRACHBE**), 25-pole/pin housing (**P25**), Unterlagscheibe 1.5 mm (**U1.5**)
= Item number: **TRACHBEP15U1.5**

Contacts have to be ordred seperately according individual requirements.
Contacts: chapter 3.2.9

## 3.5 D-SUB Cover set

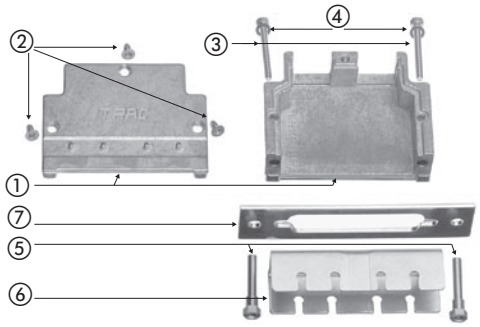
### *3.5.1 Plug cover set TRACST*




| Pos. | Description | Item number | Qty. | Set code configuration Size 1 | Size 2 | Size 3 |
|---|---|---|---|---|---|---|
| | D-SUB plug cover set | TRACST | | **TRACST** | **TRACST** | **TRACST** |
| 1 | Cover size 1 | HBTB 316238 P0091/92 | 1 | **1** | | |
| | Cover size 2 | HBTB 316238 P0151/152 | 1 | | **2** | |
| | Cover size 3 | HBTB 316238 P0251/252 | 1 | | | **3** |
| 2 | Screw M2.5x5mm | SUCH M2.5x5 | 4 / 3 | - | | |
| 3 | Screw M3x34mm | SUI6KT M3x34 | 2 | **1** | | |
| | Screw M3x32.4mm | SUI6KT M3x32.4 | 2 | **2** | | |
| | Screw 4-40UNC-2Ax34mm | SUI6KT 4-40UNCx34 | 2 | **3** | | |
| | Screw 4-40UNC-2Ax32.4mm | SUI6KT 4-40UNCx32.4 | 2 | **4** | | |
| 4 | Spring washer M3 | SUSN212748 M3 | 2 | - | | |

**Ordering example:**
D-SUB plug (**TRACST**), size 1 (**1**), screw M3 x 34mm (**1**) = Item number: **TRACST1-1**
Other components have to be ordered seperately according individual requirements

### *3.5.2 Receptacle cover set TRACDO*




| Pos. | Item number | Art. No. | Qty. | Set code configuration Size 1 | Size 2 | Size 3 |
|---|---|---|---|---|---|---|
| | D-SUB socket cover set | TRACDO | | **TRACDO** | **TRACDO** | **TRACDO** |
| 1 | Cover size 1 | HBTB 316238 P0091/92 | 1 | **1** | | |
| | Cover size 2 | HBTB 316238 P0151/152 | 1 | | **2** | |
| | Cover size 3 | HBTB 316238 P0251/252 | 1 | | | **3** |
| 2 | Screw M2.5x5mm | SUCH M2.5x5 | 4 / 3 | - | | |
| 3 | Screw M2.5x20mm | SSUI6KT M2.5x20 | 2 | - | | |
| 4 | Strain washer M2.5 | SUSN212748 M2.5 | 2 | - | | |
| 5 | Bolt, large | SUB21 | 2 | - | | |
| 6 | Coding plate size 1 - 3 | SUCB1 / SUCB2 / SUCB3 | 1 | - | | |
| 7 | Fixing plate size 1 -3 | SUBB1 / SUBB2 / SUBB3 | 1 | - | | |

**Ordering example:**
D-SUB plug (**TRACDO**), size 1 (**1**) = Item number: **TRACDO1**
Other components have to be ordered seperately according individual requirements

## 3.6 Tools for D-SUB TRAC / TRAC H

### *3.6.1 Compression tool for cable clamps and shielding sleeves*

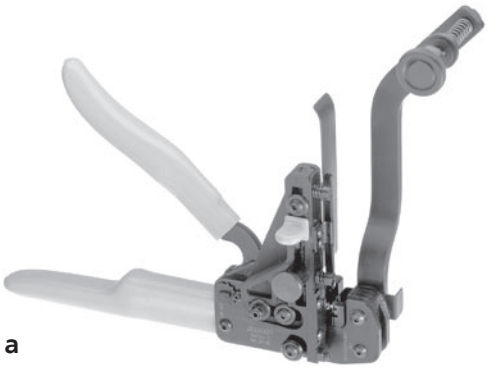
**Mechanical hand compression tool**

| Item number | Twin-Die for strain relief and shield compression | for cable clamp | for shielding sleeve |
|---|---|---|---|
| GIW30L | GIM30K06 | SUKABC06S | SUGSC297 |
| GIW30L | GIM30K06 | SUKABC067S | SUGSC297 |
| GIW30L | GIM30K09 | SUKABC09S | SUGSC460 |
| GIW30L | GIM30K10 | SUKABC10S | SUGSC460 |
| GIW30L | GIM30K09 / GIM30K10 / GIM30K12 * | SUKABC12 | - |
| GIW30L | GIM30K09 / GIM30K10 / GIM30K12 * | - | SUGSC357 |

* One of the mentioned dies can be used for cable clamp and shielding sleeves.
Tools for SUKABC12X on request

### *3.6.2 Crimping tool for contacts*

**Crimping tool for datasignal contacts (HD20)**



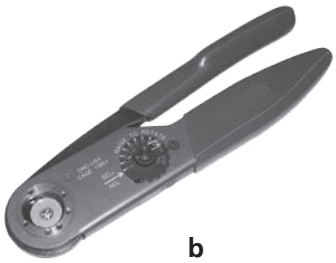
a

b

| Item number crimping tool | Item number presshead | Mechanical crimping tool for | Item number contacts | image |
|---|---|---|---|---|
| GIW10V | GIM10VHD20 | Single socket contact | SUPCS20-24AU2 | b |
| 169424-1 | | Socket contact strip, reel with 500 pcs | SUPCS20-24AU2-5 | a |
| on request | | Socket contact strip, reel with 12500 pcs | SUPCS20-24AU2-125 | - |
| GIW10V | GIM10VHD20 | Single pin contact | SUPCP20-24AU2 | b |
| 169424-1 | | Pin contact strip, reel with 500 pcs | SUPCP20-24AU2-5 | a |
| on request | | Pin contact strip, reel with 12500 pcs | SUPCP20-24AU2-125 | - |

**Crimpingtool for power contacts size 8**

a



b

| Item number Crimpingtool | Item number Locator | Item number contacts | Contact type | Section (mm²) | Illustration |
|---|---|---|---|---|---|
| M300BT | SP689 | SUMCS8-8AU1 | Socket contact | 8.0 | a |
| M300BT | SP689 | SUMCS8-11AU1 | Socket contact | 5.0 | a |
| M300BT | SP689 | SUMCS8-14AU1 | Socket contact | 2.0 - 3.0 | a |
| FT8 | TP731 | SUMCS8-18AU1 | Socket contact | 0.8 - 1.4 | b |
| M300BT | SP689 | SUMCP8-8AU1 | Pin contact | 8.0 | a |
| M300BT | SP689 | SUMCP8-11AU1 | Pin contact | 5.0 | a |
| M300BT | SP689 | SUMCP8-14AU1 | Pin contact | 2.0 - 3.0 | a |
| FT8 | TP731 | SUMCP8-18AU1 | Pin contact | 0.8 - 1.4 | b |

