



## EMI/RFI shielding interconnection systems



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# **EMI/RFI shielding interconnection systems**





## Leading in EMI/RFI shielding interconnection systems for more than 35 years

Inotec electronics GmbH being a worldwide operating independent middle-sized company gives priority to long-term value, stability and sustainability over growth and increase in turnover. From the very beginning Inotec focused on applications with highest standards in terms of disturbance-free signal and data transmission. By striving systematically to develop innovative products of high quality and advanced technology our company has established itself as the technological leader in the market for EMI/RFI shielding interconnection systems. Our high level of flexibility, our focus to individual customer care as well as our openness to deliver customer-specific solutions enable us to set standards in the field of connector technology for more than 35 years now.

### What we stand for

- Value orientation and social responsibility towards our customers, suppliers, staff and company environment.
- Made in Germany is our premise – this also applies for bought-in parts.
- Regionally rooted and networked: All our products are developed and manufactured at our location in Lauffen am Neckar.
- Global presence: We advise and supply customers on all continents – either directly or through competent distribution partners.

**1979**                    **1981**                    **1985**                    **1993**

We commenced with the manufacturing and distribution of connectors and individual developments according to customer requirements.

We developed the first EMI/RFI shielding full metal hood for D-Sub connectors combined with a 360° contacting of the cable screen: The Inotec "Crimp Flange System".

The company name changed into Inotec electronics GmbH. Resulting from the continuous expansion of our product lines, we are meanwhile offering the largest range of EMI / RFI shielding full metal hoods for D-Sub connectors.

Expanding our production space we relocated our company from Heilbronn to the new facilities in Lauffen am Neckar.



We are at our best everywhere the highest degree of safety and reliability in data and signal transmission is needed: transportation, aviation and aerospace, communication systems, measurement and control technology, energy management...

## Inotec connector systems – “safe, robust and reliable”

Inotec electronics develops and manufactures high-end connector systems for discerning industrial clients who give priority to safety and reliability. No matter if e.g. an interference-free signal transmission for door or brake control in trains is needed, reliable communications and monitoring systems are to be set up or highly sensitive measuring data to be securely transferred: Inotec always offers an optimal interface solution between cable and end device.

### Safe

With its unique and patented crimp flange technology and a consistent full metal hood system Inotec provides a maximum shielding against disturbances through electromagnetic fields or radio frequency interferences.

### Robust

The complete system, including connectors, hood, fixation and cable connection guarantees an outstanding mechanical toughness due to high-end materials, tight tolerances and a solid design.

### Reliable

By identifying the optimal processing parameters for every cable type we guarantee a maximum static and dynamic load capacity. High-precision gold-plated class 1 quality contacts assure permanently low transition resistances even after numerous reconnect cycles.



1997

1999

2003

2006

2008

2011

2014

We developed and presented the first D-Sub connectors with integrated BUS system.

Inotec introduced the series MSE/F for DIN 41612 connectors on 19" PCB racks. Since then the patented crimp flange system is also available for this key application in railway technology.

Inotec celebrates the inauguration of the new building at our site in Lauffen expanding the R & D department and the EMC laboratory.

The D-Sub range has been broadened by further profibus connectors and impedance-controlled special connectors.

Our patented coding system for D-Sub connectors sets standards for a robust and reliable coding without requiring additional installation space.

Inotec presents the first generation of M12 circular connectors fully compatible with the Inotec crimp flange system.

Inotec introduces a standardized test procedure for traction and torque resistance of cable-specific crimp flange assemblies.

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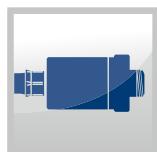
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# D-Sub interconnection systems





## D-Sub full metal hoods for slide locks and automatic slide locks

Slide locks and automatic slide locks are used especially for D-Sub interconnections with frequent reconnect cycles or for difficult mounting locations where a screw-on locking would be problematic being either difficult to reach or very time-consuming to operate.

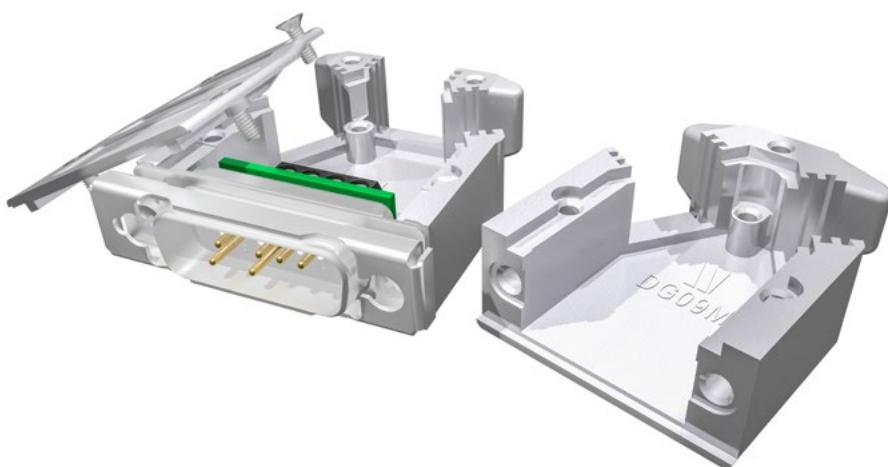
These items are typically applied in test benches and experimental set-ups, in modular control systems or for mobile testing and diagnostic devices. As most

of these kind of applications do require a high level of electromagnetic compatibility (EMC), a reliable EMI / RFI protection by continuous shielding of the interconnection system is indispensable.

Being a specialist for EMI / RFI shielding interconnection systems Inotec electronics has developed the series M1, M2, M3 and M5 which are especially designed for being operated with slide locks and automatic slide locks.

**Inotec focuses on the essential requirements of a high quality, quick acting locking system with high EMC performance:**

- EMC-oriented hood design
- HF-protected full metal hoods made of die-cast zinc with labyrinth cover
- Unused cable outlets are closed with blind plugs for maximum HF-protection
- Integrated grounding point
- Ergonomic hood design (avoids pulling on the cable)
- Minimum transition resistances to shielded cables are achieved in combination with the unique Inotec crimp flange technology in dovetail design
- High-end and durable components for a reliable long-term use
- Quick and safe locking and unlocking
- Reliable protection against unintentional release under tension or vibration and high mechanical load
- Undisturbed and constant ground connection to a mating connector





## M1 / M2 series with slide lock

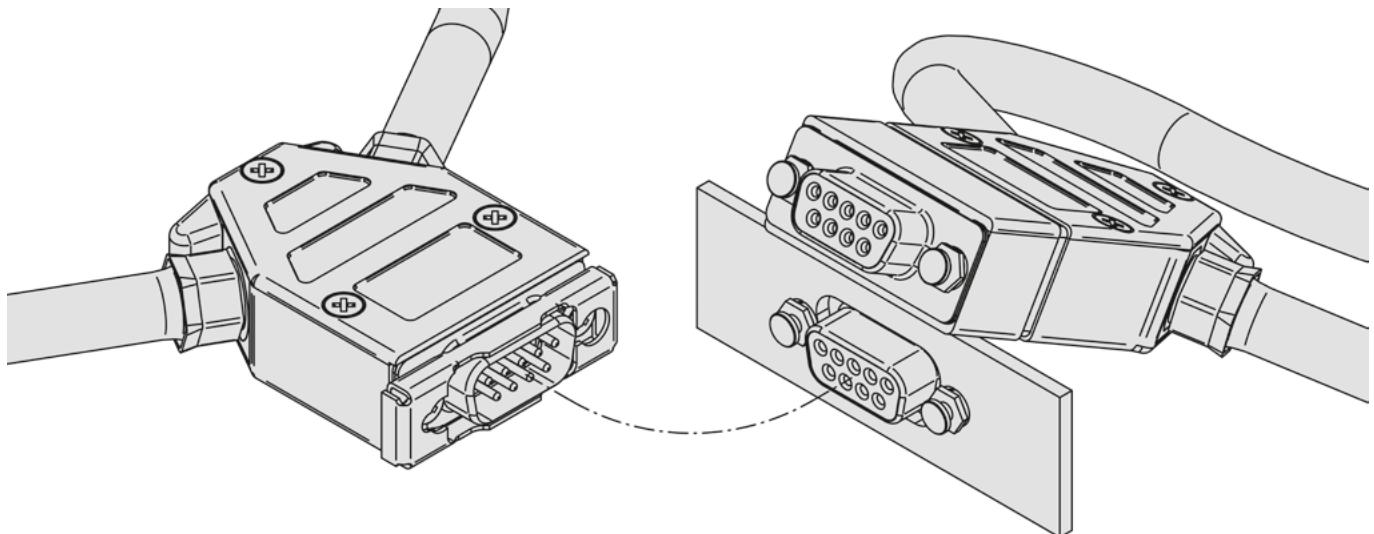
During the development of the M1 and M2 series Inotec put emphasis on a simple and reliable handling as well as on high retention forces.

Despite its space-saving compact design the series offers already 2 cable entries for the 9-way hood, still leaving enough space e.g. for looping through cables. The optionally available M1 hoods with female threading may be used as coupling plug with slide lock or screw-on locking. Being used as screw-type coupling the M1 series hoods are compatible with the Inotec coding system.

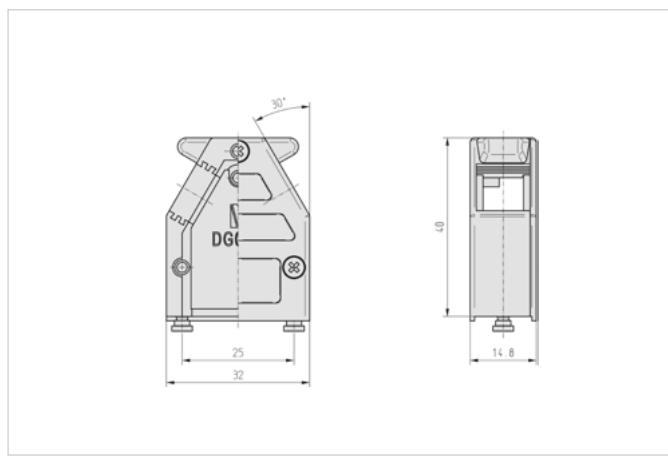
Compared with the M1 series, the M2 series has been extended by 15 mm to permit e.g. the installation of filters or PCB assemblies or offering additional space e.g. for installing mixed-, coaxial- or ribbon cable connectors.

### Special features:

- Standard design with thread-forming locking screws for a safe fixation of the slide
- Type M2 with enlarged interior for circuit boards or mixed cabling
- M1 series without locking may be used as coupling plug



## DG09M1



see page 12: DG09M1-3 and DG09M1/4-40

### Specifications

- For 9-way D-Sub and HD15 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for a collision-free use on 3HP standard racks
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 3 pcs. cover screws M2,5x7\*
- 2 pcs. shoulder screws\*

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Accessories

- slide lock

**Art.-No.**  
DV09G1

All dimensions on part drawings are indicated in mm.

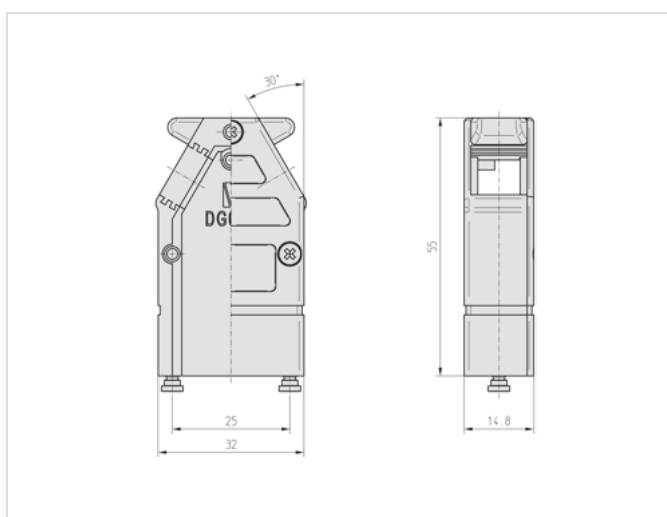
\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





# M1/M2 series

## DG09M2



### Specifications

- For 9-way D-Sub and HD15 connectors
- Extended version, 55 mm height (without crimp flange or cable clamp) with additional interior space, e.g. for integrated PCB or special wiring
- 14,8 mm width for a collision-free use on 3HP standard racks
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Scope of supply

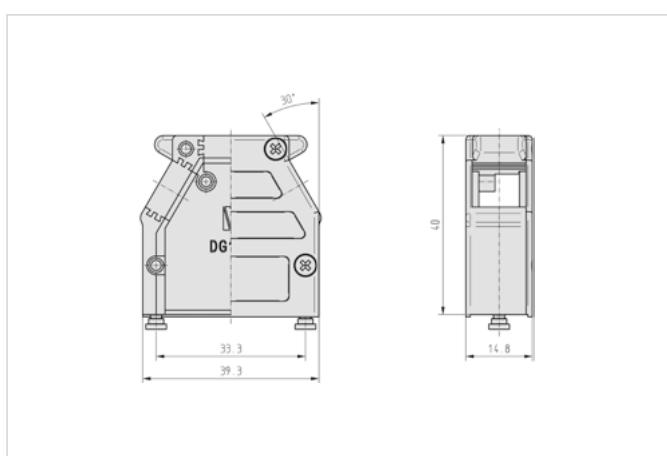
- 1 pc. full metal hood with cover
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5 \*
- 3 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

Art.-No.  
DV09G1

### Accessories

- slide lock

## DG15M1



### Specifications

- For 15-way D-Sub and HD26 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for a collision-free use on 3HP standard racks
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

Art.-No.  
DV15G1

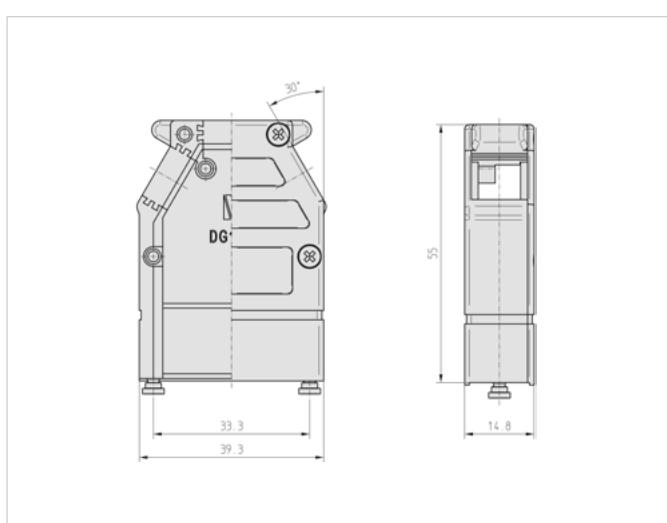
### Accessories

- slide lock



see page 12: DG15M1-3 and DG15M1/4-40

## DG15M2



### Specifications

- For 15-way D-Sub and HD26 connectors
- Extended version, 55 mm height (without crimp flange or cable clamp) with additional interior space, e.g. for integrated PCB or special wiring
- 14,8 mm width for a collision-free use on 3HP standard racks
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

Art.-No.  
DV15G1

### Accessories

- slide lock

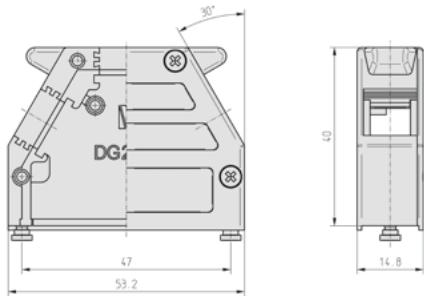
All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



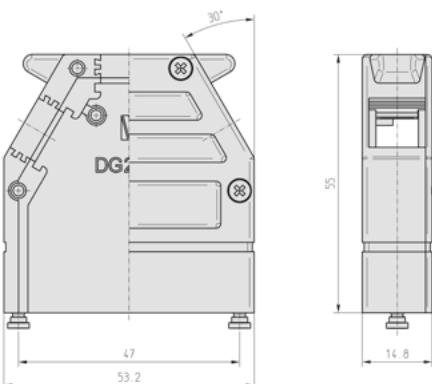


## DG25M1

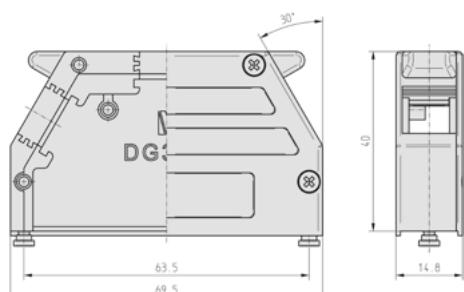


see page 12: DG25M1-3 and DG25M1/4-40

## DG25M2



## DG37M1



see page 12: DG37M1-3 and DG37M1/4-40

### Specifications

- For 25-way D-Sub or HD44 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for a collision-free use on 3HP standard racks
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Accessories

- slide lock

### Art.-No.

DV25G1

### Specifications

- For 25-way D-Sub or HD44 connectors
- Extended version, 55 mm height (without crimp flange or cable clamp) with additional interior space, e.g. for integrated PCB or special wiring
- 14,8 mm width for a collision-free use on 3HP standard racks
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Accessories

- slide lock

### Art.-No.

DV25G1

### Specifications

- For 37-way D-Sub and HD62 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for a collision-free use on 3HP standard racks
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Accessories

- slide lock

### Art.-No.

DV37G1

All dimensions on part drawings are indicated in mm.

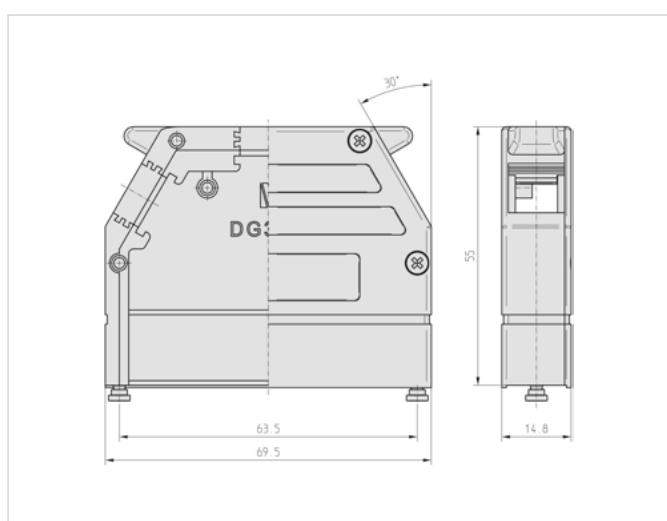
\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



## M1/M2 series



## DG37M2



## Specifications

- For 37-way D-Sub and HD62 connectors
- Extended version, 55 mm height (without crimp flange or cable clamp) with additional interior space, e.g. for integrated PCB or special wiring
- 14,8 mm width for a collision-free use on 3HP standard racks
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

## Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

## Spare part Art.-No.

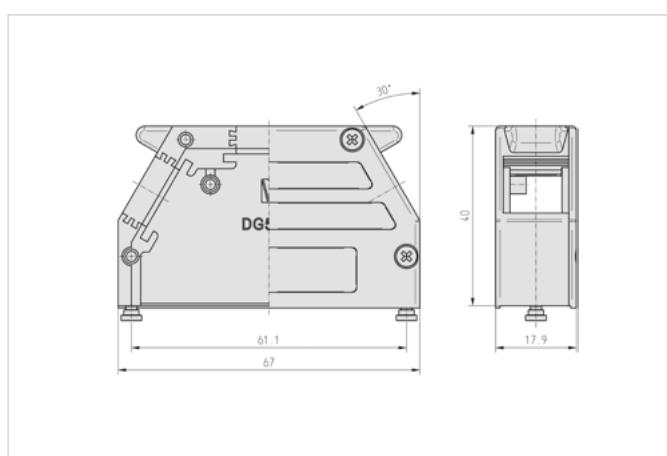
DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

## Accessories

- slide lock

Art.-No.  
DV37G1

## DG50M1



## Specifications

- For 50-way D-Sub and HD78 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 17,9 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS200

## Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

## Spare part Art.-No.

DBS200  
DZ-ES1  
DZ-SS1  
DZ-AS1

## Accessories

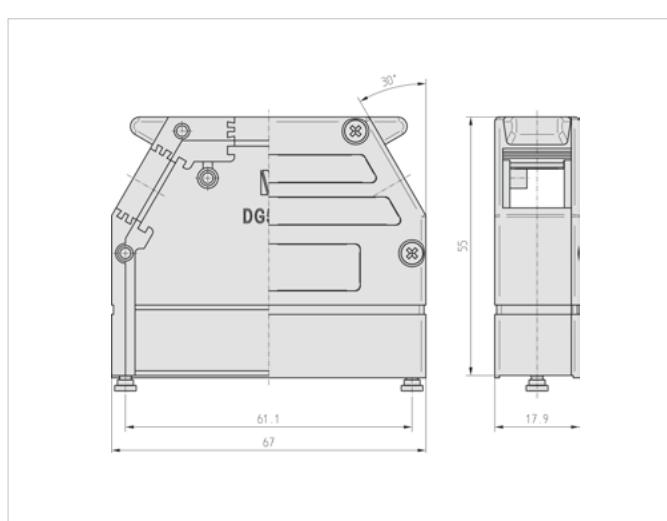
- slide lock

Art.-No.  
DV50G1



see page 12: DG50M1-3 and DG50M1/4-40

## DG50M2



## Specifications

- For 50-way D-Sub and HD78 connectors
- Extended version, 55 mm height (without crimp flange or cable clamp) with additional interior space, e.g. for integrated PCB or special wiring
- 17,9 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS200

## Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

## Spare part Art.-No.

DBS200  
DZ-ES1  
DZ-SS1  
DZ-AS1

## Accessories

- slide lock

Art.-No.  
DV50G1

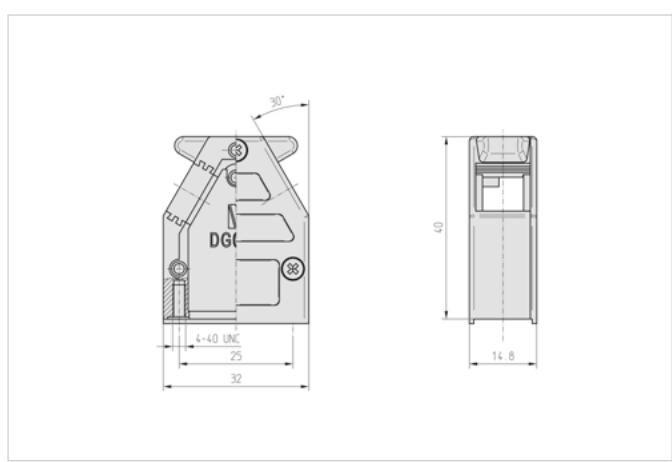
All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



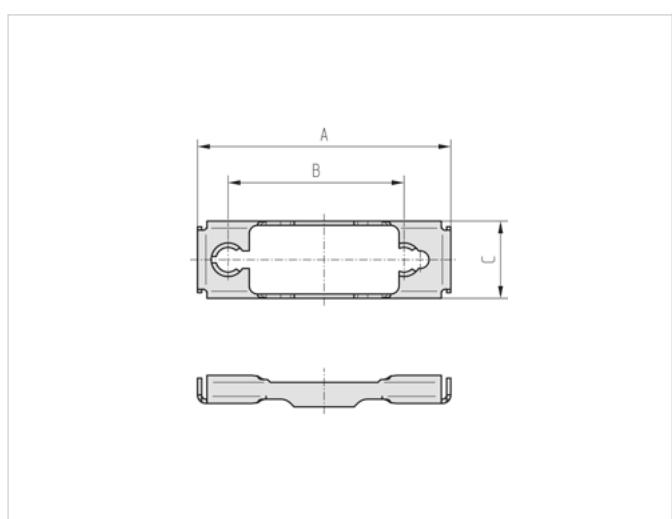


## DGxxM1/4-40

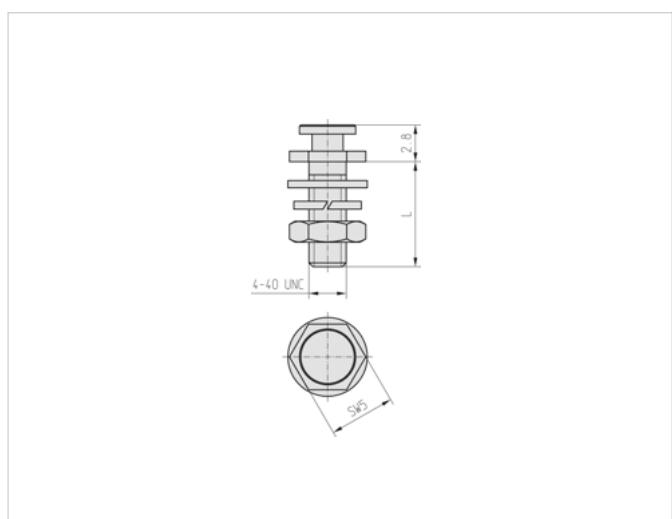


Combine with Inotec „KOD03“ connectors and „KOB“ jackscrews to build coded counterconnectors

## Slide lock DVxxGx



## Locking bolt DV-B1/x



### Specifications

- Version with pre-cut female thread
- Suitable as counterconnector for slide-lock- or screwed connections
- Full metal hood with 4-40 UNC female thread (M3 available on request)

### Hood size

	Art.-No.
■ 9-way (see adjoining picture)	DG09M1/4-40
■ 15-way	DG15M1/4-40
■ 25-way	DG25M1/4-40
■ 37-way	DG37M1/4-40
■ 50-way	DG50M1/4-40

### Scope of supply

- 1 pc. full metal hood with cover
- 3 pcs. (≥15-way 4 pcs.) cover screws M2,5x7 \*

Spare part Art.-No.

DZ-SS1

### Accessories

■ Locking bolt for M1 / M2 series	DV-B1/1
■ Hexagon bolt 4-40 UNC, female thread 4-40 UNC	DV-B2/2
■ Hexagon bolt 4-40 UNC, female thread M3	DV-B2/2M3

### Specifications

- Sliding part in stainless steel

Hood size	A	B	C	Art.-No.
■ 9-way	36,0	25,0	11,0	DV09G1
■ 15-way	44,3	33,3	11,0	DV15G1
■ 25-way	58,0	47,0	11,0	DV25G1
■ 37-way	74,5	63,5	11,0	DV37G1
■ 50-way	72,1	61,1	13,6	DV50G1

### Scope of supply

- 1 pc. slide

Option	A	B	C	Art.-No.
■ 9-way	36,0	25,0	11,0	DV09G2
■ 15-way	44,3	33,3	11,0	DV15G2
■ 25-way	58,0	47,0	11,0	DV25G2
■ 37-way	74,5	63,5	11,0	DV37G2
■ 50-way	72,1	61,1	13,6	DV50G2

### Scope of supply

- 1 pc. sliding part
- 2 pcs. shoulder screws\* 4-40 UNC incl. nut and spring washer

### Specifications

- Locking bolt matching with slide DVxxG1

### Length L

■ 8,0	DV-B1/1
■ 12,9	DV-B1/2

### Scope of supply

- 2 pcs. screws 4-40 UNC, hexagon head SW 5
- 2 pcs. nuts 4-40 UNC
- 2 pcs. spring washers
- 2 pcs. washers



All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



# M3 series

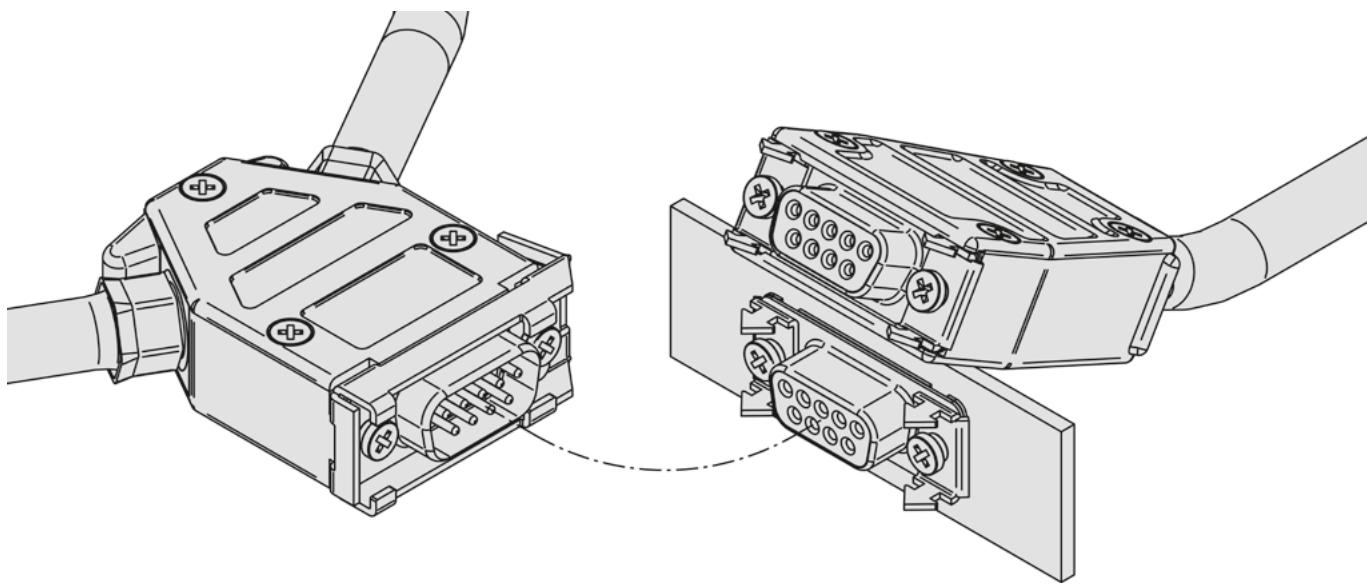
## M3 series with automatic slide lock

During the development process of the M3 series Inotec put special emphasis on a quick and safe locking also in unfavorable assembly conditions. Especially for applications requiring frequent mating cycles as well as a reliable protection against unintended disconnecting, the M3 series is a perfect and robust solution.

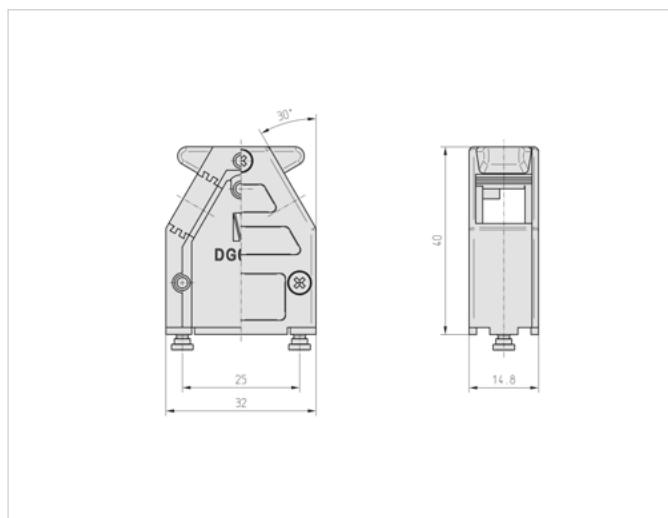
When the connector is plugged in, the slide snaps automatically into the locking position. Only for unlocking the mechanism has to be activated manually. By its well defined spring force and a sufficiently large spring travel, the system is safe from any unintended unlocking and disconnection.

### Special features:

- Safe and tool-free assembly of the locking spring
- Special blanket geometry for an optimal guidance of the lock slide
- Thread-forming locking screws for a safe fixation of the slide



## DG09M3



### Specifications

- For 9-way D-Sub and HD15 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp) and 14,8 mm width
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5 \*
- 3 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

### Accessories

- Automatic slide lock

Art.-No.  
ED09VL

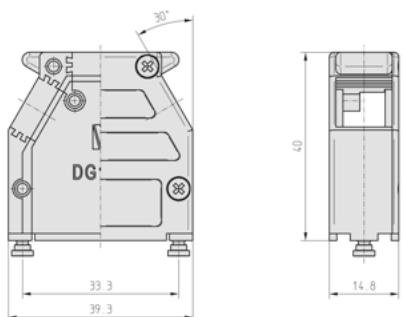
All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





**DG15M3**



**Specifications**

- For 15-way D-Sub and HD26 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp) and 14,8 mm width
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

**Art.-No.**  
ED15VL

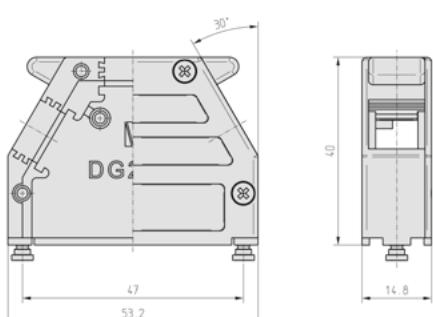
**Scope of supply**

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

**Accessories**

- Automatic slide lock

**DG25M3**



**Specifications**

- For 25-way D-Sub or HD44 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp) and 14,8 mm width
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

**Art.-No.**  
ED25VL

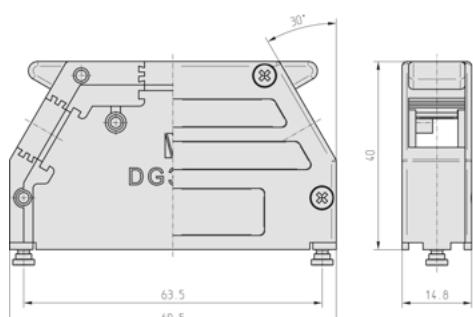
**Scope of supply**

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

**Accessories**

- Automatic slide lock

**DG37M3**



**Specifications**

- For 37-way D-Sub and HD62 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp) and 14,8 mm width
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1  
DZ-AS1

**Art.-No.**  
ED37VL

**Scope of supply**

- 1 pc. full metal hood with cover
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x7 \*
- 2 pcs. shoulder screws\*

**Accessories**

- Automatic slide lock



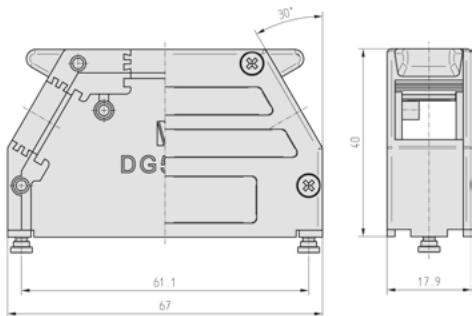
All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



## M3 series

### DG50M3



#### Specifications

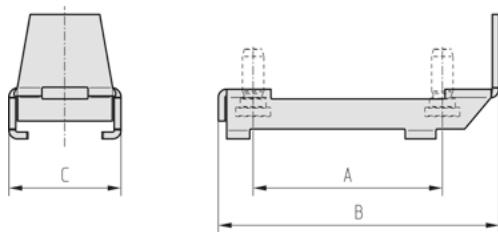
- For 50-way D-Sub and HD78 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp) and 17,9 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS200

#### Spare part Art.-No.

DBS200  
DZ-ES1  
DZ-SS1  
DZ-AS1

Art.-No.  
ED50VL

### EDxxVL



#### Specifications

- Sliding part in stainless steel
- Including flat spring (to locate in M3 hood) DGxxM3
- Width of sliding part 9- to 37-way
- Width of sliding part 50-way

15,2 mm  
18,0 mm

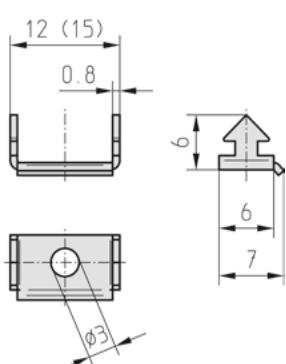
#### Hood size

Hood size	A	B	C	Art.-No.
9-way	25,0	37,1	15,2	ED09VL
15-way	33,3	45,0	15,2	ED15VL
25-way	47,0	60,0	15,2	ED25VL
37-way	63,5	76,6	15,2	ED37VL
50-way	61,1	73,7	18,0	ED50VL

#### Scope of supply

- 1 pc. sliding part
- 1 pc. flat spring

### EDVL-Bx



#### Specifications

- Latches for automatic slide lock EDxxVL
- Stainless steel
- Mounted on end devices or counterconnectors

#### Art.-No.

EDVL-B1-P  
EDVL-B2

#### Scope of supply

- 2 pcs. latches 9- to 37-way (12 mm width)
- 2 pcs. latches 50-way (15 mm width)

#### Accessories

- If the latches shall be mounted on counterconnectors we recommend to use our M1 or M2 series hood.
- If the latches shall be mounted on an end device we recommend the use of centered screws like Inotec DZ-AS1\* (to be ordered separately).

All dimensions on part drawings are indicated in mm.

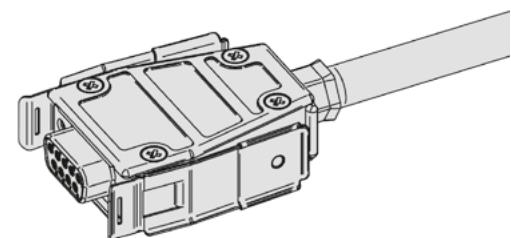
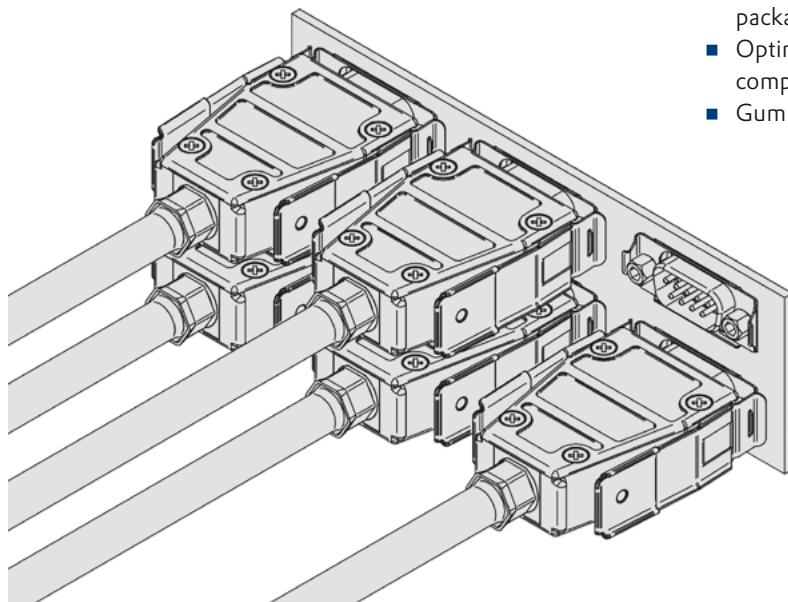
\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



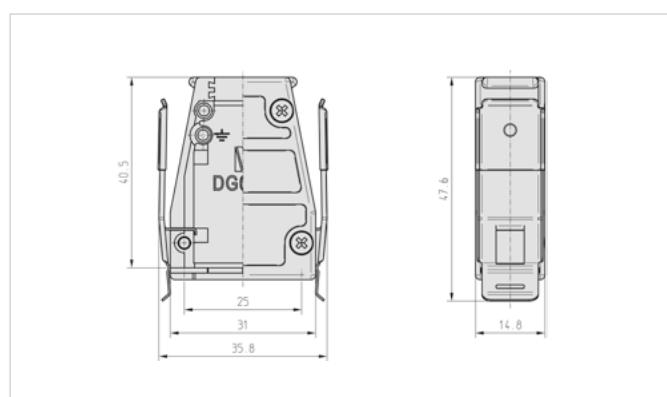


## M5 series with compact quick release lock for 9-way connector

High packaging densities and frequent reconnect cycles are typical conditions to be found on test benches or in test systems. Still the connectors have to be reliably secured against unintended release and must allow individual disassembly. The Inotec M5 series is especially designed for such requirements. The locking is carried out simply by pushing on the connector without having to activate any additional mechanism.