### *3.6.3 Insertion and extraction tools*

**Extraction-/insertion tool for contacts (HD20)**

| Item number | Description | Contact type |
|---|---|---|
| WMLEI GR20 | Insertion- /extraction tool for contacts size 20 | SUPCS20 / SUPCP20 |

**Extraction-tool for contacts (size 8)**

| Item number | Description | Contact type |
|---|---|---|
| WMLE GR8 | Extraction-tool for contacts size 8 | SUMCS8 / SUMCP8 |

### 3.6.4 *Supporting Tools*

**Cutting pliers for removing coding pins**

| Item number | Description |
|---|---|
| GIW901 | Tool for cutting of the coding pins on the cover (special shape of cutting head) |

**Coding tool**

| Item number | Description |
|---|---|
| GIW902 | Tool for inserting coding slides into coding plate |

**Hex.socket screw driver for fixing screws**

| Item number | Description |
|---|---|
| GIW903 | Tool for tightening the hex. socket screws M3 |

## 3.7 Assembly instructions D-SUB TRAC / TRAC H

### *3.7.1 Preparation*

**Standard Part sets**

Standard part sets conclude all single parts except shielding sleeves, contacts, shrinkable tubes cable ties.

| | | | | |
|---|---|---|---|---|
| Following parts sets are available in 3 sizes: | Connectors | TRACST | and | TRACHST |
| | Receptacles | TRACDO | and | TRACHDO |
| | Mountig strips | TRACBE | and | TRACHBE |

Appart from standard TRAC/TRACH contact housings for 9-, 15-, and 25-pole size HD20 contacts (pins/sockets) other arangements and combinations with size 8 power contacts are available on request. (see 3.2)

**Contacts**

Contacts are to be selected according to the relevant informations in this catalogue:
- Contact insert (Contact arrangement/Contact number) (acc. 3.2.1 - 3.2.4)
- Contact type **Pin** (P) or **Socket** (S) (acc. 3.2.9)
- Conductor cross section (acc. 3.2.9)
- Manufacturing mode (single contacts - on reels)
- Electrical properties (acc. 3.1.1)

**Shielding sleeves**

Shielding sleeves are to be selected depending on the cable clamps. (acc. 3.2.6)

| **Item number Cable clamp** | **requires shielding sleeve** | **Colour** |
|---|---|---|
| SUKABC06S | SUGSC297 | green |
| SUKABC067S | SUGSC297 | green |
| SUKABC09S | SUGSC460 | silver |
| SUKABC10S | SUGSC460 | silver |
| SUKABC12X | SUGSC375 | yellow |

**Tools**

Compression Tools for cable clamps (see 3.6.1)
Compression Tools for shielding sleeves (see 3.6.1)
Crimping Tools for contacts (see 3.6.2)
Supporting Tools (see 3.6.3 - 3.6.4)

Moreover the following standard tools are recommended:
- Crosshead-screwdriver
- Cable stripper
- Knife
- Plastic hammer

**Accomplishing Material** (optional)

- Cable tie SUKBV69K to cable clamp SUKABV69 (see 3.7.2)
- Heat shrinkable tubes to single conductor bundles (see 3.7.2)
- Heat shrinkable tubes for diameter adaption (see 3.7.2)
- Heat shrinkable tubes for conductor identification
- Label for connector identification

## 3.7.2 Cabel set

### Conductor dismanteling

| | | | | | |
|---|---|---|---|---|---|
| Conductor area | A | mm² | 0.2 - 0.56 | 0.8 - 1.4 | 2.0 - 8.0 |
| Disinsulation length | x | mm | 2.5 | 9.5 | 9.5 |
| For contact type | | | HD20 | size 8 | size 8 |

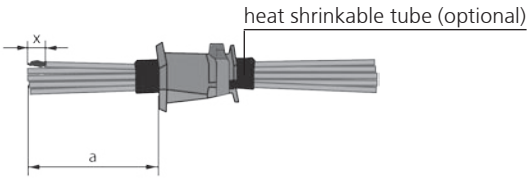
### Single Conductors, non shielded:

Single conductor bundles may be fixed with the divisible cable clamp SUKABV69 for various diameters from 6 up to 9 mm.

- Dismantle Conductors by (x)mm acc. conductor dismanteling table
- A heat shrinkable tube can be applied at the clamping area (optinal)
- Firmly tight the cable clamp with the cable tie SUKBV69K

| | | Cover size 1 | Cover size 2 | Cover size 3 |
|---|---|---|---|---|
| Approximate distance from cable clamp to end of conductors | a | 34 mm | 37 mm | 40 - 55 mm* |

* depending on contact position and used cable entrance of the cover



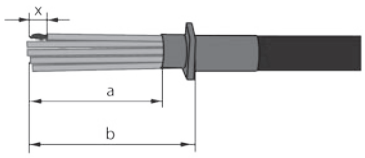

### Multiple Conductor Cable, non shielded:

For adequate strain relieve of non shielded cables the cable clamps SUKABC can be used for 6mm to 12mm cable diameters.

- Dismantle Conductors by (x)mm acc. conductor dismanteling table
- A heat shrinkable tube can be applied at the clamping area to enlarge cable diameters (optinal)

| | | Cover size 1 | Cover size 2 | Cover size 3 |
|---|---|---|---|---|
| Approximate distance from cable clamp shoulder to end of conductors. | a | 34 mm | 37 mm | 40 - 55 mm* |
| Approximate distance from cable insulation to contacts. | b | 40 mm | 43 mm | 46 - 61 mm* |

* depending on contact position and used cable entrance of the cover



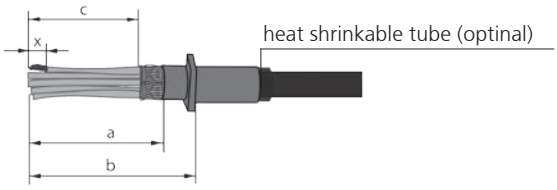
**Multiple Conductors, shielded:**

For adequate strain relieve and and excellent shielding performance the cable clamps SUKABC can be used for 6mm to 12mm cable diameters.

- Dismantle Conductors by (x)mm acc. conductor dismanteling table
- A heat shrinkable tube can be applied at the clamping area to enlarge cable diameters (optinal)

| | | Cover size 1 | Cover size 2 | Cover size 3 |
|---|---|---|---|---|
| Approximate distance from cable clamp end of conductors | a | 34 mm | 37 mm | 40 - 55 mm* |
| Approximate distance from cable insulation to contacts | b | 40 mm | 43 mm | 46 - 61 mm* |
| Approximate distance from shield to contacts | c | 24 mm | 27 mm | 30 - 45 mm* |

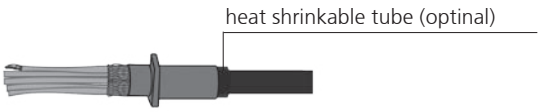
* depending on contact position and used cable entrance of the cover




**Application of Cable Clamp SUKABCxxS for cable retention**

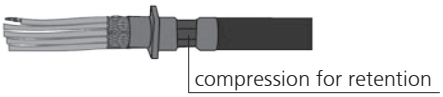
If the overall diameter of the cable is more than 1 mm smaller than the cable clamp inside diameter, the application of a heatshrinkable or filler tube with a length of approx. 25 mm is required. (Img. 1)

(Img. 1)




Compress the retention reach at the cable clamp with the specified tool (acc. to 3.6.1). (Img. 2)

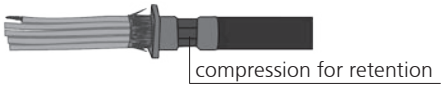
(Img. 2)




**Application of shielding sleeve to Crimping Cable Clamp SUKABCxxS**

- After compression of the cable clamp for cable retention, the shield has to overlap not more than 8 mm from the shield contactation reach
- Fold back the shield over the shield contactation reach (Img.1)
- Set up the shielding sleeve in flush with the end of the cable clamp (Img. 2/3)
- Compress the shielding sleeve with the specified tool (acc. to 3.6.1.) (Img. 4)

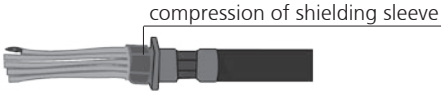
(Img. 1)




(Img. 2)

(Img. 3)

(Img. 4)



**Application of shielding sleeve to Cable Clamp SUKABC12X**

- Fold back the shield over the cable insulation (Img. 1/2)
- Set up the supporting sleeve on the cable and fold the shield back over the supporting sleeve (Img. 2/3)
- Set cable clamp fully over the supporting sleeve (Img. 4/5)
- Compress the cable clamp on the supporting sleeve with the specified tool (acc. to 3.6.1). (Img. 6)
- Compress the strain relieve with the specified tool (acc. to 3.6.1) (Img. 7)

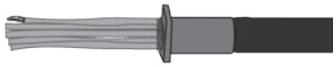
(Img. 1)

(Img. 2)

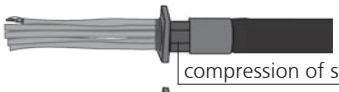
(Img. 3)

(Img. 4)

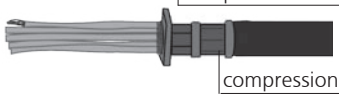
(Img. 5)



(Img. 6)

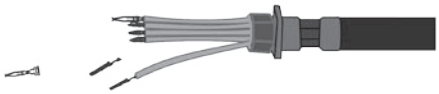



(Img. 7)




**Contact crimping**

| | |
|---|---|
| Contact: | To be crimped with the specified tool. (acc. to 3.6.2) |
| IMPORTANT: | The crimping tool has to be closed completely, that means until the automatic release by the tool. |



**Check**

| | |
|---|---|
| Crimping: | Examine the position and the shape of the crimping |
| Single wires: | No wires must be beyond the crimping slot |
| Contact shape: | Contacts must not be deformed or damaged beyond the crimping reach |

**Heat Shrinkable Tubes, fixing**

| | |
|---|---|
| Optional: | At the connection area of each conductor heat shrinkable tubes for identification and/ or for support or additionall insulation of conductors may be applied. |

## *3.7.3 Assembling*

**Contacts application**

Apply the contacts, corresponding to the contact layout requirement, into the contact housing until they properly click in. Examine the correct contact fixing by slightly pulling each conductor.

**Connector Assembling**

| | |
|---|---|
| Case: | examine regarding residues (eg. wire rests), clean it accordingly |
| Contact housing: | apply to the correct position |
| Cable clamp: | push up against the case (if required use plastic hammer) |
| Wire hole plug: | push up against the case (if required use plastic hammer) |
| Conductors: | check arrangement, put it in adequate order if necessary |
| Cover: | place the cover, it shall suit without special effort<br>apply self-cutting cover screws and tighten them<br>apply fixing screws including the spring washers |
| Optional: | Apply selfadhesive lable for connector identification |
| Optional: | Nipp away polarisation pins from the case acc. to the polarisation plan, place coding slides acc. to the coding plan at the coding plate (use tools acc. 3.6.4) |

# 4 Data Connector TRAC F

## 4.1 Introduction

GIMOTA AG developed the plug-case TRAC F, to carry standard contact-inserts of the types F, DM and H according to EN IEC 60603-2 (DIN 41612). Particularly the assembled plug is conceived for connecting electronic control devices. Each cable-admittance can be equipped with an EMI-shielding of 360°.

The two-piece TRAC F case in zinc-cast allows to connect up to six cables, with an outer diameters of up to 14mm. In addition the case can be coded if necessary, to avoid connecting failures.

For cable diameters up to 12 mm the same cable-clamps are used as with the data plugs D-SUB TRAC. The same compression tools are therefore applicable.

Ensure a correct mounting of the TRAC F plug: suitable fixation-points and coding-points are to be placed correctly at the front-side of the electronic devices. For flat front-panels, a particular TRAC F fixation frame is available on request.

Assembled connectors correspond to the follwing requirements:
- EN 60529 Protection class IP44/ for indoor application only
- IEC 61373, VDE 0115-106 shock and vibrationtest

TRAC F plugs may be supplied as single components or connectors sets.
To order connector-sets, the following information is necessary:

- number of required cable admittances
- outer diameters of cables and type of cable with/without EMC-shielding for each admittance
- number of contacts (48/31/15)

and, if required:
- type and number of contacts (single contacts or strip-contacts)
- supply of coding parts
- supply of fixation frames

### *4.1.1 Technical Information*

**Electrical Properties**

All electric data are valid on sea level with an environment temperature of 20 °C. Deviating environment conditions are to be taken into account with the plug interpretation.

| | | TRAC F-48 | TRAC F-31 | | TRAC F-15 |
|---|---|---|---|---|---|
| Contact insert | | FKE F48 | FKE F31 | | FKE H15 |
| Type of contacts | | Signal | Signal | Power | Power |
| Test voltage | [V] AC 1 Min | 1500 | 1500 | 1500 | 1500 |
| Service voltage | [V] AC/DC | 125 | 125 | 125 | 125 |
| Operating current at 20° C * | [A] | 5.5 | 5.5 | 12 | 12 |
| Contact resistence | [mΩ] | ≤ 8 | ≤ 8 | | ≤ 8 |
| Creepage distances in contacting zone | [mm] | ≥ 3 | ≥ 3 | | ≥ 3 |
| Creep resistance acc. to IEC60664 | CTI-value | > 300 | > 300 | | > 300 |
| Insulation resistance | [MΩ] | > 5000 | > 5000 | | > 5000 |

*) Valid for single contact, consider the rating curves according to EN IEC 60603-2 for connectors

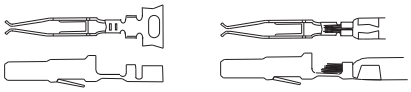
### Thermal properties / Fire characteristic

| | | TRAC F |
|---|---|---|
| Insert Material | | reinforced Polyester |
| Operating temperature | [°C] | -55 to + 125 |
| Fire Resistance Class | acc. UL 94<br>acc. NF F 16-101/102 | V-0<br>F2/I3 |

### Mechanical Properties - Connector

| | TRAC F |
|---|---|
| Case | 2-piece, screwed together |
| Case material | zinc cast (self passivating) |
| Screws | stainless steel V2A |
| EMC Shielding | with shielding sleeves: 360° for each cable |
| Coding | 7 possibilities |
| Pressed cable clamp | Strain relief up to 150 N |
| Cable clamps with cable tie | specially suitable for Single wire Bundles |

### Mechanical Properties - Contacts



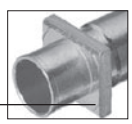
| | | TRAC F |
|---|---|---|
| Number of contacts | | 48 (Signal contacts)<br>31 (7 Power + 24 Signal contacts)<br>15 (15 Power contacts) |
| Mechanical contact-lifespan | Mating Cycles | min. 500 (specification class 1) |
| Separation Force per contact | [N] | ~ 15 |
| Conductor cross-sections signal contacts | | 0.14 up to 1.50 mm² |
| Conductor-cross-sections power contacts | | 0.8 up to 6mm²<br>using FASTON-sleeves of size 6.3 x 0.8mm |

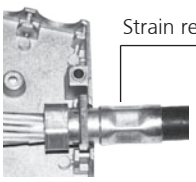
Signal contacts are available as single contacts or for automated processings, as contact-strips.