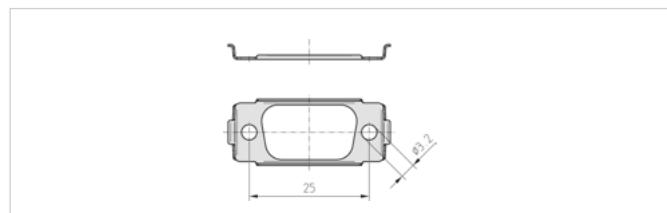


### DG09M5-C101



Fully compatible with Inotec coding system

### Locking frame DV09RH



#### Specifications

- For 9-way D-Sub and HD15 connectors
- Compact design, 47,6 mm height (without crimp flange or cable clamp) and 35,8 x 14,8 mm ground surface for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x

#### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. spring latches (pre-assembled)
- 1 pc. grounding screw M2,5x4,5 \*
- 4 pcs. cover screws M2,5x6

**Spare part Art.-No.**

DZ-ES1  
DZ-SS3

#### Options

- DG09M5 is optionally available without locking system and female thread 4-40 UNC
- May be used as counterconnector for couplings with/without Inotec coding system

#### Specifications

- Locking frame for DG09M5-C101
- Made in stainless steel
- May be mounted on terminal devices or counterconnectors

#### Scope of supply

- 1 pc. locking frame

**Spare part Art.-No.**

DV09RH

#### Accessories

- Locking bolt (see page 12)

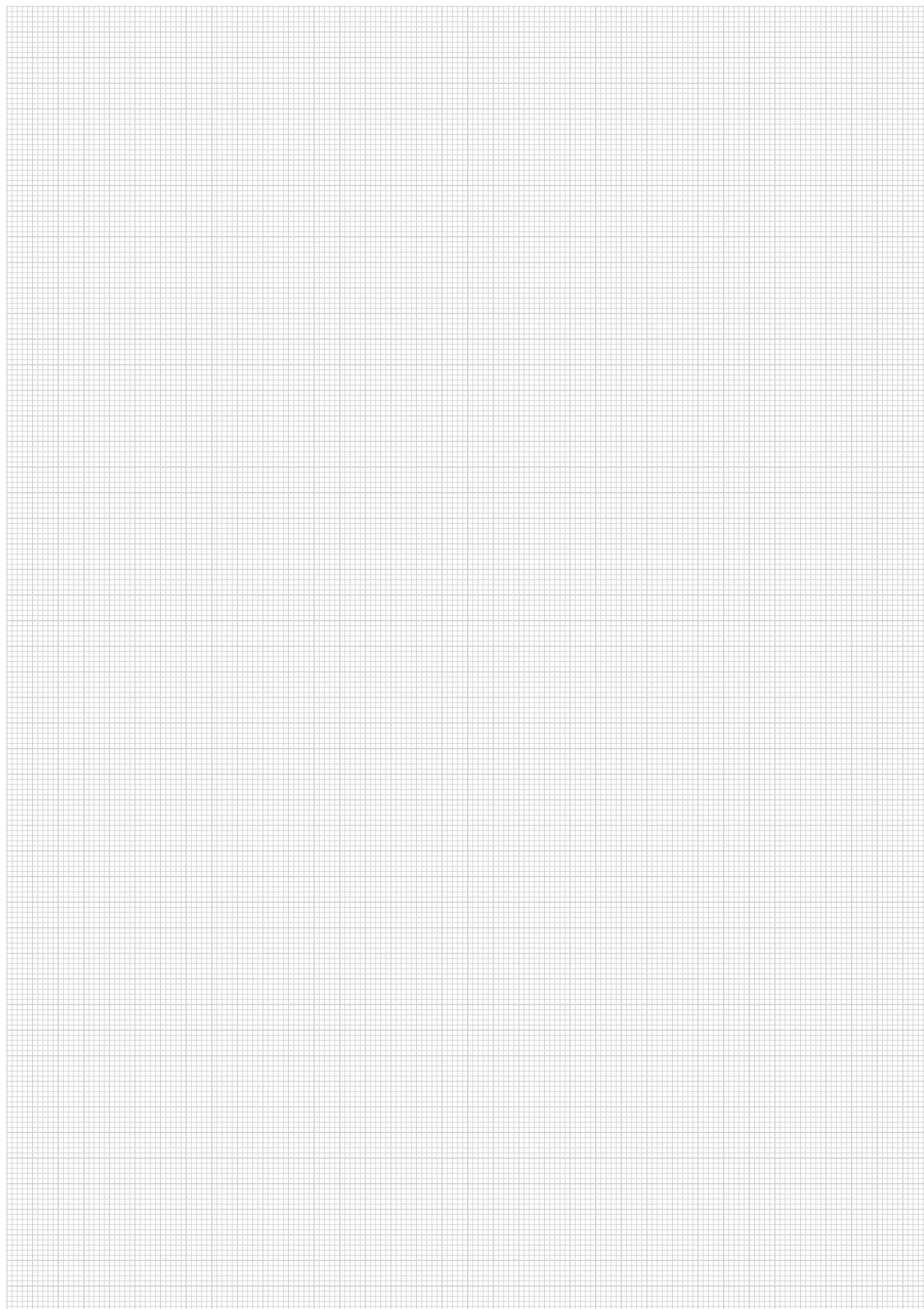
**Art.-No.**

DV-B1/1



All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,45 Nm.





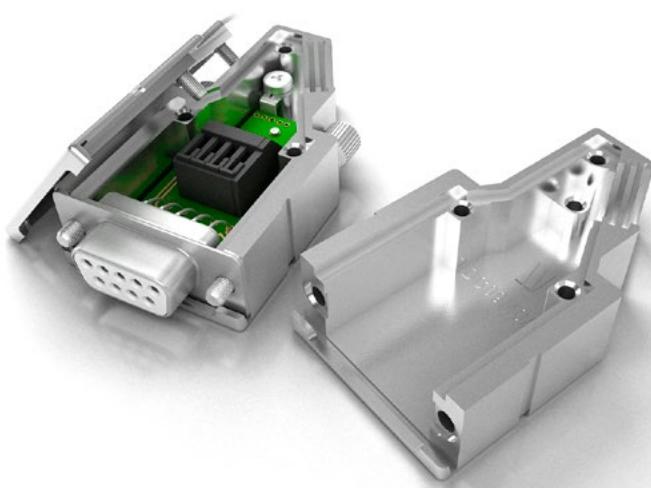
## **D-Sub full metal hoods with screw locking**

D-Sub interfaces with a firm screw locking between connector hood and counter-connector are indispensable for all applications being exposed to e.g. mechanical stress (vibration, traction, bending) or significant temperature variations, but which are nevertheless supposed to provide reliable locking, free from clearance.

Hence, a screw-locked interface does not only ensure a reliable electrical contacting between the connectors. In combination with a full metal hood they also improve

the ground contact and thereby the EMC of the interconnection. Furthermore, the screw connections have to allow a quick and simple assembly; they should not corrode under adverse environmental conditions and should be easily un- and re-tightened even after a longer period of installation.

As a specialist for EMI / RFI shielding interconnection systems Inotec electronics offers the widest product range of full metal hoods for D-Sub connectors with its series MS, MSX, MSB and MSBS.



**Inotec offers the widest range of high-quality EMC-performing D-Sub hoods with screw locking:**

- EMC-oriented hood design
- HF-protected full metal hoods made of die-cast zinc with labyrinth cover
- Unused cable entries are sealed against HF interferences with blind plugs
- Integrated grounding point
- Ergonomic hood design (avoids pulling on the cable)
- Inotec crimp flange technology with dovetail design ensures minimum transition resistances to shielded cables
- High-end corrosion resistant locking screws ensure a safe connection with extreme mechanical resilience and resistance against vibrations
- Locking screws are secured against loss by an integrated retention geometry
- All screws are available in 4-40 UNC or M3 threading with various head shapes
- Interference-free and constant ground contact towards the mating connector
- Optionally available with preparation for the Inotec coding system (to avoid mismatching of connectors)

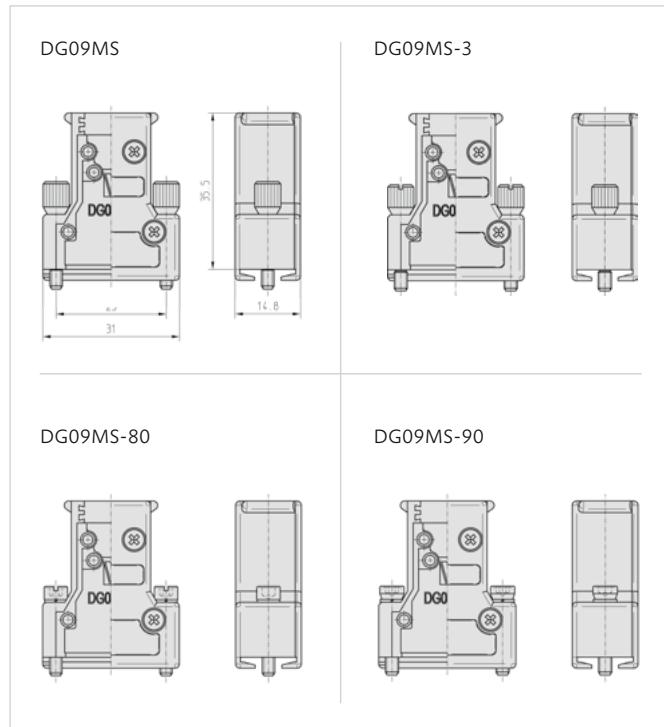
# MS series

## MS series with screw locking

The universal D-Sub hood series for all numbers of poles with up to 3 cable outlets is available as compact standard geometry as well as extended version with additional space e.g. for special wiring or integration of a PCB.

The wide range of fitting options with classical knurled head as well as hexagon socket screw heads gives a suitable solution for any assembly situation.

## DG09MS / -3 and DG09MS-80 / -90

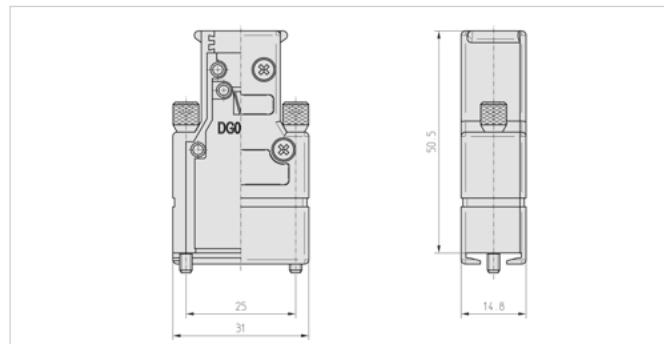


DG09MS-80-KOD  
DG09MS-90-KOD



DG09MS, DG09MS-80  
DG09MS-3, DG09MS-85, DG09MS-90

## DG09MS-4



on request



DG09MS-4-3  
DG09MS-4-C104 (4-40 UNC female thread for couplings)

All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.

A different shape of their screw heads allows an easy distinction between hoods with 4-40 UNC (standard) and M3 screws. All hoods are delivered with pre-assembled locking screws. The screws are held in position by an integrated retention system. At the end of catalogue you will find our **hood selector (pp. 76, 77)** giving an overview of all available standard hood types.

### Specifications

- For 9-way D-Sub and HD15 connectors
- Compact design, 35,5 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws 4-40 UNC (mounted with anti-loss indent)
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

### Screw options

- Inotec hoods with screw locking are available with different screw options like shown on the adjacent picture
- All standard hood sizes (DGxxMS and DGxxMS-1) are available in either 4-40 UNC or M3 screws with knurled heads or hexagon socket
- Extended hood versions of the MS series are already equipped with a combination of knurled head and hexagon socket, also available in 4-40 UNC or M3

### DG09MS screw options available

<b>Art.-No.</b>	
DG09MS	DG09MS
DG09MS-3	DG09MS-3
DG09MS-80	DG09MS-80
DG09MS-90	DG09MS-90

Please refer to pages 76/77 for all hood and locking screw combinations available.

### Specifications

- For 9-way D-Sub and HD15 connectors
- Extended version with 50,5 mm height (without crimp flange or cable clamp), suitable for integrated PCB or special wiring solutions
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws with ISK 4-40 UNC (mounted with anti-loss indent)
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

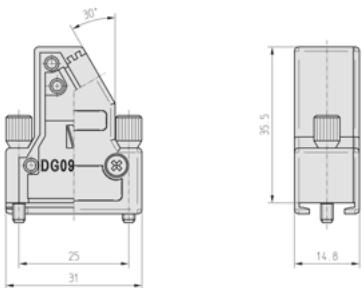
**Spare part Art.-No.**

DZ-ES1  
DZ-SS1





## DG09MS-1



### Specifications

- For 9-way D-Sub and HD15 connectors
- Compact design, 35,5 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 lateral cable entry (30°) for CF100/300 and DKS100

### Spare part Art.-No.

DZ-ES1  
DZ-SS1

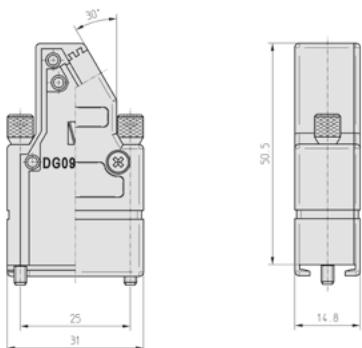


DG09MS-1-80-KOD  
DG09MS-1-90-KOD



DG09MS-1-80  
DG09MS-1-3, DG09MS-1-90

## DG09MS-2



### Specifications

- For 9-way D-Sub and HD15 connectors
- Extended version with 50,5 mm height (without crimp flange or cable clamp), suitable for integrated PCB or special wiring solutions
- 14,8 mm width for high packing density
- 1 lateral cable entry (30°) for CF100/300 and DKS100

### Spare part Art.-No.

DZ-ES1  
DZ-SS1

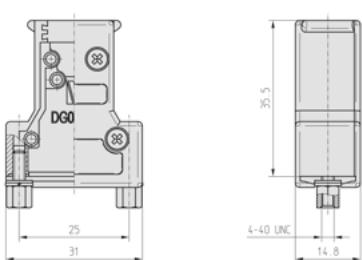


DG09MS-2-KOD  
DG09MS-2-3-KOD



DG09MS-2-3

## DG09MS-61



### Specifications

- Counter connector hood for 9-way D-Sub or HD15 connectors
- Compact design, 35,5 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS100

### Spare part Art.-No.

DZ-ES1  
DZ-SS1



counter connector hoods suitable for coding are  
DG09M1-4-40 and DG09M5



Hexagon bolt M3: DG09MS-63



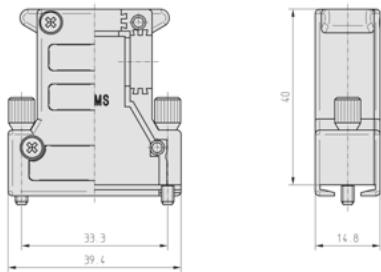
All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.

# MS series

## DG15MS



DG15MS-80-KOD  
DG15MS-90-KOD



DG15MS-80  
DG15MS-3, DG15MS-85, DG15MS-90

### Specifications

- For 15-way D-Sub and HD26 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 1 lateral cable entry (90°) for CF100/300 and DKS100

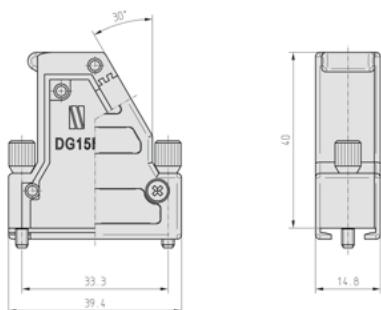
### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws 4-40 UNC (mounted with anti-loss indent)
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

## DG15MS-1



DG15MS-1-80-KOD  
DG15MS-1-90-KOD



DG15MS-1-80  
DG15MS-1-3, DG15MS-1-90

### Specifications

- For 15-way D-Sub and HD26 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 lateral cable entry (30°) for CF100/300 and DKS100

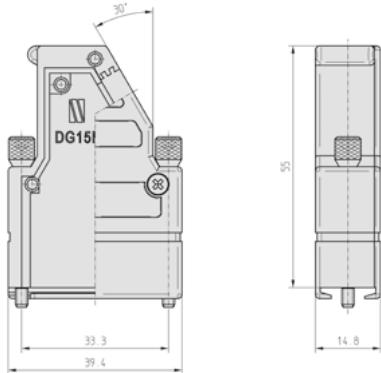
### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws 4-40 UNC (mounted with anti-loss indent)
- 1 pc. grounding screw M2,5x4,5\*
- 3 pcs. cover screws M2,5x7\*

### Spare part Art.-No.

DZ-ES1  
DZ-SS1

## DG15MS-2



on request



DG15MS-2-3

### Specifications

- For 15-way D-Sub and HD26 connectors
- Extended version with 55 mm height (without crimp flange or cable clamp), suitable for integrated PCB or special wiring solutions
- 14,8 mm width for high packing density
- 1 lateral cable entry (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws with ISK 4-40 UNC (mounted with anti-loss indent)
- 1 pc. grounding screw M2,5x4,5\*
- 3 pcs. cover screws M2,5x7\*

### Spare part Art.-No.

DZ-ES1  
DZ-SS1

All dimensions on part drawings are indicated in mm.

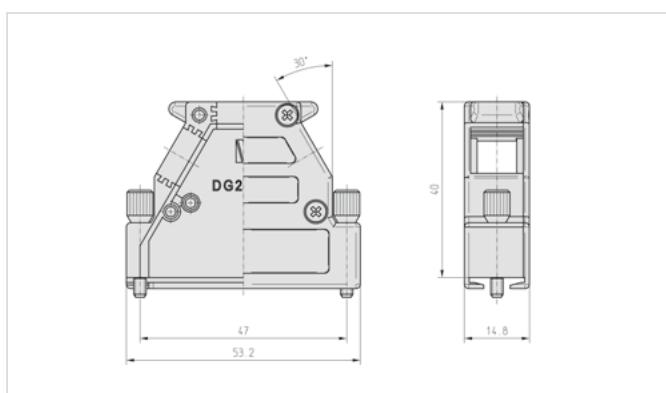
Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





## DG25MS

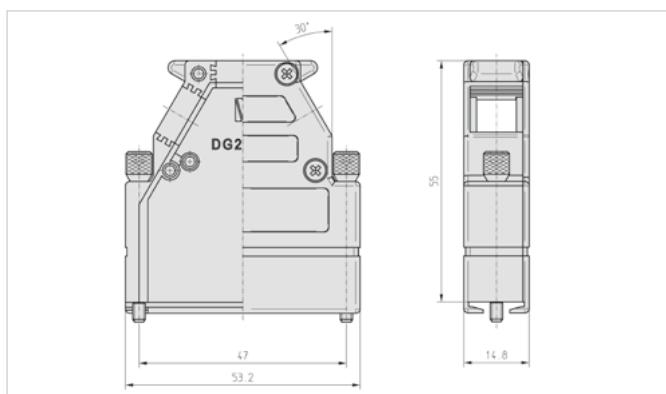


DG25MS-80-KOD  
DG25MS-90-KOD



DG25MS-80  
DG25MS-3, DG25MS-85, DG25MS-90

## DG25MS-2

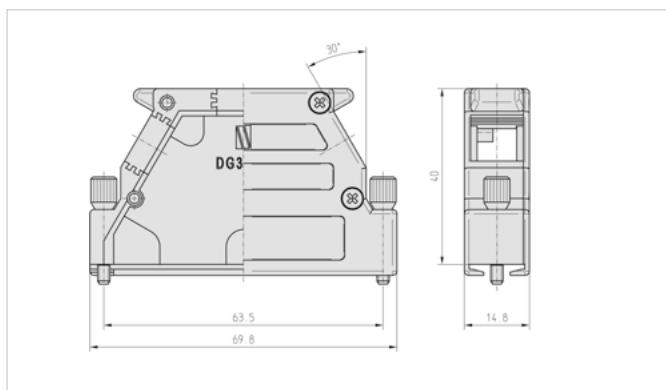


DG25MS-2-85-KOD  
4-40 UNC on request



DG25MS-2-3  
DG25MS-2-85

## DG37MS



DG37MS-80-KOD  
DG37MS-90-KOD



DG37MS-80  
DG37MS-3, DG37MS-90

### Specifications

- For 25-way D-Sub and HD44 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws 4-40 UNC (mounted with anti-loss indent)
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

### Specifications

- For 25-way D-Sub and HD44 connectors
- Extended version with 55 mm height (without crimp flange or cable clamp), suitable for integrated PCB or special wiring solutions
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws with ISK 4-40 UNC (mounted with anti-loss indent)
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

### Specifications

- For 37-way D-Sub and HD62 connectors
- Compact design, 40 mm height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws 4-40 UNC (mounted with anti-loss indent)
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

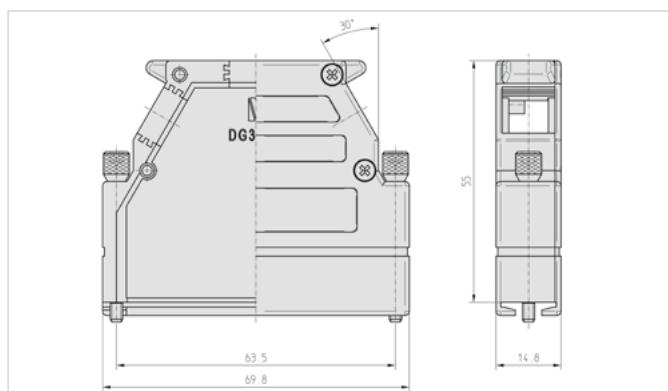
\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





# MS series

## DG37MS-2



on request



DG37MS-2-3

### Specifications

- For 37-way D-Sub and HD62 connectors
- Extended version with 55 mm height (without crimp flange or cable clamp), suitable for integrated PCB or special wiring solutions
- 14.8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x
- 2 lateral cable entries (30°) for CF100/300 and DKS100