### Cable strain relief

The cable clamp shall be tightly pressed into the guiding grooves of the connector cover

Elevated spikes at the corners ensure a proper contact with the connector cover

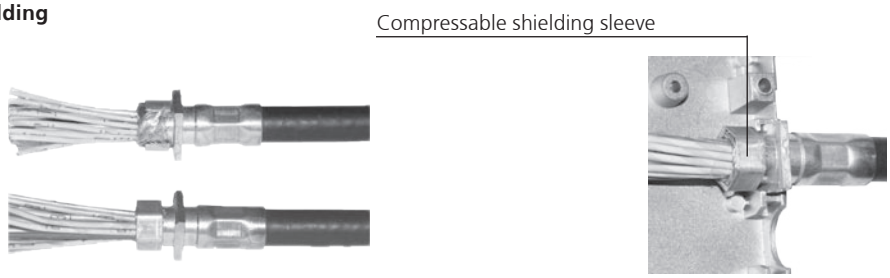





The cable is fxed to the cable clamp by a strain relief compression. Cable clamps are available in diameter from 6 up to 14mm. This allows to connect cables of any diameters, 4 up to 14mm. If necessary, we recommend the use of heat shrinking tube to adjust the cable diameter to the cable clamp. In this case a verification of the strain relief with a test force of at least 150 N during 1 Minute shall be considered.

Our pressing tools ensure an invariant pressing process result if properly operated to achieve clear surface contact of the two die shells.

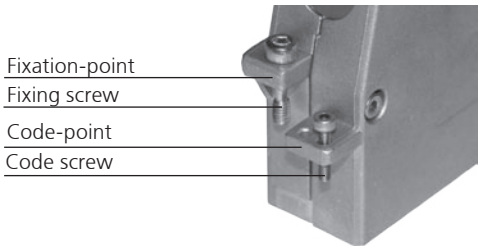
**EMI-Shielding**




To guarantee a 360° EMC protection, the TRAC F connector conclude a separate compressable shielding-sleeve that tightly connects the cable shield to the cable clamp. The cable clamp shoulder is additionaly equipped with small spikes to provide an adequate and secure contact between case and cable clamp.

The shielding sleeves is easily positioned and pressed with the appropriate GIMOTA compression tool.

**Coding**

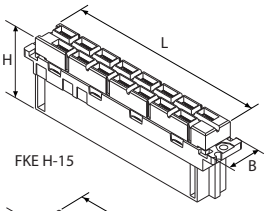



To code the TRAC F-connector code screws at the connector and code pins at the fixation frame are required. The coding of TRAC F connectors is preferably to be set during the final assembling, to avoid false coding set-up's.
Coding is very simple:
1. Screw the code-screws in the code-point at the plug
2. Fill the unused code-holes at the fixation-frame with the corresponding code-pins

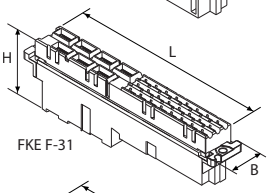
## 4.2 Single parts and contacts for data signal connectors TRAC-F

### *4.2.1 Contact Housings TRAC-F*

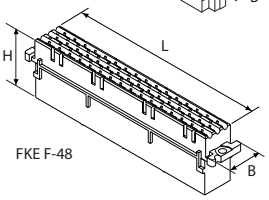
a




b




c

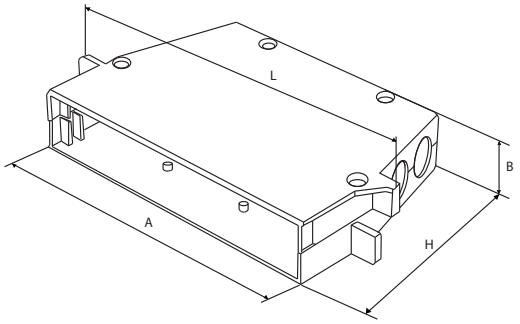



Material: Reinforced polyester

| Item number | Number of Poles | Contacts Signal | Contacts Power | L mm | B mm | H mm | Illustration |
|---|---|---|---|---|---|---|---|
| FKE H-15 | 15-poles | | 15 | 84.7 | 14.8 | 31.0 | a |
| FKE F-31 | 31-poles | 24 | 7 | 84.9 | 14.7 | 31.0 | b |
| FKE F-48 | 48-poles | 48 | | 85.1 | 14.6 | 25.0 | c |

Electrical, Thermal, Mechanical properties: (see 4.1.1)

### 4.2.2 Cover TRAC F




Material: Zinc-cast (self passivating)

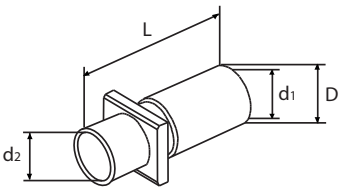
| **Item number** | **A** mm | **B** mm | **H** mm | **L** mm | Cable admitences |
|---|---|---|---|---|---|
| TRACF 00 | 98.55 | 20.0 | 69.4 | 113.5 | 6 |

Consisting of:
2 half shells *TRAC F*, 4 case screws *FI6KTBN610 M2.5x16*, 4 hex. screw nuts *FMU M2.5*,
2 fixing screws *FI6KT M3x12*, 2 washers *SUBN3212*

Mechanical properties: (see 4.1.1)

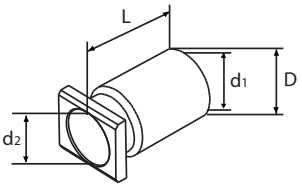
### 4.2.3 Cable clamp / Shielding sleeves / Wire hole plug

**Cable clamps**



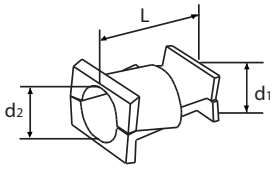

Material: Brass, tin-plated

| **Item number** | **D** mm | **d1** mm | **d2** mm | **L** mm | **External diameter of cable** (mm) | **Strain relief compression** | **Shield compression** |
|---|---|---|---|---|---|---|---|
| SUKABC06S | 7.4 | 6.0 | 6.0 | 20.5 | 5.8 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC067S | 7.4 | 6.7 | 6.0 | 20.5 | 6.5 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC09S | 10..0 | 9.0 | 9.0 | 20.4 | 8.8 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC10S | 11.0 | 10.0 | 9.0 | 30.4 | 9.8 $^{+0}/_{-0.8}$ | yes | yes |
| SUKABC12S | 13.0 | 12.0 | 10.8 | 30.4 | 11.8 $^{+0}/_{-0.8}$ | yes | yes |




Material: Brass tin-plated

| Item number | D mm | d1 mm | d2 mm | L mm | External diameter of cable (mm) | Strain relief compression | Shield compression |
|---|---|---|---|---|---|---|---|
| SUKABC12 | 13.0 | 12.0 | 10.0 | 22.4 | 11.8 $^{+0}/_{-0.8}$ | yes | no |

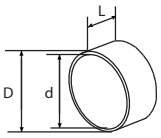



Material: zinc cast

| Item number | d1 mm | d2 mm | L mm | External diameter of cable (mm) | Strain relief | Shield compression |
|---|---|---|---|---|---|---|
| SUKABV69 | 6-9 | 6-9 | 18.0 | 9 $^{+0}/_{-3.0}$ | yes* | no |

* with cable tie SUKABV69K

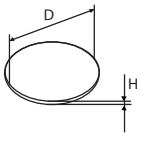
## Shielding sleeves / supporting sleeves




Material: Bronze tin-plated

| Item number | For cable clamp | d mm | D mm | L mm | colour |
|---|---|---|---|---|---|
| SUGSC297 | SUKABC06S<br>SUKABC067S | 7.5 | 8.5 | 6.4 | green |
| SUGSC460 | SUKABC09S<br>SUKABC10S | 11.7 | 13.0 | 6.4 | silver |
| SUGSC500 | SUKABC12S | 12.7 | 14.6 | 6.4 | green |

## Wire hole plugs

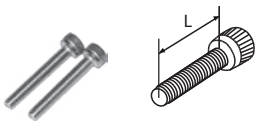



Material: Stainless steel

| Item number. | Description | D mm | H mm |
|---|---|---|---|
| FBL12.8x0.4 | Wire hole plug to close the non used cable admitances | 12.80 | 0.40 |

## 4.2.4 Code screw / Code pin

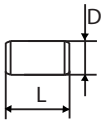
**Code screw**




Material: Stainless steel

| Item number | Thread | L mm |
|---|---|---|
| FSCI6KT M2x10 | M2 | 10.0 |

**Code pin**

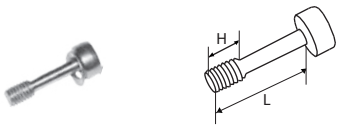



Material: stainless steel

| Item number | D | L |
|---|---|---|
| FSCZS 3x6 | 3.0 | 6.0 |

## 4.2.5 Screws / Washer

**Plug fixing screws (hexagonal socket screws)**



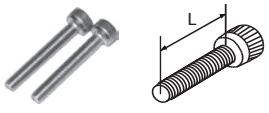

Material: Stainless steel

| Item number | Thread | L mm | H mm |
|---|---|---|---|
| FSCI6KT M3x12 | M3 | 12 | 5 |

**Spring washer to plug fixing screws:**

| | | |
|---|---|---|
| **Item Number:** | SUSN212748 M3 | M3 |
| Dimensions: | inner diameter: | 3.2 |
| | outer diameter: | 5.7 |
| Material: | stainless steel | |

**Case screws**




Material: Stainless steel

| Item number | Thread | H mm |
|---|---|---|
| FSCI6KT M2.5x16 | M2.5 | 16.0 |

## 4.2.6 *Contacts*

### Snap-In Contacts (Signal) Type F

Material: Phosphorus bronze, nickle-plated

| Item number | Description | Cross-Section (mm²) | AWG | Contact surface / surface of contact zone |
|---|---|---|---|---|
| FSCS-26AU1 | Single contact | 0.12 - 0.50 | 26-20 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |
| FSCS-26AU1-50 | Contact strip, roll 5000 pcs | 0.12 - 0.50 | 26-20 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |
| FSCS-20AU1 | Single contact | 0.50 - 1.50 | 20-15 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |
| FSCS-20AU1-50 | Contact strip, roll 5000 pcs | 0.50 - 1.50 | 20-15 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |

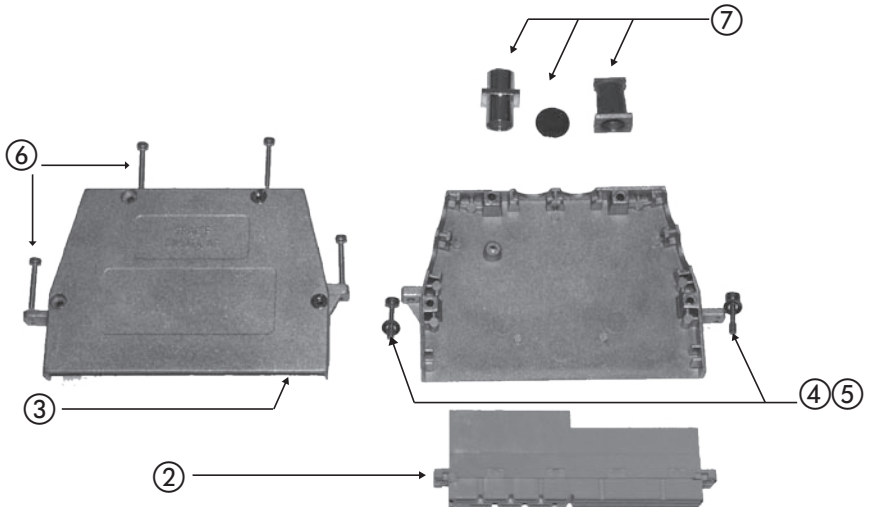
### FASTON Contacts (Power)

Material: Brass

| Item number | Description | Cross-Section (mm²) | AWG | Contact surface / surface of contact zone |
|---|---|---|---|---|
| FSCF-20 | Single contact, 6.3 mm | 0.5 - 1.0 | 20-17 | brass |
| FSCF-17 | Single contact, 6.3 mm | 1.0 - 2.5 | 17-14 | brass |

## 4.3 Connector sets TRAC F

### *4.3.1 Connector parts set TRAC F*




| Pos. | Description | Item number | Quantity | Set code configuration a | b | c |
|---|---|---|---|---|---|---|
| 1 | TRAC F Connector Set | TRAC F | | **TRACF** | **TRACF** | **TRACF** |
| 2 | Housing H 15 | FKE H15 | 1 | **15** | | |
| | Housing F 31 | FKE F31 | 1 | | **31** | |
| | Housing F 48 | FKE F48 | 1 | | | **48** |
| 3 | Cover | TRAC F00 | 1 | * | * | * |
| 4 | Screw M3x12 mm | FSCI6KT M3x12 | 2 | * | * | * |
| 5 | Washer M3 | SUSN212748 M3 | 2 | * | * | * |
| 6 | Screw M2.5x16 mm | FSCI6KT M2.5x16 | 4 | * | * | * |
| 7 | Cable clamps / Wire hole plugs | | X | | 6 (individual) | |
| | Contact Snap-In | | X | - | 24 | 48 |
| | Contact FASTON | | X | 15 | 7 | - |
| | Shielding sleeves | | X | | up to 6 | |

**Ordering example:**
TRAC F connector (**TRACF**), 48-poles F-housing (**48**) = Part No.: **TRACF48**

* These parts are included in the set.
X These parts have to be ordred separately if required.