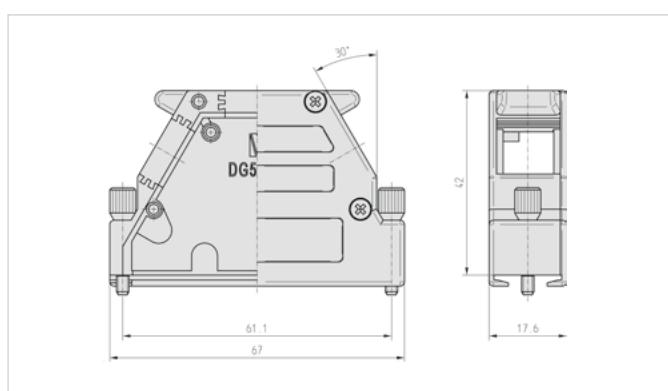
### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws with ISK 4-40 UNC (mounted with anti-loss indent)
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1

## DG50MS



on request



DG50MS-80  
DG50MS-3, DG50MS-90

### Specifications

- For 50-way D-Sub and HD78 connectors
- Compact design, 42 mm height (without crimp flange or cable clamp)
- 17.6 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS200

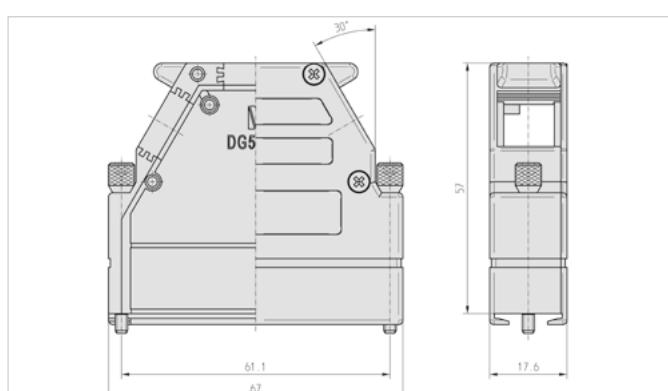
### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws 4-40 UNC (mounted with anti-loss indent)
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS200  
DZ-ES1  
DZ-SS1

## DG50MS-2



on request



DG50MS-2-3

### Specifications

- For 50-way D-Sub and HD78 connectors
- Extended version with 57 mm height (without crimp flange or cable clamp), suitable for integrated PCB or special wiring solutions
- 17.6 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS200

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws with ISK 4-40 UNC (mounted with anti-loss indent)
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS200  
DZ-ES1  
DZ-SS1

All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





## MSX series – for highest operational safety

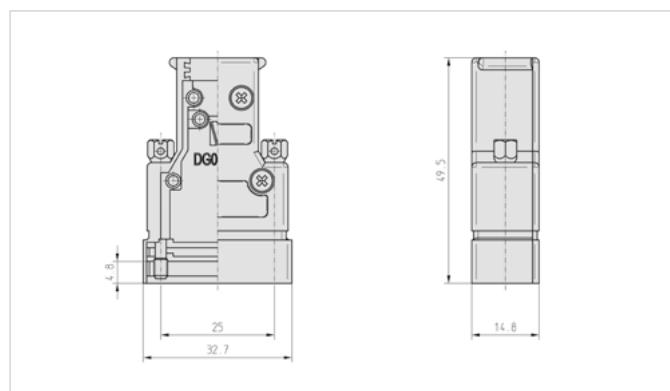
The MSX hood series has been developed for highly sensitive fields of application using high frequencies and / or high interference levels. When tightening the locking screws the extended blanket of the hood is pressed down to the front panel, closing the gap between connector and device and creating an additional ground contact that generates a maximum shielding of the transferred data and signals. Furthermore, special screws with a sealing bore in the screw head permit to seal the assembled hood and thus protect it against unauthorized manipulation.

### Special features:

- Extended "close-the-gap" blanket for an interference-free connection to a terminal device
- Large interior space e.g. for installation of mixed connectors or integration of PC boards
- Pre-assembled and retained M3 screws with sealing bores
- **Attention:** mating connector must be mounted in rear panel configuration and panel thickness must be kept between 2,0 and 2,5 mm.



## DG09MSX



suitable for coding



only available with M3 jackscrews

### Specifications

- For 9-way D-Sub and HD15 connectors
- 49,5 mm total height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS10x

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws M3, slotted with cross bore for sealing
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

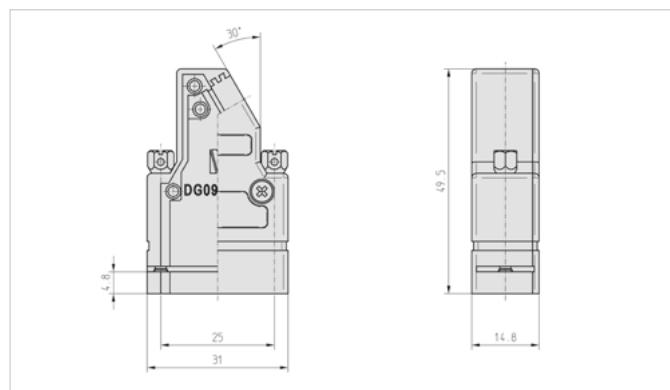
DZ-ES1  
DZ-SS1

### Accessories

- Female jackscrews for device-side connector (compulsory to achieve max. shielding)

**Art.-No.**  
DV-B3/1-2

## DG09MS-1X



not compatible with Inotec coding system



only available with M3 jackscrews

### Specifications

- For 9-way D-Sub and HD15 connectors
- 49,5 mm total height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 lateral cable entry (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws M3, slotted with cross bore for sealing
- 1 pc. grounding screw M2,5x4,5\*
- 3 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

### Accessories

- Female jackscrews for device-side connector (compulsory to achieve max. shielding)

**Art.-No.**  
DV-B3/1-2



All dimensions on part drawings are indicated in mm.

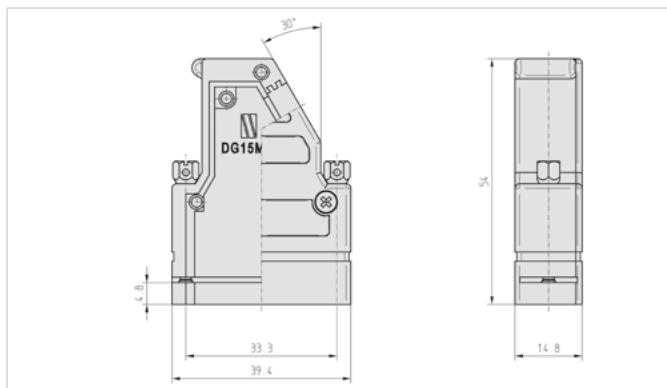
Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



# MSX series

## DG15MSX

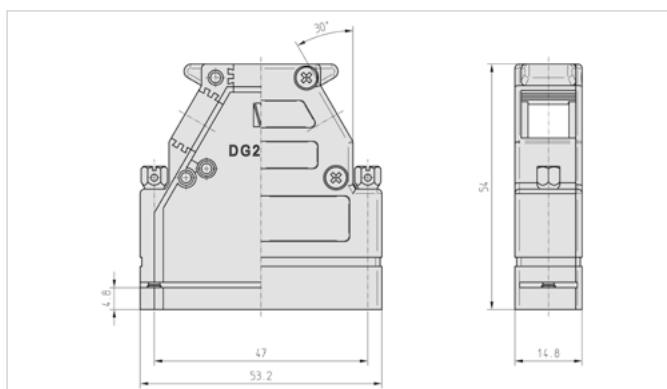


not compatible with Inotec coding system



only available with M3 jackscrews

## DG25MSX

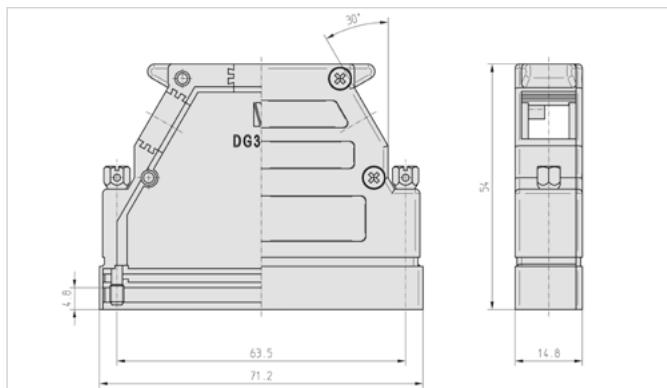


not compatible with Inotec coding system



only available with M3 jackscrews

## DG37MSX



suitable for coding



only available with M3 jackscrews

### Specifications

- For 15-way D-Sub and HD26 connectors
- 54 mm total height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 lateral cable entry (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws M3, slotted with cross bore for sealing
- 1 pc. grounding screw M2,5x4,5\*
- 3 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

### Accessories

- Female jackscrews for device-side connector (compulsory to achieve max. shielding)

**Art.-No.**  
DV-B3/1-2

### Specifications

- For 25-way D-Sub and HD44 connectors
- 54 mm total height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS100
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws M3, slotted with cross bore for sealing
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1

### Accessories

- Female jackscrews for device-side connector (compulsory to achieve max. shielding)

**Art.-No.**  
DV-B3/1-2

### Specifications

- For 37-way D-Sub and HD62 connectors
- 54 mm total height (without crimp flange or cable clamp)
- 14,8 mm width for high packing density
- 1 straight cable entry (0°) for CF100/300 and DKS100
- 2 lateral cable entries (30°) for CF100/300 and DKS100

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws M3, slotted with cross bore for sealing
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS100  
DZ-ES1  
DZ-SS1

### Accessories

- Female jackscrews for device-side connector (compulsory to achieve max. shielding)

**Art.-No.**  
DV-B3/1-2

All dimensions on part drawings are indicated in mm.

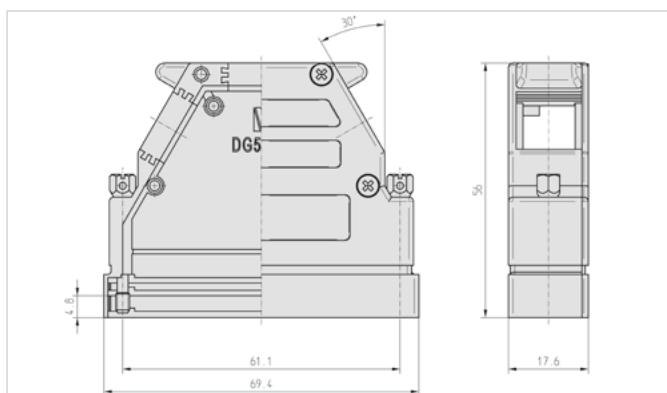
Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





## DG50MSX

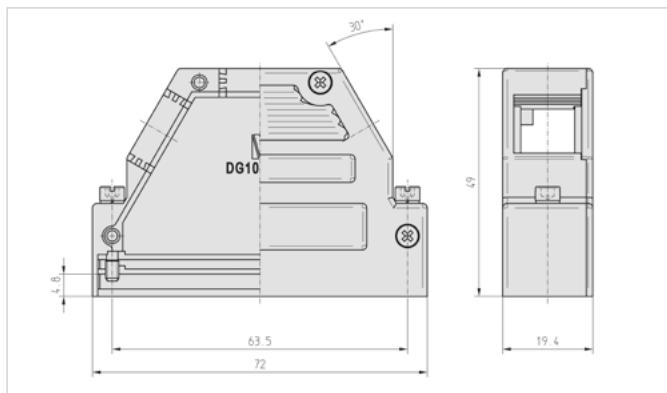


coding version on request



only available with M3 jackscrews

## DG104MSX

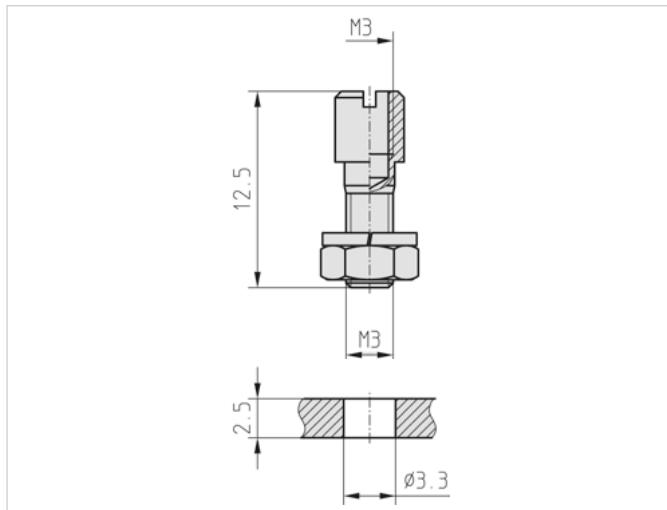


coding version on request



M3 screws on request

## Female jackscrew DV-B3/1-2



### Specifications

- For 50-way D-Sub and HD78 connectors
- 56 mm total height (without crimp flange or cable clamp)
- 17.6 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS20x

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws M3, slotted with cross bore for sealing
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS200  
DZ-ES1  
DZ-SS1

### Accessories

- Female jackscrews for device-side connector (compulsory to achieve max. shielding)

**Art.-No.**  
DV-B3/1-2

### Specifications

- For 104-way D-Sub connectors (type F)
- 49 mm total height (without crimp flange or cable clamp)
- 19.4 mm width
- 1 straight cable entry (0°) for CF200 and DKS20x
- 2 lateral cable entries (30°) for CF200 and DKS20x

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon socket screws 4-40 UNC, slotted
- 2 pcs. spring washers
- 2 pcs. blind plugs
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DBS200  
DZ-ES1  
DZ-SS1

### Specifications

- Special female jackscrew to fix MSX hoods on end devices
- Only for rear-panel assembly of connectors
- Maximum front panel thickness 2,5 mm
- 3,3 mm passage hole on front panel required for centering

### Scope of supply

- 2 pcs. female jackscrews M3
- 2 pcs. spring washers
- 2 pcs. nuts M3



All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.

# MSB series

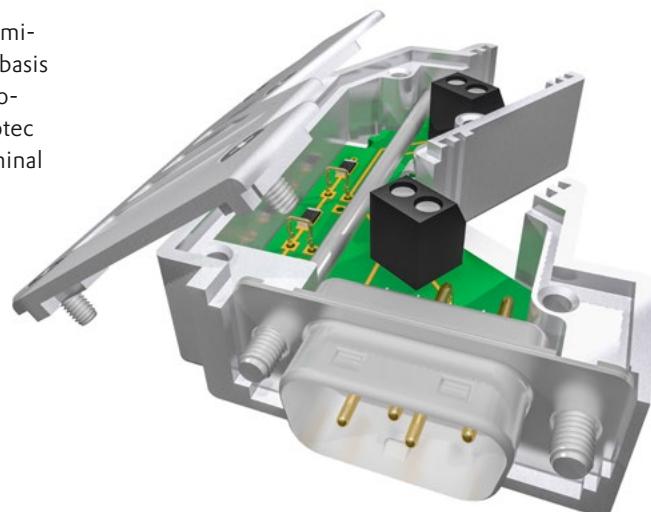


## MSB series – the universal BUS connector hood

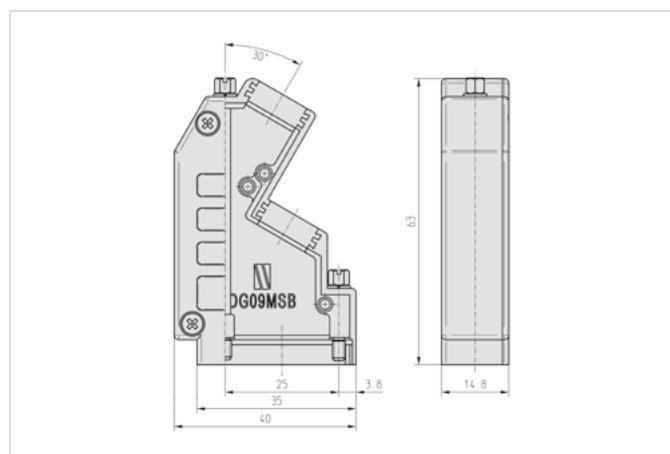
D-Sub connectors are still a preferred interface for the integration of terminal devices in BUS systems. With the MSB series Inotec offers a perfect basis for interference-protected EMC BUS connectors. It allows the use of Inotec's unique crimp flange system with dovetail design. Upon request Inotec provides completely assembled MSB connectors as intermediate or terminal version for all common BUS systems.

### Special features:

- Locking screws with 4-40 UNC or M3 thread, pre-assembled with integrated retention
- Two steplike 30° cable inlets do permit a space-saving cabling especially for large bending radii
- Compact outer dimensions permit a closely packed side-by-side mounting
- Spacious interior for easy integration of PCBs
- Long blanket for efficient shielding even in high interference levels



## DG09MSB



DG09MSB-91

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for 9-way D-Sub or HD15
- 2 parallel lateral cable entries (30°) for CF100/300 or DKS10x (only upper entry)
- Hood geometry especially designed for BUS-systems, completely equipped connectors for all common BUS-types available on request

### Scope of supply

- 1 pc. full metal hood with cover
- 1 pc. hexagon head screw, slotted 4-40 UNCx16,5 mm
- 1 pc. hexagon head screw, slotted 4-40 UNCx58,5 mm
- 2 pcs. spring washers
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

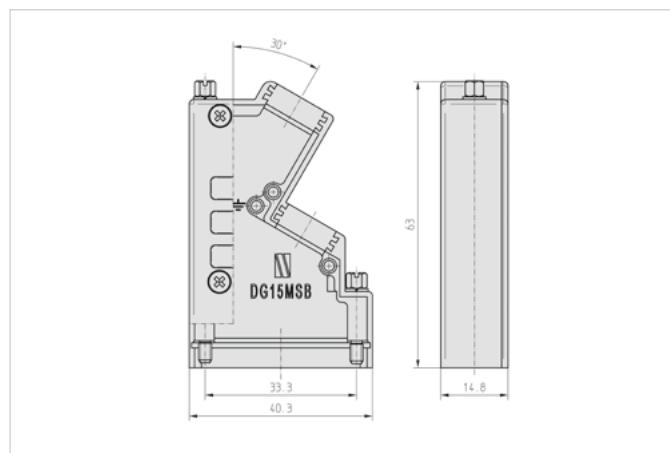
Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

Art.-No.

DG09MSB-C102  
DG09MSB-91-C101

## DG15MSB



DG15MSB-91

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for 15-way D-Sub or HD26
- 2 parallel lateral cable entries (30°) for CF100/300 or DKS10x (only upper entry)
- Hood geometry especially designed for BUS-systems, completely equipped connectors for all common BUS-types available on request

### Scope of supply

- 1 pc. full metal hood with cover
- 1 pc. hexagon head screw, slotted 4-40 UNCx16,5 mm
- 1 pc. hexagon head screw, slotted 4-40 UNCx58,5 mm
- 2 pcs. spring washers
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

Art.-No.

DG15MSB-C102  
DG15MSB-91-C101

All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



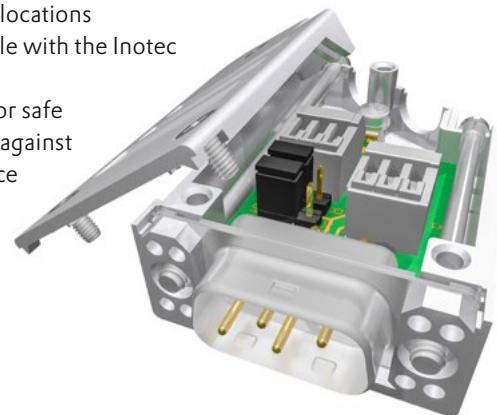


## MSBS Series – compact BUS hood for extremely limited installation spaces

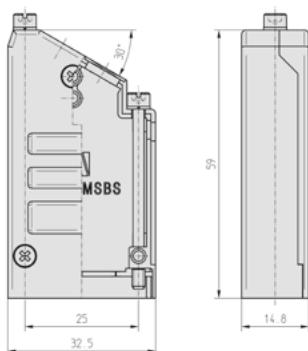
Weight saving and maximum packing closeness are essential design premises for nearly all industrial communication systems. Offering a compact MSBS hood Inotec takes account of these requirements. Being designed as a BUS connector it is available as 9-way version only. As a result of the relatively small diameters of commonly used data cables Inotec could develop a space-saving crimp flange design named CF400, allowing to place 2 parallel 30° cable outlets and therefore to maximize the available installation space inside the hood. The DG09MSBS is available as hood only as well as completely assembled BUS connector for all common systems.