## 4.4 Tools for data connectors TRAC F

### *4.4.1 Compression tool for cable clamps and shielding sleeves*

**Mechanical hand compression tool**

| Item number | Twin-Die for strain relief and shield compression | for cable clamp | for shielding sleeve |
|---|---|---|---|
| GIW30L | GIM30K06 | SUKABC06S | SUGSC297 |
| GIW30L | GIM30K06 | SUKABC067S | SUGSC297 |
| GIW30L | GIM30K09 | SUKABC09S | SUGSC460 |
| GIW30L | GIM30K10 | SUKABC10S | SUGSC460 |
| GIW30L | GIM30K09 / GIM30K10 / GIM30K12 * | SUKABC12 | - |
| GIW30L | GIM30S12 | - | SUGSC500 |
| GIW30L | GIM30K12 | SUKABC12S | - |

* One of the mentioned dies can be used for cable clamp and shielding sleeves.

### *4.4.2 Crimping tool for contacts*

**Crimping tool for snap-in / FASTON contacts**

| Item number Handle | Item number Presshead | Description | Item No. Contacs |
|---|---|---|---|
| GIW10V | GIM10VFSCS | Mechanical crimping tool for Snap-In contacts Type F | FSCS-26AU1<br>FSCS-20AU1 |
| GIW10V | GIM10VFSCF | Mechanical crimping tool for FASTON contacts | FSCF-20<br>FSCF-17 |

### 4.4.3 *Extraction tool for contacts*

**Extraction tool for Snap-In contacts type F**

| Item number | Text | Contact type |
|---|---|---|
| WMLE FS | Extraction-tool for Snap-In contacts | FSCS-26AU1 / FSCS-20AU1 |

### 4.4.4 *Accessories*

**Hex. socket screw driver**

| Item number | Description | Application |
|---|---|---|
| GIW903 | for hex. socket screws M3 | plug fixing screws |
| GIW904 | for hex. socket screws M2.5 | case screws |
| GIW905 | for hex. socket screws M2 | code screws |

## 4.5 Assembly Instructions TRAC F

### *4.5.1 Preparation*

**Standard part set**

Parts sets are supplied corresponding to the order in set-packages. Note that contacts and shielding sleeves as well as optional filling tubes are not included in the parts sets. They are to be ordred separetly for each case.

The following standard parts sets are available:

| | |
|---|---|
| Case | TRAC F00 |
| Case with contact insert 48p | TRAC F48 |
| Case with contact insert 31p | TRAC F31 |
| Case with contact insert 15p | TRAC F15 |

You will find the part set overview in chapter (4.3.1).

**Individual part set according to customer specification**

Individual part sets according to customers specification can be defined and supplied on request.

**Contacts**

Contacts are to be selected according to the relevant information in this catalogue:
- Contact layout (number of poles) (acc. chapter 4.2.1)
- Conductor cross-section (acc. chapter 4.2.6)
- Manufacturing mode (single contacts or contacts on reels)

**Shielding sleeves**

Shielding sleeves are to be selected depending on the cable clamps: (acc. 4.2.3)

| Item number | required shielding sleeve | colour |
|---|---|---|
| SUKABC06S | SUGSC297 | green |
| SUKABC067S | SUGSC297 | green |
| SUKABC09S | SUGSC460 | silver |
| SUKABC10S | SUGSC460 | silver |
| SUKABC12S | SUGSC500 | turquoise |

**Tools**

Compression Tools for cable clamps (see 4.4.1)
Compression Tools for shielding sleeves (see 4.4.1)
Crimping Tools for contacts (see 4.4.2)
Supporting Tools (see 4.2.3 - 4.4.4)

Moreover the following standard tools are recommended:
- Crosshead-screwdriver
- Cable stripper
- Knife
- Plastic hammer

**Accomplishing Material** (optinal)

- Cable tie SUKBV69K to cable clamp SUKABV69 (see 4.5.2)
- Heat shrinkable tubes to single conductor bundles (see 4.5.2)
- Heat shrinkable tubes for diameter adaption (see 4.5.2)
- Heat shrinkable tubes for conductor identification
- Label for connector identification

## 4.5.2 Cabel set

**Conductor, dismanteling**

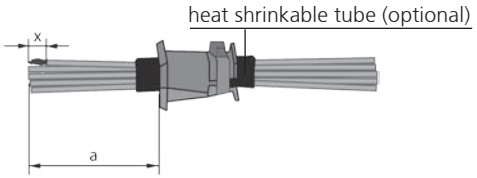
| | | | | | |
|---|---|---|---|---|---|
| Disinsulation length | x | mm | 2.5 | 2.5 | 2.5 |
| Conductor area | A | mm² | 0.12 - 0.50 | 0.5 - 1.5 | 0.5 - 2.5 |
| For contact type | | | Snap-In | Snap-In | FASTON |

**Single Conductors, non shielded:**

Single conductor bundles may be fixed with the divisible cable clamp for various diameters from 6 up to 9 mm.

- Dismantle Conductors by (x)mm acc. conductor dismanteling table
- A heat shrinkable tube can be applied at the clamping area (optinal)
- Firmly tight the cable clamp with the cable tie SUKBV69K

| | | Cable entrances at side | Cable entrances at front |
|---|---|---|---|
| Approximate distance from cable clamp to end of conductors | a | 93 mm | 73 mm |

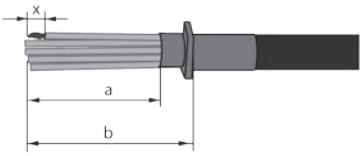



**Multiple Conductor Cable, non shielded:**

For adequate strain relieve of non shielded cables the cable clamps SUKABC can be used for 6mm to 12mm cable diameters.

- Dismantle Conductors by (x)mm acc. conductor dismanteling table
- A heat shrinkable tube can be applied at the clamping area to enlarge cable diameters (optinal)

| | | Cable entrances at side | | Cable entrances at front | |
|---|---|---|---|---|---|
| Cable outer diameter | | < = 9 | > 9 | < = 9 | > 9 |
| Approximate distance from cable clamp to end of conductors. | a | 87 mm | 97 mm | 67 mm | 77 mm |
| Approximate distance from cable insulation to contacts. | b | 93 mm | 103mm | 73 mm | 83 mm |

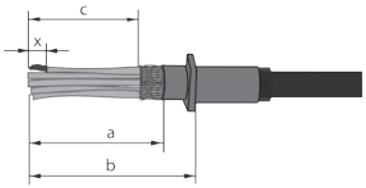


**Multiple Conductorcable, shielded:**

For adequate strain relieve and and excellent shielding performance the cable clamps SUKABC can be used for 6mm to 12mm cable diameters.