### Special features:

- Compact design allows maximum closest packaging
- Special crimp flange geometry CF400 for BUS cables
- Free access to locking screws, even in installations in problematic locations
- Fully compatible with the Inotec coding system
- Long blanket for safe shielding even against high disturbance levels



## DG09MSBS



### Specifications

- HF-interference-proof full metal hood with labyrinth cover
- For 9-way D-Sub or HD15 connectors
- Slim design (32,5 mm)
- 2 parallel cable entries CF400, 30°

### Scope of supply

- 1 pc. full metal hood with cover
- 1 pc. hexagon socket screw, slotted 4-40 UNCx40,2
- 1 pc. hexagon socket screw, slotted 4-40 UNCx57,5
- 2 pcs. spring washers
- 1 pc. grounding screw M2,5x4,5\*
- 3 pcs. cover screws M2,5x6\*

**Spare part Art.-No.**

DZ-ES1  
DZ-SS3

### Options

- If required (e.g. in case of interfering contours on the end device) the hood may be supplied with short blanket.

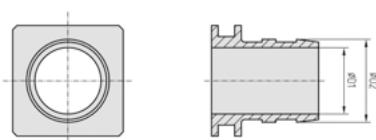


all variants fully compatible with Inotec coding system



with M3 hexagon socket screws: DG09MSBS-91

## Crimp flange CF400-x/x



### Specifications

- Special crimp flange for hood series DG09MSBS
- To be assembled in combination with CH-x/x ferrule, according to Inotec crimp data sheet and crimp procedure (see chapter EMC-compliant cable connections)
- Max. 6,5 mm passage diameter for wires

### Scope of supply

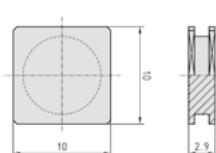
- 1 pc. crimp flange

the numbers x/x included in the articles number indicate the inner and outer flange diameter D1/D2

**Einzelteil-Art.-No.**

CF400-x/x

## Blind plug DBS400



### Specifications

- Special blind plug for hood series DG09MSBS
- For HF sealing of obsolete cable entries
- Special configurations (e.g. integrated control LED) may be added on request

### Scope of supply

- 1 pc. blind plug

**Art.-No.**

DBS400



All dimensions on part drawings are indicated in mm.

Variant types and article numbers are indicated in the hood selector (pp. 76, 77).

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,45 Nm.



# MSBS series

## MSBS Series – completely assembled BUS connectors

Inotec manufactures and offers not only standard hoods for free assembly but also completely assembled connector hoods for all common BUS systems. The special crimp flanges for and ferrules for cable assembly are provided separately in accordance with the cable-specific crimp data definition. Please feel free to ask for customized configurations.

### Special features:

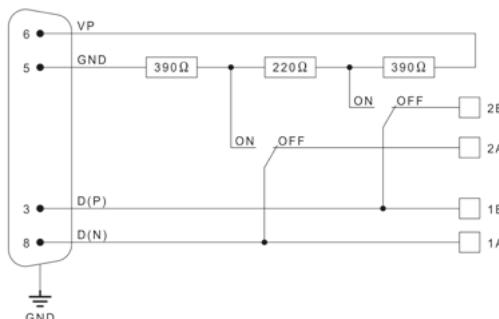
- Suitable for field assembly, traction relief and shield connection with Inotec crimp flange CF400
- Quick and safe wire connection with cage clamp terminals
- Available either as male or female type with 4-40 UNC or M3 locking screws
- Also available completely equipped with the original Inotec coding system

## Profibus



### Specifications

- BUS-connector for Profibus networks
- Assigned contacts 3, 5, 6 and 8
- Two jumpers allow to switch between „intermediate“ or „terminal“ function

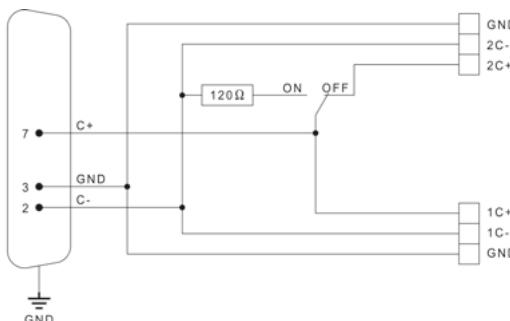


## CAN



### Specifications

- BUS-connector for CAN networks
- Assigned contacts 2, 3 and 7
- One jumper allows to switch between „intermediate“ or „terminal“ function

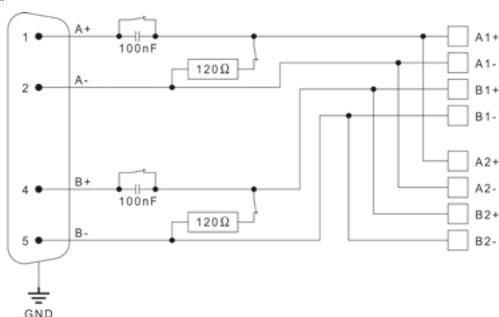


## MVB / WTB



### Specifications

- BUS-connector for MVB networks
- Assigned contacts 1, 2, 4 and 5
- Four jumpers allow to switch between „intermediate“ or „terminal“ function





## DGAM11 / DGAM30 Series – adaptor hoods for special applications

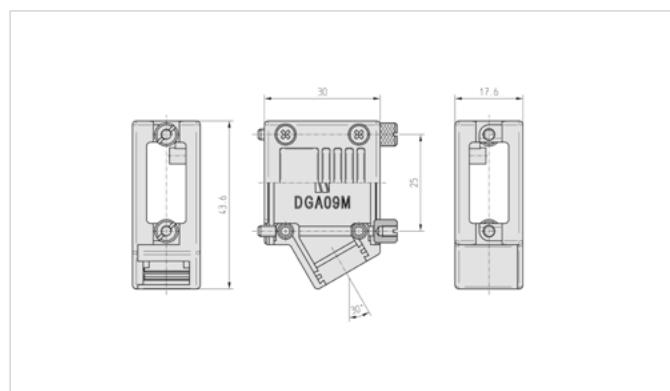
No matter if it is used as junction box, diagnostic plug or mini-computer, the DGA series offers a wide variety of applications and therefore more than complies with the designation "adaptor hood". While the extremely low-rise M11 series is particularly suitable as space-saving diagnostic plug or also as piggy-back connector or gender changer, the adaptor hood of the M30 series with its spacious interior can be equipped with complete circuits or complex cablings. Inotec optionally offers a customized design and integrated PCB for both series. Combined with the premium gold-plated Inotec solder-cup or dip-solder connectors you will receive an individual high-tech solution.

### Special features:

- Locking screws with female threaded head for piggyback assembly
- Modified version for attachment of blind plates with integrated snap-on hook
- Different versions without locking screws for setup as gender changer or coupling connector



### DGA09M11



on request



Variant with M3 female jackscrews: DGA09M11-3

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 9-way D-Sub or HD15
- 1 lateral cable entry (30°) for CF100/300 and DKS10x
- Minimal installation height (30 mm without crimp flange or cable clamp)

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws, slotted, male/female thread 4-40 UNC
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

**Art.-No.**

DBS100

DGA09L1

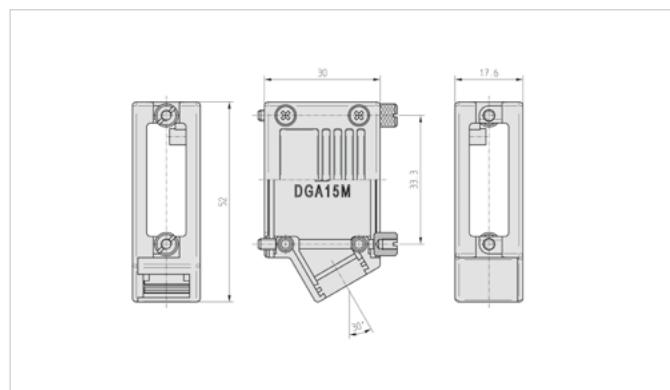
DGA09BP

DGA09BP-RC2

### Accessories

- Blind plug
- PCB with 1:1 pin connection
- Blind plate
- Blind plate with metal snap-on hook for top hat rail

### DGA15M11



on request



Variant with M3 female jackscrews: DGA15M11-3

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 15-way D-Sub or HD26
- 1 lateral cable entry (30°) for CF100/300 and DKS10x
- Minimal installation height (30 mm without crimp flange or cable clamp)

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

**Art.-No.**

DBS100

DGA15L1

DGA15BP

DGA15BP-RC2

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws, slotted, male/female thread 4-40 UNC

■ 1 pc. grounding screw M2,5x4,5\*

■ 4 pcs. cover screws M2,5x7\*

### Accessories

- Blind plug
- PCB with 1:1 pin connection
- Blind plate

DGA15BP-RC2

■ Blind plate with metal snap-on hook for top hat rail

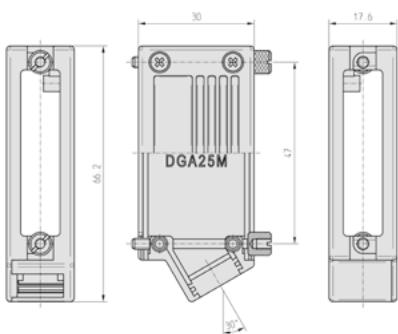


All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.

# DGA series

## DGA25M11



on request



Variant with M3 female jackscrews: DGA25M11-3

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 25-way D-Sub or HD44
- 1 lateral cable entry (30°) for CF100/300 and DKS10x
- Minimal installation height (30 mm without crimp flange or cable clamp)

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws, slotted, male/female thread 4-40 UNC
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

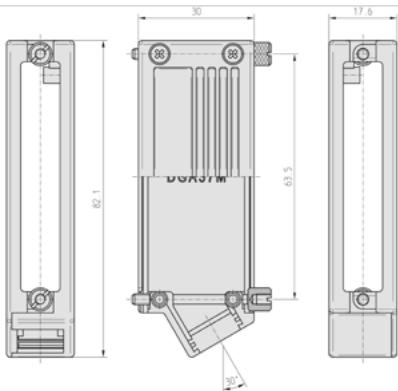
DZ-ES1  
DZ-SS1

### Accessories

- Blind plug
- PCB with 1:1 pin connection
- Blind plate
- Blind plate with metal snap-on hook for top hat rail DGA25BP-RC2

**Art.-No.**  
DBS100  
DGA25L1  
DGA25BP

## DGA37M11



on request



Variant with M3 female jackscrews: DGA37M11-3

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 37-way D-Sub or HD62
- 1 lateral cable entry (30°) for CF100/300 and DKS10x
- Minimal installation height (30 mm without crimp flange or cable clamp)

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. knurled screws, slotted, male/female thread 4-40 UNC
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

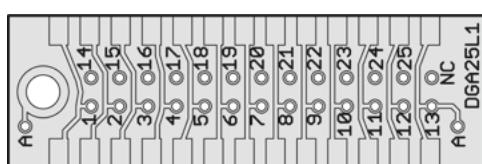
DZ-ES1  
DZ-SS1

### Accessories

- Blind plug
- PCB with 1:1 pin connection
- Blind plate
- Blind plate with metal snap-on hook for top hat rail DGA37BP-RC2

**Art.-No.**  
DBS100  
DGA37L1  
DGA37BP

## PCB DGAxxL1



### Specifications

- PCB with 1:1 pin connection between D-Sub male and female connectors
- PCB outline is designed for DGAxxM11 hoods with Inotec solder cup connectors

**Art.-No.**

DGA09L1  
DGA15L1  
DGA25L1  
DGA37L1

### Standard versions

- PCB for 9-pol. D-Sub connector
- PCB for 15-pol. D-Sub connector
- PCB for 25-pol. D-Sub connector (see image)
- PCB for 37-pol. D-Sub connector

### Options

- Please contact us for other PCB designs

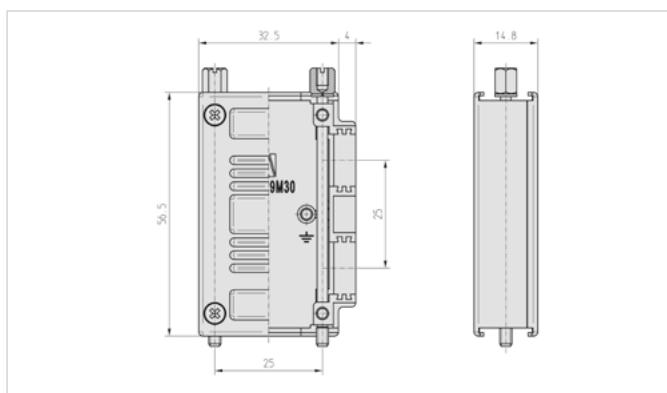
All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





## DGA09M30



 Available on request as coupling connector suitable for coding

 M3 jackscrews with hexagon socket: DGA09M30-91  
(Attention, M3 version not suitable for piggyback installation)

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 9-way D-Sub or HD15
- 2 lateral cable entries (90°) for CF100/300 and DKS10x
- Large inside space for special assemblies or integrated PCB
- Slim design (14,8 mm) for high packing density

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws, slotted, female thread 4-40 UNC
- 2 pcs. spring washers
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x6\*

### Spare part Art.-No.

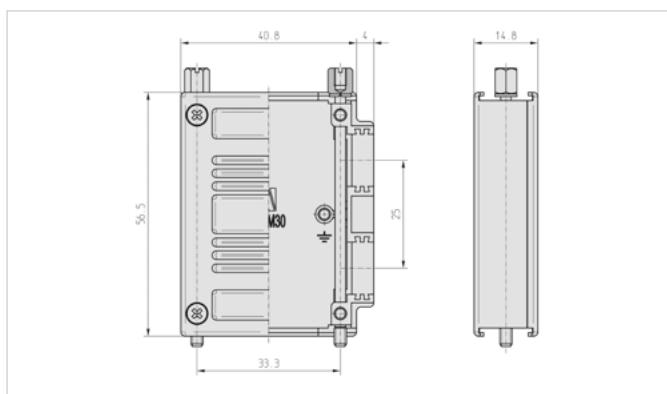
DBS100  
DZ-ES1  
DZ-SS3

Art.-No.  
DBS100  
DGA09M30BP  
DGA09M30BPO

### Accessories

- Blind plug
- Blind plate with passage holes
- Blind plate without passage holes

## DGA15M30



 Available on request as coupling connector suitable for coding

 M3 jackscrews with hexagon socket: DGA15M30-91  
(Attention, M3 version not suitable for piggyback installation)

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 15-way D-Sub or HD26
- 2 lateral cable entries (90°) for CF100/300 and DKS10x
- Large inside space (56,5 mm height) for special assemblies or integrated PCB
- Slim design (14,8 mm) for high packing density

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws, slotted, female thread 4-40 UNC
- 2 pcs. spring washers
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x6\*

### Spare part Art.-No.

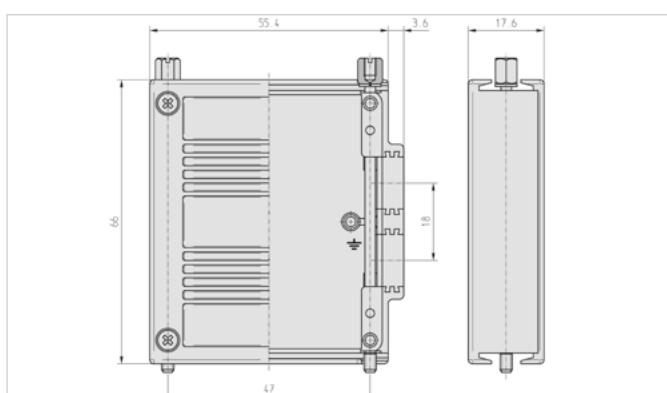
DBS100  
DZ-ES1  
DZ-SS3

Art.-No.  
DBS100  
DGA15M30BP  
DGA15M30BPO

### Accessories

- Blind plug
- Blind plate with passage holes
- Blind plate without passage holes

## DGA25M30



 Available on request as coupling connector suitable for coding

 M3 jackscrews with hexagon socket on request  
(Attention, M3 version not suitable for piggyback installation)

### Specifications

- HF-interference-proof full metal hood with labyrinth cover for two 25-way D-Sub or HD44
- 2 lateral cable entries (90°) for CF100/300 (DKS10x cable clamps may only be used in one entry)
- Large inside space (66 mm height) for special assemblies or integrated PCB

### Scope of supply

- 1 pc. full metal hood with cover
- 2 pcs. hexagon head screws, slotted, female thread 4-40 UNC
- 2 pcs. spring washers
- 1 pc. blind plug
- 1 pc. grounding screw M2,5x4,5\*
- 4 pcs. cover screws M2,5x6\*

### Spare part Art.-No.

DBS100  
DZ-ES1  
DZ-SS1

Art.-No.  
DBS100  
DGA25BP  
DGA25BP-RC2

### Accessories

- Blind plug
- Blind plate with passage holes
- Blind plate with metal snap-on hook for top hat rail DGA25BP-RC2

All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,45 Nm.

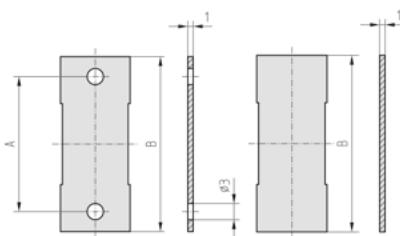




# DGA series

## Serie DGA Accessories

### Blind plate DGAXxM30BP/DGAXxM30BPO



#### Specifications

- May be used for closing obsolete connector openings in DGA09M30 and DGA15M30 hoods
- Blind plates without passage holes for hood setups without locking screws (e.g. as coupling connector or splitter)
- Suitable for customized modification (e.g. integrated LED or switches)

#### Blind plate with clearance holes

- Blind plate A 25,0 x B 32,4
- Blind plate A 33,3 x B 40,7

Art.-No.

DGA09M30BP  
DGA15M30BP

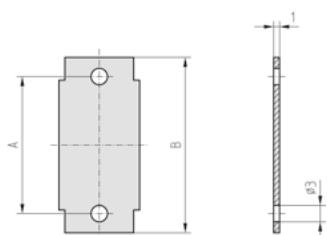
#### Blind plate without clearance holes

- Blind plate B 32,4
- Blind plate B 40,7

Art.-No.

DGA09M30BPO  
DGA15M30BPO

### Blind plate DGAXxBP



#### Specifications

- May be used for closing obsolete connector openings in DGAXxM11 and DGA25M30 hoods
- Suitable for customized modification (e.g. integrated LED or switches)

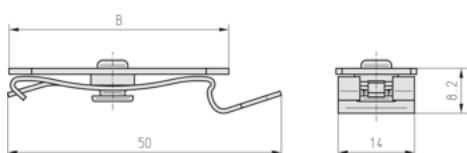
#### Blind plate with clearance holes

- Blind plate A 25,0 x B 32,0
- Blind plate A 33,3 x B 40,3
- Blind plate A 47,0 x B 55,4
- Blind plate A 63,5 x B 70,5

Art.-No.

DGA09BP  
DGA15BP  
DGA25BP  
DGA37BP

### Blind plate metal snap-on hook DGAXxBP-RC2



#### Specifications

- Blind plate with riveted snap-on hook
- Allows to fix modified M11 and DGA25M30 hoods on top hat rails
- For 35 mm top hat rail FM5/TS35
- For blind plate width B please refer to DGAXxBP

#### Standard versions

- Blind plate 9-way, metal snap-on hook FM5/TS35 DGA09BP-RC2
- Blind plate 15-way, metal snap-on hook FM5/TS35 DGA15BP-RC2
- Blind plate 25-way, metal snap-on hook FM5/TS35 DGA25BP-RC2
- Blind plate 37-way, metal snap-on hook FM5/TS35 DGA37BP-RC2

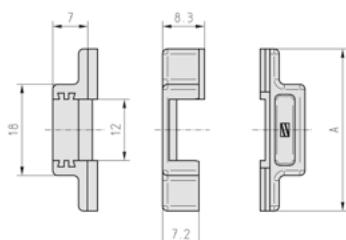
Art.-No.

DGA09BP-RC2  
DGA15BP-RC2  
DGA25BP-RC2  
DGA37BP-RC2

#### Options

- Blind plate with plastic snap-on hook for top hat rail (no image)

### Crimpadaptor



#### Specifications

- The adaptor shells for DGA09M30 and DGA15M30 hoods allow the use of a connector opening as additional cable entry
- Half shells in die-cast zinc with Inotec crimp flange interface
- Suitable for CF100/300 crimp flanges and DKS10x cable clamps

#### Standard versions

- 2 pcs. crimpadaptor half shells 9-way (Length A = 32,0 mm)
- 2 pcs. crimpadaptor half shells 15-way (Length A = 40,3 mm)

Art.-No.

CA09M30  
CA15M30

All dimensions on part drawings are indicated in mm.