- Dismantle Conductors by (x)mm acc. conductor dismanteling table
- A heat shrinkable tube can be applied at the clamping area to enlarge cable diameters (optinal)

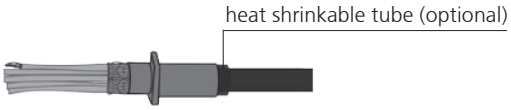
| | | Cable Entrances at side | | Cable Entrances frontside | |
|---|---|---|---|---|---|
| Cable outer diameter | | ≤ 9 | > 9 | ≤ 9 | > 9 |
| Approximate distance from cable clamp to end of conductors. | a | 87 mm | 97 mm | 67 mm | 77 mm |
| Approximate distance from cable insulation to contacts. | b | 93 mm | 103mm | 73 mm | 83 mm |
| Approximate distance from shield to contacts | c | 80 mm | 90 mm | 60 mm | 70 mm |




**Application of Cable Clamp SUKABCxxS for cable retention**

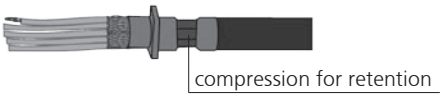
If the overall diameter of the cable is more than 1 mm smaller than the cable clamp inside diameter, the application of a heatshrinkable or filler tube with a length of approximately 25 mm is required. (Img. 1)

(Img. 1)




Crimp the retention reach at the cable clamp with the specified tool (acc. to 4.4.1). (Img. 2)

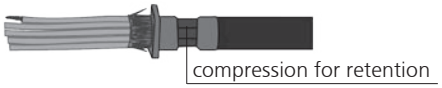
(Img. 2)




**Application of shielding sleeve to Cable Clamp SUKABCxxS**

- After compression of the cable clamp for cable retention, the shield has to overlap not more than 8 mm from the shield contaction reach
- Fold back the shield over the shield contactation reach (Img.1)
- Set up the shielding sleeve in flush with the end of the cable clamp (Img. 2/3)
- Compress the shielding sleeve with the specified tool (acc. to 4.4.1) (Img. 4)

(Img. 1)



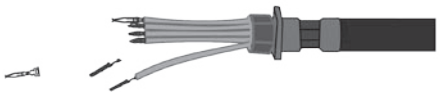

(Img. 2)

(Img. 3)

(Img. 4)

**Contact crimping**

| | |
|---|---|
| Contact: | To be crimped with the specified tool acc. to 4.4.2 |
| IMPORTANT: | The crimping tool has to be closed completely, that means until the automatic release of the tool. |



**Check**

| | |
|---|---|
| Crimping: | Examine the position and the shape of the crimping |
| Single wires: | No wires must be beyond the crimping slot |
| Contact shape: | Contacts must not be deformed or damaged beyond the crimping reach |

**Heat Shrinkable Tubes fixing**

| | |
|---|---|
| Optional: | At the connection area of each conductor heat shrinkable tubes for identification and/ or for support or additionall insulation of conductors may be applied. |

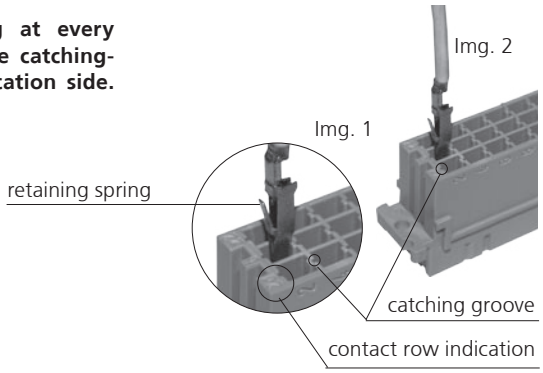
## *4.5.3 Assembling*

**Contacts application**

Apply the contacts, corresponding to the contact layout requirement, into the contact housing until they properly click in. Examine the correct contact fixing by slightly pulling each conductor.

**IMPORTANT:**
**It is required that the retaining-spring at every Snap-In contact is positioned towards the catching-groove, or towards the contact row indication side.**
(refer to Img. 1 and Img. 2)

In case of wrong insertion, no fixation in the contact chamber can be achieved and the retaining-spring will be damaged. The contact finally **must** be replaced before re-insertion of the contact!




**Connector Assembling**

| | |
|---|---|
| Case: | examine regarding residues (eg wire rests), clean it accordingly |
| Contact housing: | apply to the correct position |
| Cable clamp: | push up against the case (if required use plastic hammer) |
| Wire hole plug: | push up against the case (if required use plastic hammer) |
| Conductors: | check arrangement, put it in adequate order if necessary |
| Cover 2 shells: | place the upper half at the lower half (Plastic hammer)<br>apply cover screws and tighten them<br>apply fixing screws including the spring washers |
| Optional: | apply selfadhesive lable for connector identification |
| Optional: | apply the coding screws at the connector case |

# 5 Connector Kit F9/3BHC

## 5.1 Introduction

The electronics connector with the designation **3BHC** are a complement to the broad range of type F products. The 9-pin male multipoint connector are available with angled dip soldring contacts, the female multipoint connector with crimp contacts. Therefor the appropriate crimp contacts Type FSCS can be used. The connectors comply with protection class IP44 acc. to IEC EN 60529, they are only qualified for indoor application.

The application areas include:
- Industrial Electronics
- Power Electronics
- Railway Engineering

Advantages:
- Elimination of an additional contact with the male multipoint connector compared to the FASTON connection
- Simple crimping of the female multipoint connector on manual or automated facilities
- Space saving compared to the standard type F connectors
- The male multipoint connectors are easy to engage with the female multipoint connectors

### *5.1.1 Technical Information*

**Electrical Properties**

All electric data are valid on sea level with an environment temperature of 20 °C.Deviating environment conditions are to be taken into account with the connector interpretation.

| | | 3BHC | 3BHC |
|---|---|---|---|
| Contact insert | | male multipoint connector | female multipoint connector |
| Type of Contacts | | Signal | Signal |
| Number plug contacts | | 9 | 9 |
| Test Voltage | [V] AC 1 Min | 1500 | 1500 |
| Operating Voltage | [V] AC/DC | 125 | 125 |
| Operating Current at 20° C * | [A] | 5.5 | 5.5 |
| Contact-Resistence | [mΩ] | ≤ 8 | ≤ 8 |
| Creeping Distances | [mm] | ≥ 3 | ≥ 3 |
| Creepage-Resistance acc. to IEC664 | CTI-value | > 300 | > 300 |
| Insulation-Resistance | [MΩ] | > 5000 | > 5000 |

*) Valid for single Contact, consider the Rating according to IEC 60603-2 (DIN 41612) for connectors.

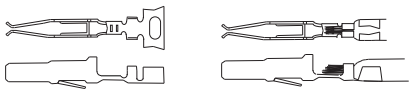
**Thermal Properties**

| | | 3BHC |
|---|---|---|
| Contact housing Material | | reinforced polyester |
| Fire Resistance Class | acc. UL 94<br>acc. NF F 16-101/102 | V-0<br>F2/I3 |
| Operating Temperature | [°C] | -55 bis +125 |

**Mechanical Properties Connector**

| | 3BHC |
|---|---|
| Cover | 2-piece, screwed together |
| Cover material | polyamide 6/66 |
| Screws | stainless steel V2A |
| EMC shielding | no |
| Coding | not applicable |
| Cable clamp screwed | Strain relief up to 50 N |