## Customized solutions

Especially our DGA series hoods are offering various options for customized assemblies and specific solutions. Through their spacious interior the hoods of the M30 series are perfectly suitable for integrated PCB or a setup as junction box. On request Inotec develops and manufactures special designs to range from

modified hoods to customized kits with preassembled PCBs including the required crimp components corresponding to the cable applied. Don't hesitate to ask for your specific solution. We would be pleased to advise you.

## Adaptor hoods



### Specifications

- The M30 series hoods are offering enough space to integrate up to 4 D-Sub connectors
- Inotec is offering various variants with 1:1 pin-connection between one signal-in and multiple signal-out connectors

### Setup

- D-Sub IDC connectors according to customer definition
- Pin-to-pin connection with flat ribbon cable
- 4-40 UNC or M3 jackscrews
- Also available with clips for top-hat rail

## Intelligent interconnections



### Engineering, design and manufacture

The full metal design with labyrinth cover combined with the original Inotec crimp flange provide an exceptional level of shielding against HF interferences. Hence Inotec interconnectors are the perfect interface in sensitive networks with high data transfer rates.

Beside the classical BUS-connector solutions of the MSB and MSBS series, Inotec is also offering customized solutions with integrated PCB on the base of MS and DGA series hoods. By integrating e.g. non-volatile memories like EEPROMs, the connector may be programmed with an IP address or other functionalities.

## Individual housings



### Customized hood design

DGA series hoods may also be used as a housing for various applications. If required, Inotec is offering modified, machined geometries and provides complete sub-assemblies.

Our offer is completed by special accessories like e.g. crimp adaptors.

Due to their robustness, the full metal hoods allow the integration of other mechanical or electronical components like clips, switches, control-LEDs, sensors or antennas.



All dimensions on part drawings are indicated in mm.



## Technical information

Inotec regularly tests the shielding effectiveness of reference hoods according to DIN IEC 62153-4-5. The diagram below shows as example the value of shielding effectiveness of different hood types in comparison. As test specimens two connector hoods of the same type have been linked serving as coupling. All hoods have been equipped with identical connectors. The connection between the cable shield and the reference cable fol-

lowed the manufacturers' specifications. The test setup measures the emission levels of the test specimen by an absorbing clamp. The reference value of 0 dB is defined as the maximum emission level of an unshielded reference cable.

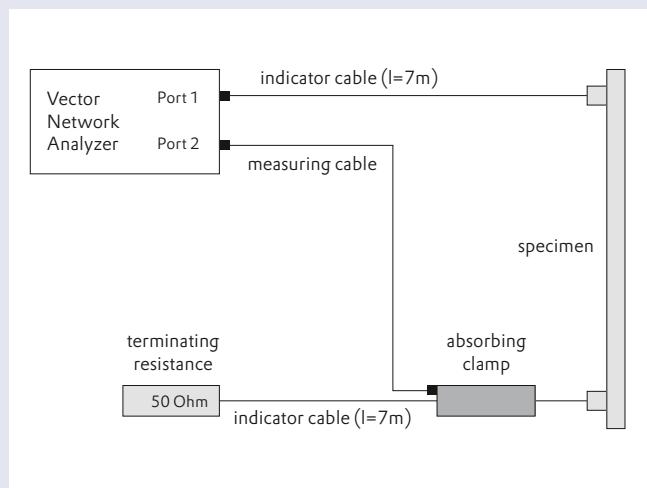
The curves of shielding effectiveness therefore represent the difference of the emission level compared to the unshielded cable.

### Comparative measurement on reference hoods

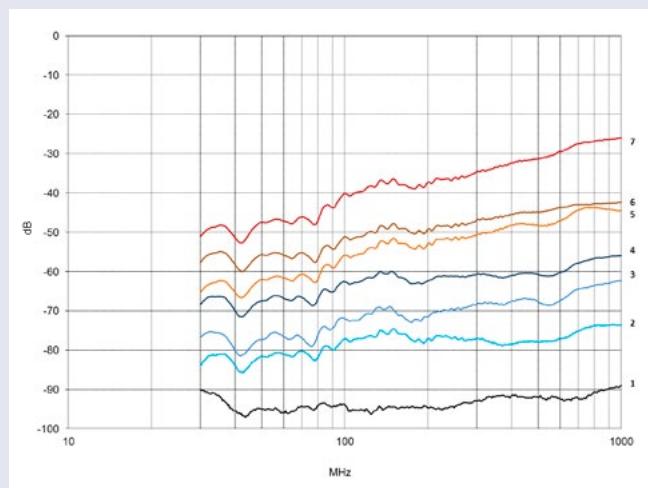
The shielded cable without connector shows the best shielding level. The comparative measurements of the connector couplings clearly reveal that full metal hoods generally achieve a higher shielding quality than plastic whereby metal-plated plastic hoods still show a lower shielding level than plastic hoods with metal inserts. Focusing the measurement results of the full metal hoods, the performance of the HF-protected Inotec hood

design combined with the Inotec crimp flange is superior to the measured benchmark hood. Furthermore, the additional effect of extended hood blankets becomes obvious in the results for Inotec MSX and MSBS series. Due to their close-up fitting to a mating connector, like in the test setup, or to a front panel like in most real applications, those hoods show a significant additional reduction of emissions.

### Test setup with absorbing clamp



### Shielding effectiveness according to DIN IEC 62153-4-5\*



- Line 1: Shielded cable without connector
- Line 2: Inotec DG09MSX
- Line 3: Inotec DG09MSBS
- Line 4: Inotec DG09MS
- Line 5: Full metal hood, benchmark
- Line 6: Plastic hood, metal coating
- Line 7: Plastic hood, metal inserts

\* Test method for metallic communication cables - Part 4-5:  
Electromagnetic compatibility (EMC) - coupling shielding or shielding effectiveness





## Coding system for D-Sub interfaces

### The solution to avoid wrong connections – secure, reliable and flexible

Highly sensitive measurement, control and communication devices require an efficient protection against accidental abusive mismatching. Visual instructions and colored labeling are not sufficient. Just a minimal contact, only for the fraction of a second, may cause a voltage flashover and damage the terminal device. Not only the risk of repair cost caused by such kind of incident but also the potential consequences like a system breakdown or e. g. an inoperative train may underline the

importance of a mechanical coding of critical interconnections as an indispensable safety factor. Having specialized in EMC interconnection solutions, Inotec electronics GmbH has developed a unique D-Sub coding system for hoods with screw locking. It does not only reliably avoid mismatching, it also improves the EMI / RFI shielding performance of the interface by providing a consistent full metal contact.

#### Secure

- Up to 70 coding versions offer protection against unintentional or abusive mating of connectors
- Full metal coding elements improve grounding contact for optimal EMC

#### Robust

- Coding elements are either riveted to the connector shell or screwed on the device
- High-end and precise full metal components

#### Reliable

- Accurate alignment with special positioning device
- Inserting the coding pins process-reliable thanks to a preset tool

#### Flexible

- Suitable for all codable Inotec D-Sub hoods
- Easy to process in workshop or field assembly
- Can be variably used with M3 or 4-40 UNC jackscrews

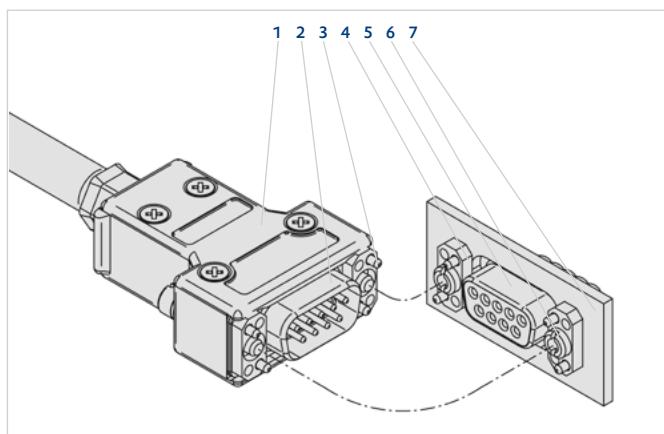




## Possible installation situations for the Inotec coding system

Basically, any D-Sub interface with screw locking can be coded with the Inotec system.

However, depending on the installation situation, a coordinated selection of components has to be made:

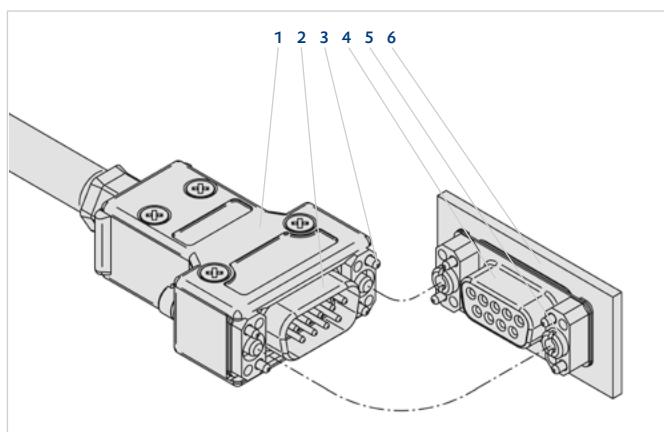


### Rear assembly

**Interconnection: Cable to terminal device**

**Connector in the terminal device situated behind the front panel  
(most common installation situation)**

1. Inotec connector hood with screw locking\*
2. Inotec connector xxx-KOD02
3. Inotec coding pins KOS-01
4. Inotec coding elements KOP-01  
(optionally KOR09 for 9-way D-Sub)
5. D-Sub connector (without coding elements)
6. Inotec female jackscrew KOB-x/x
7. Front panel of terminal device (Please consider wall thickness\*\*)

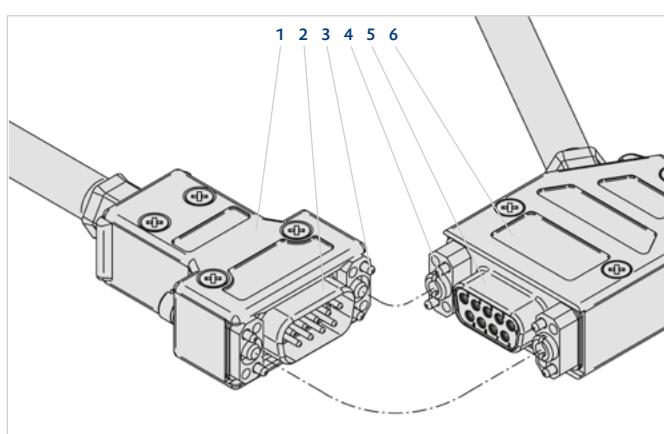


### Front assembly

**Interconnection: Cable to terminal device**

**Connector in the terminal device is mounted on top of the front panel (e.g. in case of difficult access inside the device)**

1. Inotec connector hood with screw locking\*
2. Inotec connector xxx-KOD02
3. Inotec coding pins KOS-01
4. Inotec connector xxx-KOD03
5. Inotec female jackscrew KOB-x/x
6. Front panel of terminal device  
(Please consider wall thickness\*\*\*)



### Coupling

**Interconnection: Cable to cable**

**Connector hood with screw locking against connector hood with female jackscrew**

1. Inotec connector hood with screw locking
2. Inotec connector xxx-KOD02
3. Inotec coding pins KOS-01
4. Inotec female jackscrew KOB-x/x
5. Inotec connector xxx-KOD03
6. Inotec connector hood with female thread\*

#### \* Which Inotec connector hoods are suitable for codable connectors?



The coding symbol provides a quick overview if the standard hood is already prepared for coding or if there are codable versions available or if the hood is not compatible with the coding system. You will find the corresponding item numbers in our **hood selector (pp. 76, 77)** or by contacting our technical support service: [info@inotec-electronics.com](mailto:info@inotec-electronics.com).

\*\* max. 2,8 mm when using KOP-01, max. 2,1 mm when using KOR09

\*\*\* max. 2,3 mm for front assembly (limited by length of female jackscrews)



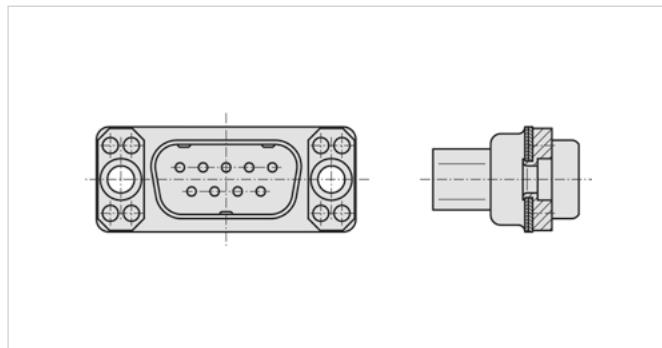


## Components and tools for cable- and device-side coding

The Inotec coding system is getting along with only a few components and tools for all D-Sub sizes. Especially field assembly is facilitated due to the coding elements being riveted directly onto the connector. On the device side Inotec provides alternative assembly options: 9-way D-Sub interconnections can be easily equipped with the one-piece coding frame. The standard coding

elements have to be mounted pairwise and are suitable for all D-Sub sizes. With the help of the Inotec positioning device, aligning the coding elements and tightening the jackscrew is easily done in a single operation. Depending on the required thread type on the device side, the jackscrews are available in M3, 4-40 UNC or a combination of both.

### D-Sub crimp-connectors KOD02



All Inotec hoods suitable for coding are indicated in the hood selector (pp. 76, 77)

#### Specifications

- Inotec D-Sub connector for crimp contacts\* with coding elements riveted on connector shell (protects coding elements from twisting)
- Standard version KOD02 for cable-side assembly in codable Inotec full metal hoods
- Special Inotec indent geometry of shell dimples for improved grounding contact
- Different numbers of poles or connector types (e.g. solder-cup, dip-solder or HD) are available on request)

#### Standard version

##### Pin

- 9-way DC09P-G-KOD02
- 15-way DC15P-G-KOD02
- 25-way DC25P-G-KOD02
- 37-way DC37P-G-KOD02

##### Art.-No.

##### Inotec- shell dimples

##### Art.-No.

##### Standard- shell dimples<sup>1)</sup>

- DC09P-G-KOD02
- DCE09P-G-KOD02
- DC15P-G-KOD02
- DCE15P-G-KOD02

##### Socket

- 9-way DC09S-G-KOD02
- 15-way DC15S-G-KOD02
- 25-way DC25S-G-KOD02
- 37-way DC37S-G-KOD02

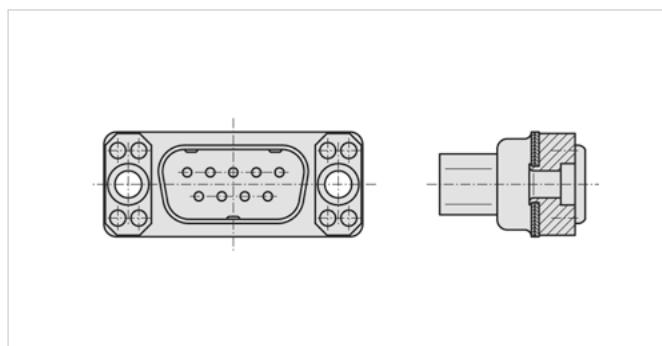
##### Inotec- shell dimples

##### No indent

- DC09S-KOD02
- DC15S-KOD02
- DC25S-KOD02
- DC37S-KOD02

<sup>1)</sup> Standard shell dimple geometry should only be combined with female connectors without indent

### D-Sub crimp-connectors KOD03



Only for front assembly and coupling, not appropriate for Inotec connector hoods with screw locking



#### Specifications

- Inotec D-Sub connector for crimp contacts\* with coding elements riveted on connector shell (protects coding elements from twisting)
- Special connector KOD03 with higher coding elements serves as counter-connector for couplings or in front assembly situations
- Special Inotec indent geometry of shell dimples for improved grounding contact
- Different numbers of poles or connector types (e.g. solder-cup, dip-solder or HD) are available on request)

#### Standard version

##### Pin

- 9-way DC09P-G-KOD03
- 15-way DC15P-G-KOD03
- 25-way DC25P-G-KOD03
- 37-way DC37P-G-KOD03

##### Art.-No.

##### Inotec- shell dimples

##### Art.-No.

##### Standard- shell dimples<sup>1)</sup>

- DC09P-G-KOD03
- DCE09P-G-KOD03
- DC15P-G-KOD03
- DCE15P-G-KOD03

##### Socket

- 9-way DC09S-G-KOD03
- 15-way DC15S-G-KOD03
- 25-way DC25S-G-KOD03
- 37-way DC37S-G-KOD03

##### Inotec- shell dimples

##### No indent

- DC09S-KOD03
- DC15S-KOD03
- DC25S-KOD03
- DC37S-KOD03

<sup>1)</sup> Standard shell dimple geometry should only be combined with female connectors without indent

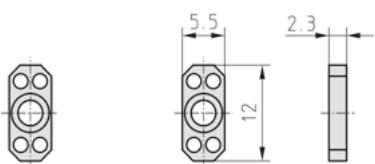


All dimensions on part drawings are indicated in mm.

\* For detail information about solder-cup, dip-solder or 90° solder contact versions as well as for HD connectors please contact our support under [info@inotec.electronics.com](mailto:info@inotec.electronics.com).



## Coding elements



For Inotec coding pins KOS-01



Only for use with Inotec female jackscrew KOB-x/x

### Specifications

- Conductive coding elements in die-cast zinc for the device-side coding of interconnections in rear panel installation
- For front panel thicknesses from 1,7 mm up to max. 2,8 mm

### Scope of supply

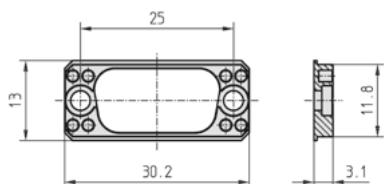
- 1 PU containing 100 pcs.

Art.-No.  
KOP-01

### Service instructions

- The assembly devices KOMxx (see below) facilitate the positioning, alignment and fixing of KOP-01

## Coding frame



For Inotec coding pins KOS-01



Only for use with Inotec female jackscrew KOB-x/x

### Specifications

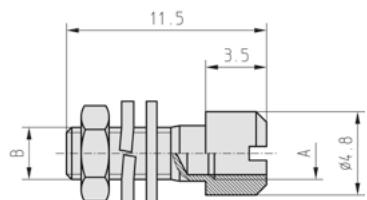
- Conductive coding frame in die-cast zinc for the device-side coding of 9-way D-Sub or HD15 interconnections in rear panel installation
- Easy assembly – no alignment necessary
- For front panel thicknesses from 1,0 mm up to max. 2,1 mm

### Scope of supply

- 1 pc. coding frame

Art.-No.  
KOR09

## Female jackscrew



Special types for front assembly or special installation situations available on request



Jackscrews without nuts and washers available on request

### Specifications

- Female jackscrews with male and female thread for mounting Inotec coding elements KOP-01 and KOR09
- High-performance brass alloy for maximum tensile strength

### Scope of supply

1 set containing 2 pcs. each of female jackscrews, spring washers, washers, hexagon nuts (wrench size 5,5 mm for M3 screws and 5,0 mm for 4-40 UNC)

#### Female thread A

- 4-40 UNC
- 4-40 UNC
- M3
- M3

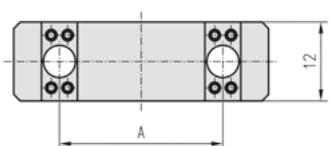
#### Male thread B

- 4-40 UNC
- M3
- 4-40 UNC
- M3

Art.-No.

KOB-4-40/4-40  
KOB-4-40/M3  
KOB-M3/4-40  
KOB-M3/M3

## Positioning device



For Inotec coding elements KOP-01



Designed for Inotec female jackscrews KOB-x/x

### Specifications

- Positioning jig for mounting the coding elements KOP-01 on mating side
- Easy fixing and alignment of the coding elements with female jackscrews on the front panel of the device
- The female jackscrews can be screwed through the positioning device

#### Hood size

- 9-way
- 15-way
- 25-way
- 37-way

#### Screw spacing A

- 25,0
- 33,3
- 47,0
- 63,5

Art.-No.

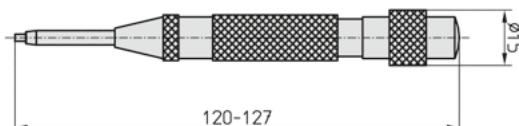
KOM09  
KOM15  
KOM25  
KOM37

All dimensions on part drawings are indicated in mm.





## Hand tool for coding pins



For Inotec D-Sub coding pins KOS-01

### Specifications

- Especially designed for inserting the coding pins KOS-01 in Inotec coding elements
- The internal spring mechanism produces exactly the necessary impulse for inserting the coding pins and therefore allows a process-reliable and reproducible coding

### Art.-No.

KOD101

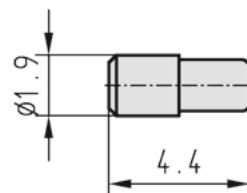
### Scope of supply

- 1 handtool for coding pins

### Service instructions

- Please follow the assembly instructions given below
- The tool is delivered with a factory-made presetting of the spring tension
- In cases of damage or malfunction, the tool should be returned to Inotec for inspection and repair

## Coding pins



For Inotec D-Sub coding elements KOP-01 and KOR09

### Specifications

- Coding pins to be inserted in Inotec coding elements KOP-01, coding frame KOR09 or all codable Inotec connectors with coding elements riveted on
- Material CuNi-Zn

### Art.-No.

KOS-01

### Scope of supply

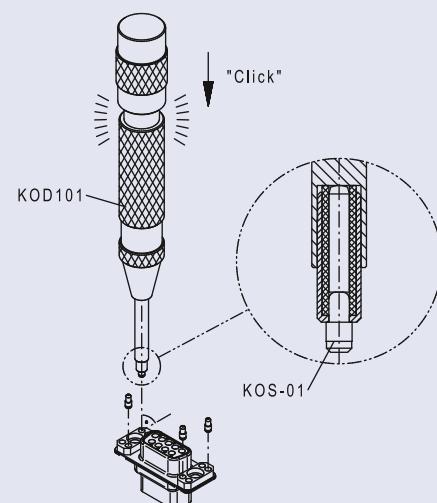
- 1 PU containing 100 pcs. of coding pins

### Service instructions

- To be mounted exclusively with Inotec hand tool KOD101

## Assembly Instructions

- Please make sure that the connector is placed on a firm support.
- Insert the coding pin KOS-01 into the tip of the hand tool like shown in the adjoining picture.
- Hand tool with pin must be placed vertically above the selected plug-in position.
- Push down the tool against the spring resistance until the punching mechanism releases and the impact drives the pin into the plug-in hole.

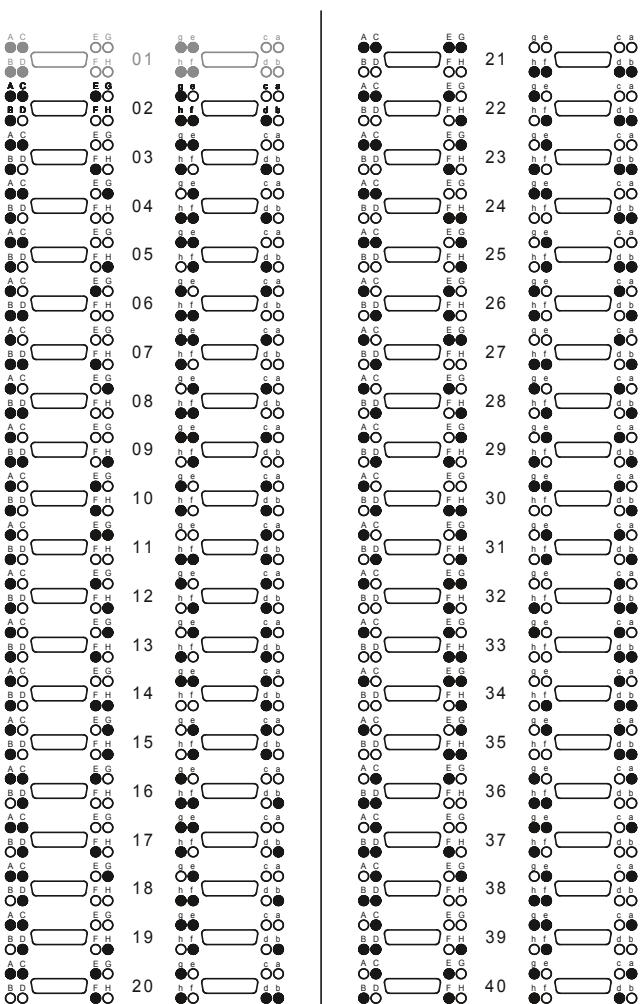


All dimensions on part drawings are indicated in mm.



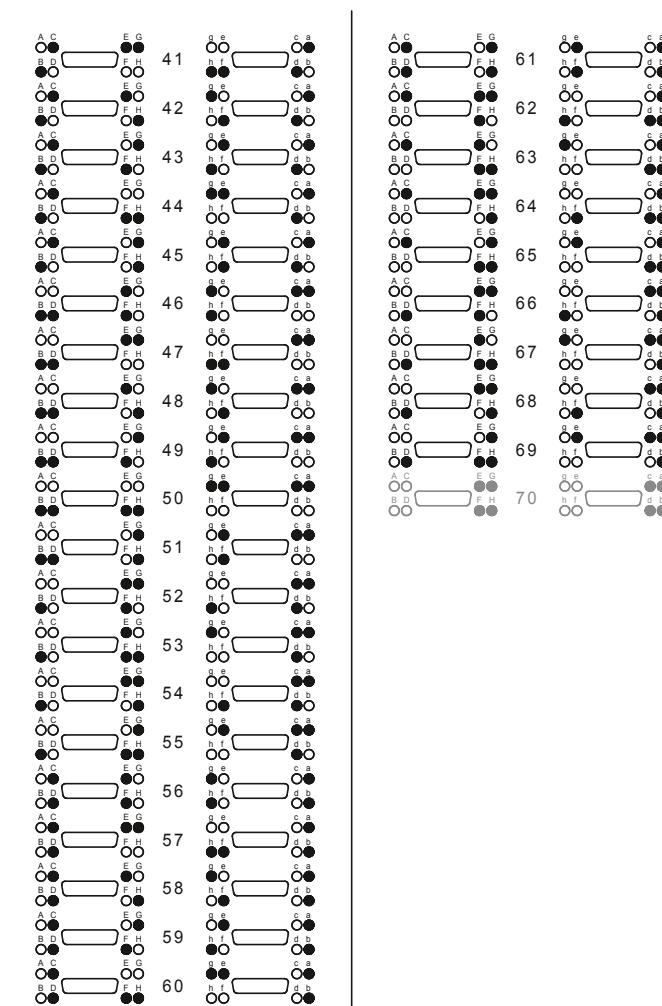
## How to apply the Inotec coding scheme

The Inotec coding scheme provides the maximum number of combinations for a safe protection of D-Sub interconnections against mismatching. By using at least 4 pins each on cable and mating side, an unintended contact of mismatched connectors can be securely avoided. In the following illustration you can see all 70 possible pin combinations for a safe and reliable coding of your D-Sub interconnection.



### Here's how the selection of a coding scheme is done:

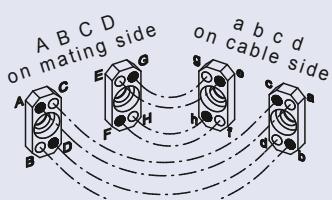
- In a first step a basic rule has to be set up (e.g. "ABCD always on female and abcd always on male connector").
- Then a specific combination for a specific interface (e.g. "scheme 29 for signal 1") has to be chosen
- Finally insert the coding pins into the corresponding coding elements according to the processing information mentioned below.



## Processing information

### Unambiguous documentation

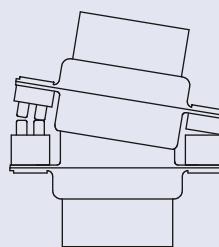
The chosen coding scheme and the combination should be unambiguously recorded, so that a correct coding can be carried out safely even when the connectors on mating side and cable side are assembled at different sites.



### Single-sided coding

Under unfavorable conditions, a coding with pins only on one connector side might lead to unintended contacting (connector may tilt like shown on picture below) despite a correct coding.

For this reason, a simultaneous use of the coding schemes "1" and "70" should be avoided.



# D-Sub connectors and contacts

Inotec's ambition is to ensure a maximum shielding performance, robustness and reliability for D-Sub interconnections. As crimping of D-Sub contacts is still the most reliable technology regarding safe assembly and contacting quality, Inotec has developed its own program of high-end D-Sub crimp connectors and contacts.

Our high-precision turned contacts made of special copper alloys are finished with premium quality gold plating on a nickel base layer. The dimensionally accurate and reliable manufacturing process com-

bined with a 1,3 µm gold layer in class 1 quality permits minimal contact resistances of less than 3 mΩ. The trapezoidal shaped collar of our connector shells is shielding the contacts against disturbances through electromagnetic fields. In order to optimize the grounding contact of the shells, Inotec provides an alternative type with indents on male and female connector shell.

As a matter of course, in addition to the classical crimp connectors, Inotec also offers premium connectors as solder-cup, dip-solder or other versions.

## High-end crimp connectors

- Developed according to IEC 60603-2 (DIN41652) and MIL-C-24308
- High-precision turned crimp contacts
- Quality class GK1 with 1,3 µm premium gold plating
- Contact resistance < 3 mΩ
- 2 possible combinations of connector shell dimples for optimal grounding contact
- Compatible with all standard-compliant D-Sub connectors

## Solder cup, dip-solder and special connectors

- Available in different quality classes
- With Inotec coding system on request

## Technical data

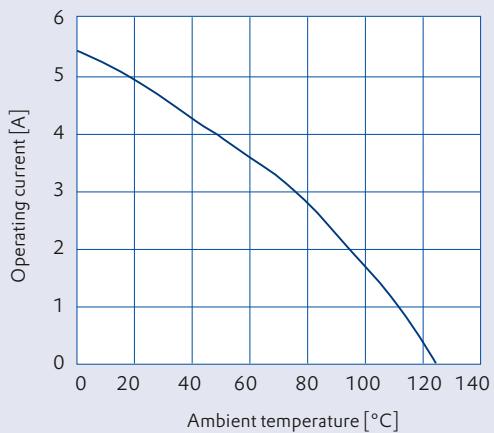
Number of poles available	9, 15, 25, 37, 50
Nominal current	5 Amp. <sup>1)</sup>
Operating Voltage	125V according to VDE 0110 Gr.A
Volume resistance	≤ 3 mΩ
Test voltage	1000 V, eff.
Clearance and creepage distance	≥ 1 mm
Insulating resistance	≥ 10 <sup>11</sup> Ω
Temperature range	-55°C to +125°C
Mating cycles	≥ 500 / 200 / 50 <sup>2)</sup>
Insulator	PBTP, 2-part design
Inflammability	self-extinguishing according to UL 94 V-0
Shell	Steel, plating Sn over Ni
Contacts	high-precision turning part, Cu-alloy
Plating	Au over Ni

1) According to adjacent current load diagram

2) According to DIN 41 652 quality classes

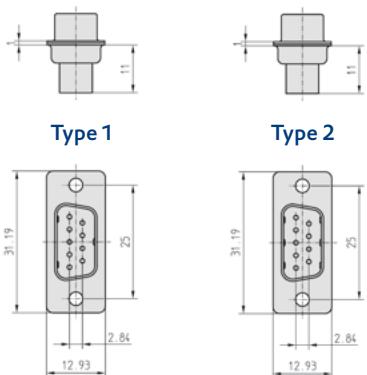
3) Values determined for solder-cup connectors. Values for different contact types may vary

## Current load diagram<sup>3)</sup>



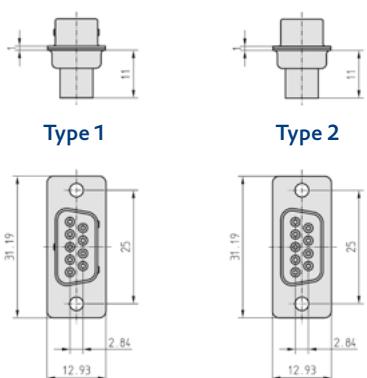


## Crimp connector pin



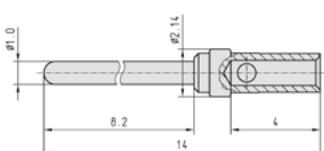
see chapter about coding system for D-Sub interfaces

## Crimp connector socket



see chapter about coding system for D-Sub interfaces

## Crimp contacts, pin



### Specifications

- Unequipped male connector for D-Sub crimp contacts
- Inotec connector shell dimples for improved grounding contact
- Alternatively with standard connector shell dimples (socket with plain metal collar)

### Standard version

Standard version	Art.-No.
Inotec-shell dimples	
■ 9-way	DC09P-G
■ 15-way	DC15P-G
■ 25-way	DC25P-G
■ 37-way	DC37P-G
■ 50-way	DC50P-G

Art.-No.
Standard shell dimples <sup>1)</sup>
DCE09P-G
DCE15P-G

<sup>1)</sup> Standard connector shell dimples only for female connectors with plain metal collar

### Specifications

- Unequipped female connector for D-Sub crimp contacts
- Inotec connector shell dimples for improved grounding contact
- Alternatively with standard connector shell dimples (socket with plain metal collar)

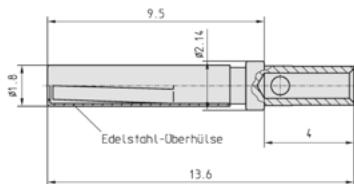
### Standard version

Standard version	Art.-No.	Art.-No.
Inotec-shell dimples		No indent
■ 9-way	DC09S-G	DC09S
■ 15-way	DC15S-G	DC15S
■ 25-way	DC25S-G	DC25S
■ 37-way	DC37S-G	DC37S
■ 50-way	DC50S-G	DC50S

All dimensions on part drawings are indicated in mm.



## Crimp contacts, socket



### Specifications

- Socket contact, high-precision turned
- Made of spring hardened Cu-bronze with stainless steel cover ferrule for protecting the contact section
- Crimp section annealed
- 1,3 µm premium gold plating for quality class 1

### Standard versions

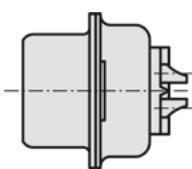
- Crimp contact, socket for AWG 24-20
- Crimp contact, socket for AWG 18 (up to max. 0,75 mm<sup>2</sup>)

Art.-No.

DCC2S4

DCC2S5

## Solder-cup connector



### Specifications

- Connector with solder cup according to DIN 41 652
- Turned precision contacts for secure contacting and long durability
- Quality class 1 gold plating for > 500 mating cycles
- Metal protection collar with high-premium nickel-plated tin coating for optimal grounding contact
- All variants are available with and without connector shell dimples

### Available versions

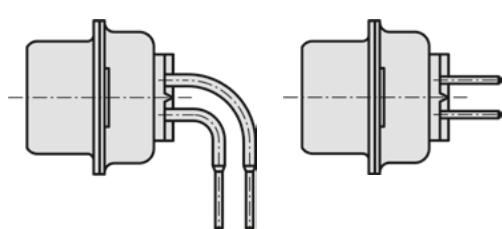
- From D-Sub 09 to 50-way, pin or socket
- With or without connector shell dimples

Item numbers on request



Variants with Inotec coding system on request

## Dip-solder connector



### Specifications

- Dip-solder connector with straight or 90 contacts according to DIN 41 652
- Turned precision contacts for secure contacting and long durability
- Quality class 1 gold plating for > 500 mating cycles
- Metal protection collar with high-premium nickel-plated tin coating for optimal grounding contact
- All variants are available with and without connector shell dimples

### Available versions

- From D-Sub 09 to 37-way, pin or socket
- With or without connector shell dimples
- Optionally available with 90° PCB mount brackets in diecast zinc and 4-40 UNC or M3 thread

Item numbers on request



Variants with Inotec coding system on request



All dimensions on part drawings are indicated in mm.

A large, empty grid area for writing notes, consisting of a 20x20 grid of light gray squares.

# IEC 60603-2 (DIN 41612) connector systems



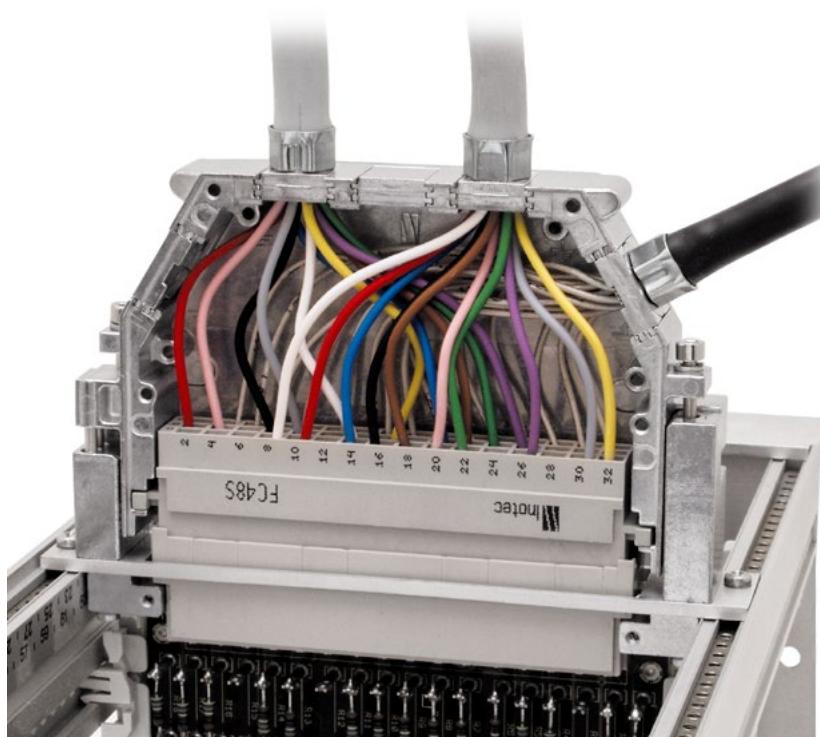


## EMC-compliant and robust hood systems for 19" racks

No matter if telecommunication equipment, industrial process control or network setups are concerned – 19" racks with IEC 60603-2 (DIN 41612) interfaces are still essential for various electronic systems. Focusing on EMC, robustness and easy assembly, Inotec has developed two complete hood systems including the required connecting elements which are able to cover all common assembly situations: While the MSF-1 / -3 hood system is a classical solution for a direct PCB assembly, the MSF-91 / -92 allows a se-

parate installation of the interface on end device (including PCB) and cable side. Due to its full metal mounting brackets the MSF-91/92 system offers a robust and reliable connection with a low-resistance grounding contact between the connector hood and the 19" front panel.

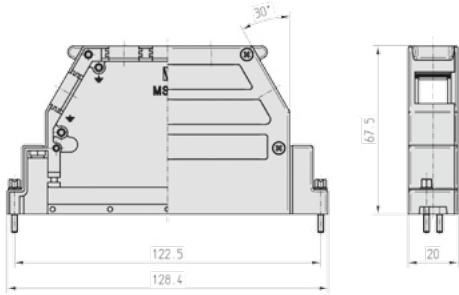
For optimal HF-protection, high traction relief and efficient processing, the MSF hoods should be used in combination with Inotec crimp flange technology.



### A complete interface solution:

- EMC-compliant hood design
- HF-protected full metal hoods made of die-cast zinc with labyrinth cover
- Unused cable entries are sealed against HF interferences with blind plugs
- Integrated grounding points
- Ergonomic hood design (avoids pulling on the cable)
- Inotec crimp flange technology with dovetail design ensures minimum transition resistances
- Cable clamps in 4 different standard sizes for routing cable or wire bundles
- 3+2 cable entries offer a large variety of cabling options
- Premium and durable fixing elements for reliable long-run installations
- F-Type 48-way socket connector for crimp contacts, fire and smoke resistance for railway vehicles according NFF 16-101 / NFF 16-102, classification I2/F1 (Rolling Stock category A1)

**DG48MSF-1 / DG48MSF-3**



**Specifications**

- Full metal hood for direct PCB assembly on 4 HP plug-in units in 19" racks
- Spacers for assembly with socket connectors type E,F or H
- Integrated coding system

**Options**

- DG48MSF-1 long cover for plug-in systems with separated grounding contacts on the front panel
- DG48MSF-3 short cover for plug-in systems with flat front panel

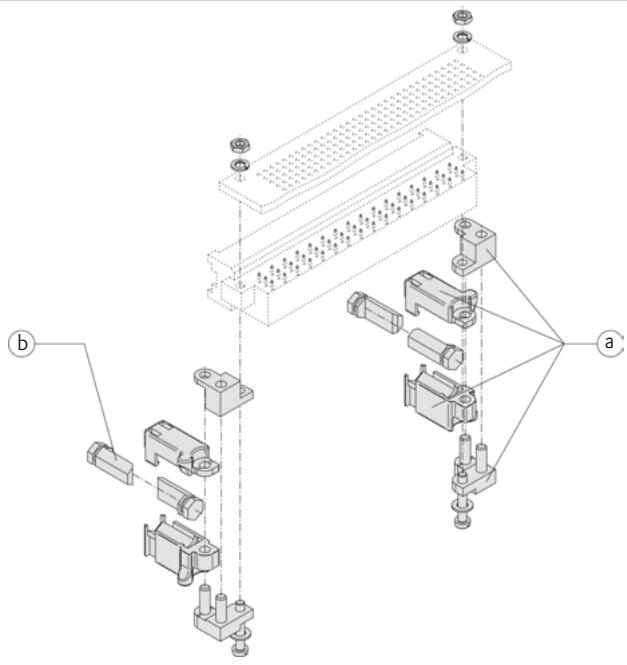
**Scope of supply**

- 1 full metal hood with cover
- 2 hexagon head screws M2,5x18 with spring washers (mounted with anti-loss indent)
- 2 grounding screws M2,5x4,5\*
- 4 cover screws M2,5x7\*

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

**PCB mounting set**



**Specifications**

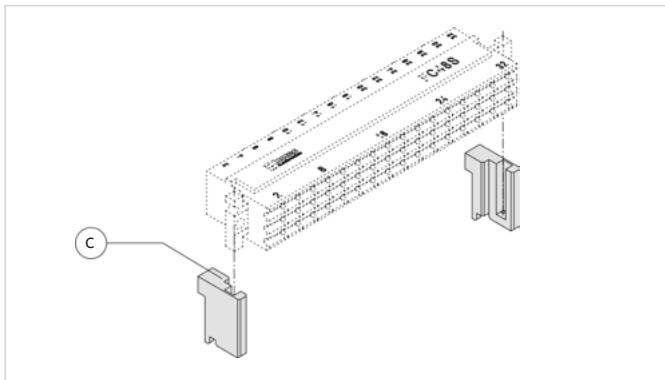
- Mounting set and coding elements for direct assembly on 19" PCBs. After attaching the mounting set on the PCB, the connector hood can be plugged directly on the mounting set. The interface can be coded with 4 coding elements. 2 coding elements are placed in the mounting set while the counterparts have to be positioned in the connector hood.