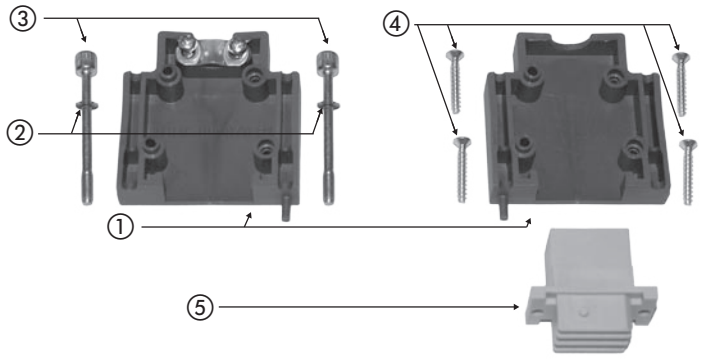
**Mechanical Properties Contacts**



| | | 3BHC |
|---|---|---|
| Mechanical Contact-lifespan | Mating Cycles | min. 500 (specification class 1) |
| Mating Force per contact | [N] | ~ 1.5 |
| Conductor Cross-sections | | 0.14 up to 1.50 mm² |

## 5.2 Connector set F9/3BHC

### *5.2.1 Connector parts set F9/3BHC 860 070 R100*



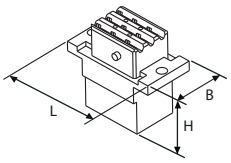

| Pos. | Description | Item number | Qty. |
|---|---|---|---|
| 1 | Cover (bottom part) | 3BHC 860 070 R0001 | 1 |
| 1 | Cover (top part) | 3BHC 860 070 R0002 | 1 |
| 2 | Washer M3 | SUSN212748 | 2 |
| 3 | Screw M3 x 34 | SUI6KT M3x34 | 2 |
| 4 | Cover screw | 3BHC 860 070 R0006 | 4 |
| 5 | Female multipoint connector F9 | 3BHC 860 070 R0003 | 1 |

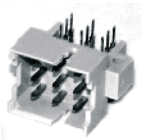
Order Number: **3BHC 860 070 R100**

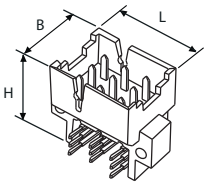
Contacts and male multipoint connectrors have to be ordred seperate if required.

### 5.2.2 *Multipoint Connectors F9/3BHC*


a





b




| Item number | Pin | L mm | B mm | H mm | Pict |
|---|---|---|---|---|---|
| Female multipoint connector F9 / 3BHC 860 070 R0003 | 9-pin | 28 | 14.8 | 24.8 | a |
| 90° Male multipoint connector F9 / 3BHC 860 049 R1303 | 9-pin | 25.3 | 14.8 | 22.1 | b |

### 5.2.3 *Contacts*

**Snap-In Contacts (Signal) Type F for female multipoint connector**

Material: Phosphorus bronze, nickle-plated

| Item number | Description | Cross-Section (mm²) | AWG | Contact surface / surface of contact zone |
|---|---|---|---|---|
| FSCS-26AU1 | Single contact | 0.12 - 0.50 | 26-20 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |
| FSCS-26AU1-50 | Contact strip, roll 5000 pcs | 0.12 - 0.50 | 26-20 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |
| FSCS-20AU1 | Single contact | 0.50 - 1.50 | 20-15 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |
| FSCS-20AU1-50 | Contact strip, roll 5000 pcs | 0.50 - 1.50 | 20-15 | gold-flashed / ≥ 1.25 µm Au on 1.25 µm Ni |

Tools acc. to 4.4.2 / 4.4.3

# 6.0 General Conditions

## 6.1 General Sales Conditions

The General Sales Conditions contained herein are binding for all sales deals between customers and GIMOTA AG.

Deviating or additional provisions and conditions, in particular general purchasing conditions of the buyer, are valid only when these have been expressly agreed by us upon in writing.

**Offers**
Our offers are binding for a period of 3 months unless another term of validity is given in the respective offer.
Our price lists and offers shall be binding only within the validity periods that may be specified. We reserve the right to adjust prices in response to a changed market situation or exchange rate fluctuations in case of long term supply contracts.

**Prices, packaging and conditions of payment**
Our prices are in Swiss francs or explicitly agreed currencies for delivery ex works (EXW). Packaging and the Swiss value-added tax (VAT) are not included in the price.
Conditions of payment: 30 days net.

**Transfer of gain and risk, shipment and insurance**
Gain and risk pass to the purchaser in every case with dispatch of the consignment ex works.
Shipment takes place with invoice and at the consignee's risk.
Transport insurance is taken out by us only at the written request of the consignee. The cost of the insurance is borne by the consignee.

**Delivery periods**
Delivery time given in our offers is considered as a guideline only and begins with the receipt of the order. The delivery deadline is deemed to have been adhered to when, on its expiry, the consignment is in the factory prepared and ready for shipment. We make every effort to adhere to delivery dates given in the order confirmations. However, they are non-binding, and overruns cannot be taken as cause for claims for damages or for cancellations.

**Documents**
Our catalogues, drawings, sketches, etc. are our intellectual property, and may not be copied or given to third parties without our written authority.

**Testing and Acceptance of the Consignment**
Inasmuch it is standard practice and appropriate, GIMOTA AG undertakes to carry out tests on the consignments. If more extensive tests are requested by the purchaser, these must be agreed on in writing and the costs must be borne by the purchaser (e.g. acceptance tests, factory certificates, etc.).

The purchaser has to inspect/test the consignment on receipt and report in writing within 10 days any defects that are found. Failure to do so will be considered as approval of the consignment.

Parts which are found to be unusable due to flaws in the material or because of defects caused during production will be either replaced or repaired, as we consider necessary. Additional provisions will be assesses according the requirements defined by the Quality Management System ISO 9001:2000 and implemented accordingly.

**Property Rights**
The delivered goods remain our property until the full purchase value has been paid. The purchaser gives assurance that he will participate in such measures as are required to protect our property.

**Cancellation**
The cancellation of contracts requires our express and written agreement. Complaints regarding a consignment do not entitle the purchaser to cancel the remainder of an order. We are authorized to withdraw from delivery obligations should the financial situation of the purchaser markedly deteriorate or show itself as being other than that presented to us.

**Warranty**
GIMOTA AG is obligated to replace or repair, as we consider necessary, all parts that are defective or unusable as a result of material flaws or of errors during design or manufacture as soon as possible and at the written request of the purchaser for the duration of the warranty period.
The warranty period is 12 months after receipt of the consignment. Excluded from the warranty is damage due to incorrect storage, natural wear, faulty processing and disregard of regulations, etc.

**Exclusion of Other Liabilities**
Possible claims by the purchaser are covered in full in the „General Sales Conditions". All claims not expressly mentioned for damages, reduction, cancellation of or withdrawal from the contract are excluded.

**Jurisdiction**
The place of jurisdiction is Zurich, Switzerland. The legal relationship is answerable to substantive Swiss law. In the event of the purchaser not having his domicile in Switzerland, the United Nations agreement on contracts concerning the international purchasing of merchandise (Wiener Kaufrecht) of 11.4. 1980 shall apply.

## 6.2 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.

*Data signal connectors:*
The insulators are generally made of a fiber glass-reinforced plastic in a metal frame; covers can be made of die cast metal (zinc, aluminum) or of plastic.

**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 catalogues and 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.

Editorial: Roger Schoch /Andreas Girola / Stephan Spühler
Technical Support: Christian Florin / Roger Schoch / Andreas Girola
Production: Stephan Spühler / Gimota AG
Print: Effingerhof AG

GIMOTA AG
Chrummachestr. 3
CH-8954 Geroldswil
Switzerland

T: +41 44 749 3010
F: +41 44 749 3015

M: info@gimota.ch
W: www.gimota.com