**Scope of supply**

- 1 PCB mounting set (a)
- 1 set of coding elements containing 4 pcs. (b)

**Art.-No.**  
LPH-1  
KOE-1

**Spacer set**



**Specifications**

- Spacers for connectors with hood size E, F or H according to DIN 41612

**Scope of supply**

- 1 set of spacers for hood size E
- 1 set of spacers for hood size F or H

**Art.-No.**  
DTE-1  
DTF-1

(c) Illustration shows DTF-1



All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.

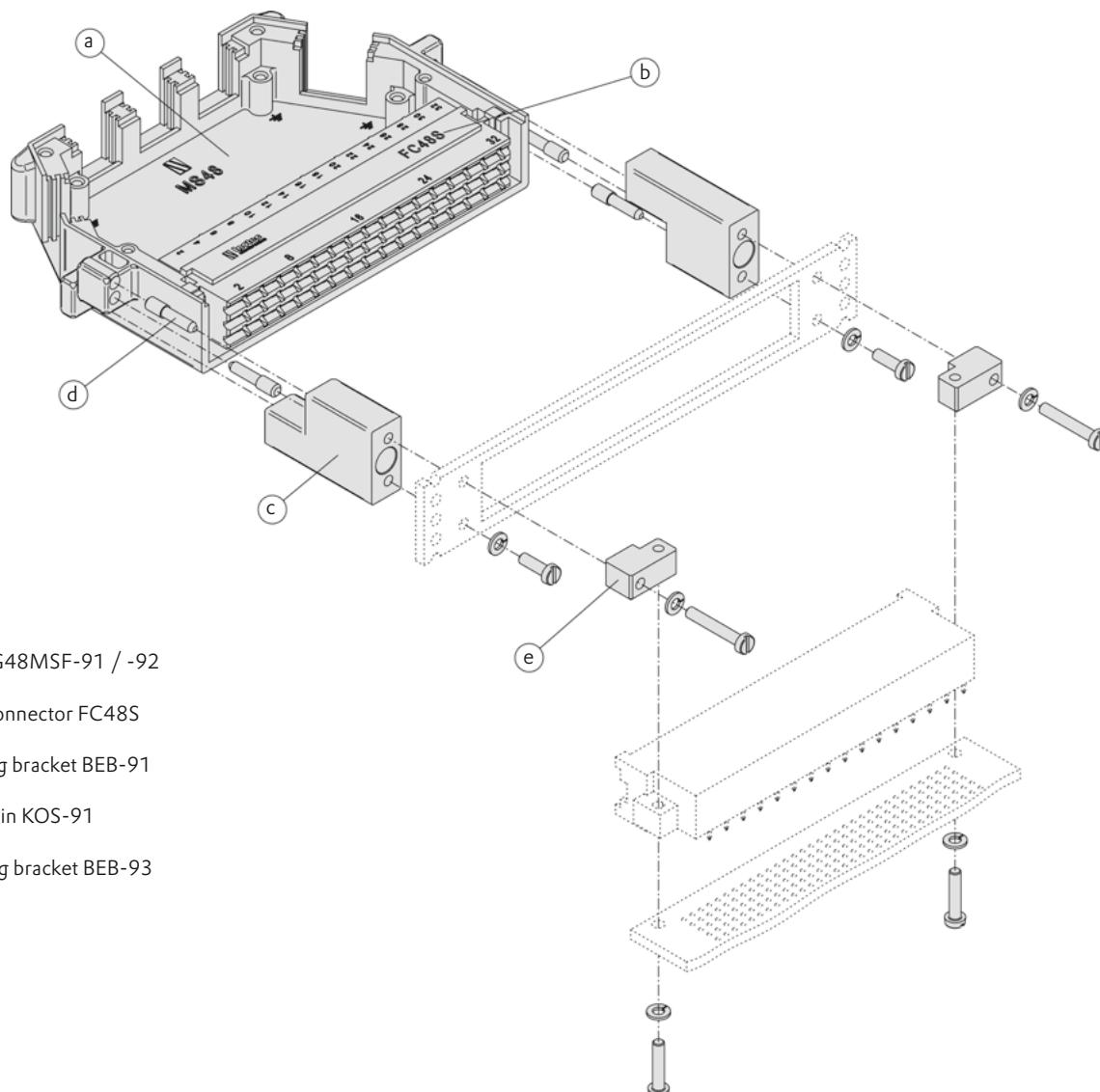
**Robust and compact, easy-to-handle and reliable**

Especially designed for closed industrial 19" racks like being used e.g. in control units for power converters or also in communication systems, Inotec has created an interconnection system permitting a separate assembly of the connector on cable side and the mating-side interface.

The entire IEC 60603-2 (DIN 41612) connector system consists of a full metal hood with cable entries for Inotec crimp flange technology, the corresponding F-type, 48-way socket connector, gold plated precision contacts and separate mounting brackets serving as interface on the 19" rack.

Inotec has designed this interface with focus on EMC, robustness, easy assembly and disassembly. The hood is optionally available as E-Type version receiving E-Type multipoint socket connectors.

A continuous metallic interface through all connecting elements ensures an optimal grounding contact as well as a vibration-resistant and safe fixation. For improved application security, connector and mounting brackets provide four locating holes for coding pins.



(a) Hood DG48MSF-91 / -92

(b) Socket connector FC48S

(c) Mounting bracket BEB-91

(d) Coding pin KOS-91

(e) Mounting bracket BEB-93

**Screw options****DG48MSF-92**

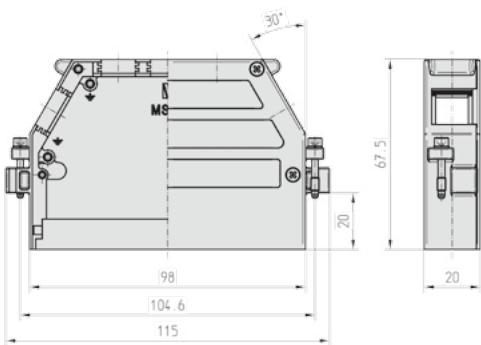
Locking screw with a piloting tip facilitates assembly in unfavourable installation situations

**DG48MSF-91**

Standard locking screw



**DG48MSF-91 / DG48MSF-92**



Standard locking screw DG48MSF-91  
Locking screw with piloting tip DG48MSF-92

**Specifications**

- Connector hood for IEC 60603-2 (DIN 41612) F-type socket connectors
- For front panel mounting on 19" racks with 4 HP plug-in units
- Compact system width of 115 mm for limited installation spaces
- Minimum clearance, robust and reliably vibration-resistant connection in combination with separate screw-on mounting brackets
- Flexible coding with metallic coding pins in 4 plug-in positions

**Scope of supply**

- Full metal hood and cover incl. 2 pcs. locking screws, mounted with spring washer and anti-loss indent
- 2 pcs. grounding screws M2,5x4,5\*
- 4 pcs. cover screws M2,5x7\*

**Spare part Art.-No.**

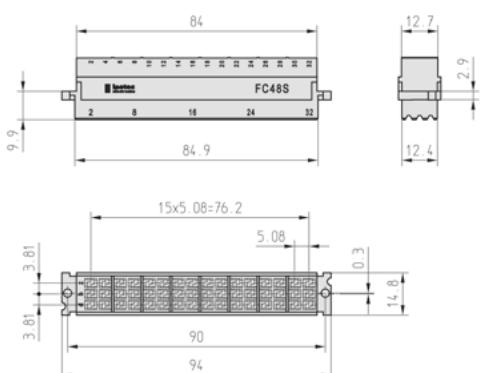
DZ-ES1  
DZ-SS1

**Option**

- Modified hood for Type E connectors  
(Data sheet available on request)

DG48MSE-91

**F-type socket connector**



**Specifications**

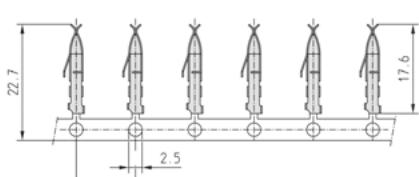
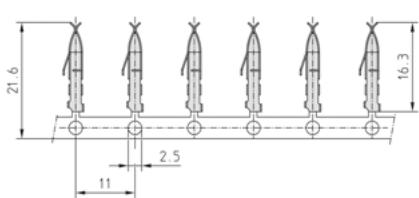
- IEC 60603-2 (DIN 41612) socket connector
- Insulator for 48 crimp contacts FCCxS-200
- Complies with the fire safety requirements according to NF F 16 101/102

**Scope of supply**

- 1 pc. insulator

**Art.-No.**  
FC48S

**Spring contacts (ribbon)**



**Specifications**

- Crimp spring-contacts, stamped, partially gold plated

**Art.-No.**

FCC1S-200

**Scope of supply**

- 1 ribbon of spring contacts  
Wire cross section 0,14 - 0,5 mm<sup>2</sup>  
Outer cable Ø (jacket) 1,0 - 2,0 mm
- 1 ribbon of spring contacts  
Wire cross section 0,5 - 1,5 mm<sup>2</sup>  
Outer cable Ø (jacket) 1,8 - 2,8 mm

FCC2S-200

1 ribbon = 2.500 contacts

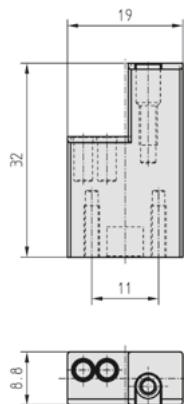
Class 2 quality



All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.

## Mounting bracket for front panel mounting



### Specifications

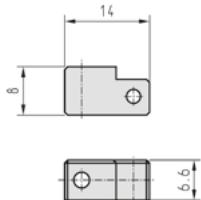
- Mounting bracket for DG48MSF-91 / -92 with clearance holes for coding pins
- Mounting clearance holes M2,5 for fixing the front panel

### Scope of supply

- 2 pcs. mounting brackets

Art.-No.  
BEB-91

## Mounting bracket for PCB



### Specifications

- Mounting bracket for rear panel assembly of spring bars DIN 41612 F-type PCB included
- The mounting bracket simultaneously serves as mating part for front panel assembly of the mounting bracket BEB-91
- Fixing screws for front panel assembly of BEB-91 included

### Scope of supply

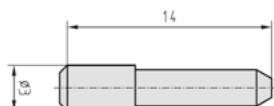
Complete set contains

- 2 pcs. mounting brackets
- 2 pcs. screws M2,5x8\*
- 2 pcs. screws M2,5x12\*
- 2 pcs. screws M2,5x16\*
- 6 pcs. spring washers

Art.-No.  
BEB-93

Only available as complete set

## Coding pins



### Specifications

- Coding pin for connector hood DG48MSF-91 / -92 in combination with mounting brackets BEB-91

### Scope of supply

- 1 pc. coding pin

Art.-No.  
KOS-91

### Hand tool

- 1 pc. hand tool for coding pins  
Design similar to hand tool for D-Sub coding system (page 40)

Art.-No.  
KOD148

All dimensions on part drawings are indicated in mm.

\* Recommended fastening torque 0,4 Nm.



# Circular connectors





## M12 connector system MSR12/MRR12

With the MSR12 / MRR12 series Inotec electronics has developed a circular connector system according to DIN IEC 61076-2-101. Due to its special full metal hood the system takes account of the users' demand for a maximum EMI / RFI shielded data transmission combined with a robust and reliable connection. Further characteristics are the compact and space-saving design as well as easy assembly and mounting. The system is designed for an extended temperature range from -55°C to +150°C and therefore also complies with the high fire and smoke requirements of the railway industry. High-end gold-plated special contacts reliably ensure minimum transition resistances for high mating frequencies of >500 cycles.

Due to the precision turned crimp contacts, not only low contact resistances but also an optimal connection to the cable core is ensured. Representing an alter-

native to overmolded M12 connectors, the MSR12 / MRR12 series is focusing applications requiring field assembly or individual wirings. The original Inotec crimp flange technology provides a 360° contact to the cable shield and ensures an optimal traction relief of the cable without exerting pressure on the cable cores. The components are especially adapted for the applied cable. Main area of application for MSR12 / MRR12 series is a transmission of sensitive low-voltage signal or data through shielded cables. In particular these are Industrial Ethernet and fieldbus applications like e.g. Profibus, Profinet, Ethernet/IP, Sercon, CAN Bus and further protocols being applied e.g. for data transmission in the railway industry.

These applications do require a high level of shielding against disturbances, like e.g. in control- and supervising networks or

passenger information systems. Another crucial factor in this kind of networks is their mechanical robustness. Traction and torque relief for data or signal transmitting wires when cables are bended or pulled are as important as a vibration resistant interconnection to the terminal device.

While many conventional Ethernet connectors like e.g. the widely-used RJ45 plug are not suitable for this kind of mechanical load cases, the D-coded M12 series represents the optimal standard solution.

As an option, Inotec also offers a 4-way A-coded interface. Further variants or designs may be developed according to customer demands.

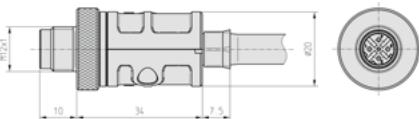


### Inotec M12 connector system for field assembly:

- Maximum EMI/RFI shielding provided by full-metal housing combined with Inotec crimp flange technology
- 360° cable shield contact, extreme traction and torque resistance without compressing the cable core
- Compact and space-saving design in straight or 90° version
- Robust and vibration resistant

## Housings suitable for Inotec crimp flange technology

### MSR12-P-4D



 4-way A-coding: MSR12-P-4A  
Further types available on request

#### Specifications

- D-coded Crimp connector for field assembly
- Shielding threaded sleeve for male insulator, rotating M12x1
- Symmetric full metal half shell housing with labyrinth flanges, straight cable entry
- 360° cable shield contact with Inotec crimp flange technology CF100 / CF300

#### Scope of supply

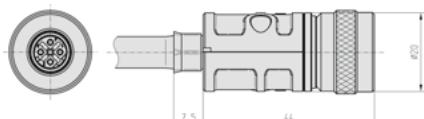
- 1 pc. threaded sleeve M12x1
- 2 pcs. half shells, die-cast zinc 0°
- 1 pc. grounding screw\*
- 2 pcs. cover screws\*
- 1 pc. D-coded male insulator
- 4 pcs. crimp contacts, class 1, pin

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

M12CP-4D  
MCC3P4

### MSR12-S-4D



 4-way A-coding: MSR12-S-4A  
Further types available on request

#### Specifications

- D-coded Crimp connector for field assembly
- Shielding threaded sleeve for female insulator, fixed M12x1
- Symmetric full metal half shell housing with labyrinth flanges, straight cable entry
- 360° cable shield contact with Inotec crimp flange technology CF100 / CF300

#### Scope of supply

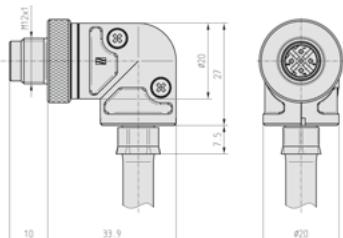
- 1 pc. female threaded sleeve M12x1
- 2 pcs. half shells, die-cast zinc 0°
- 1 pc. grounding screw\*
- 2 pcs. cover screws\*
- 1 pc. D-coded female insulator
- 4 pcs. crimp contacts, class 1, pin

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

M12CS-4D  
MCC3S4

### MRR12-P-4D



 4-way A-coding: MRR12-P-4A  
Further types available on request

#### Specifications

- D-coded Crimp connector for field assembly
- Shielding threaded sleeve for male insulator, rotating M12x1
- Asymmetric full metal half shell housing with labyrinth flanges, 90° cable entry
- 360° cable shield contact with Inotec crimp flange technology CF100 / CF300

#### Scope of supply

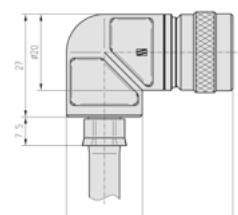
- 1 pc. threaded sleeve M12x1
- 1 pc. upper half shell 90°, die-cast zinc
- 1 pc. lower half shell 90°, die-cast zinc
- 1 pc. grounding screw\*
- 2 pcs. cover screws\*
- 1 pc. D-coded male insulator
- 4 pcs. crimp contacts, class 1, pin

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

M12CP-4D  
MCC3P4

### MRR12-S-4D



 4-way A-coding: MRR12-S-4A  
Further types available on request

#### Specifications

- D-coded Crimp connector for field assembly
- Shielding threaded sleeve for female insulator, fixed M12x1
- Asymmetric full metal half shell housing with labyrinth flanges, 90° cable entry
- 360° cable shield contact with Inotec crimp flange technology CF100 / CF300

#### Scope of supply

- 1 pc. female threaded sleeve M12x1
- 1 pc. upper half shell 90°, die-cast zinc
- 1 pc. lower half shell 90°, die-cast zinc
- 1 pc. grounding screw\*
- 2 pcs. cover screws\*
- 1 pc. D-coded female insulator
- 4 pcs. crimp contacts, class 1, pin

**Spare part Art.-No.**

DZ-ES1  
DZ-SS1

M12CS-4D  
MCC3S4

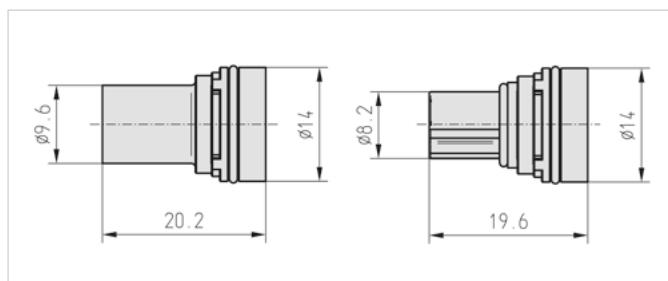
 All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



## Insulator bodies and contacts

### Insulator bodies



#### Specifications

- Glass fibre reinforced thermoplastics, self-extinguishing according to UL 94-V-0 and qualified according to fire and smoke standard NF F 16-101 / NF F 16-102, category I2/F1

#### Scope of supply

- 1 pc. insulator pin
- 1 pc. insulator socket

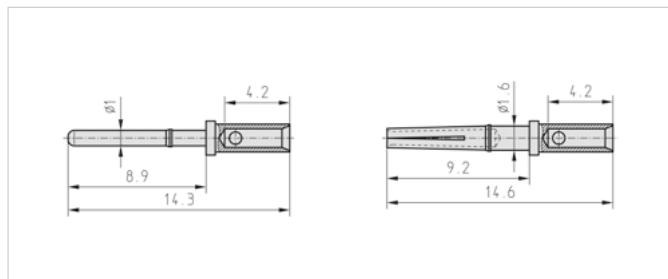
#### Spare part Art.-No.

M12CP-4D  
M12CS-4D



4-way A-coding: M12CP-4A, M12CS-4A

### Crimp contacts



#### Specifications

- Precision turned crimp contacts for Inotec M12 insulator bodies
- Cu alloy, Au over Ni plating
- Wire cross section 0,35 - 0,75 mm<sup>2</sup>

#### Scope of supply

- 1 pc. crimp contact pin
- 1 pc. crimp contact socket

#### Spare part Art.-No.

MCC3P4  
MCC3S4



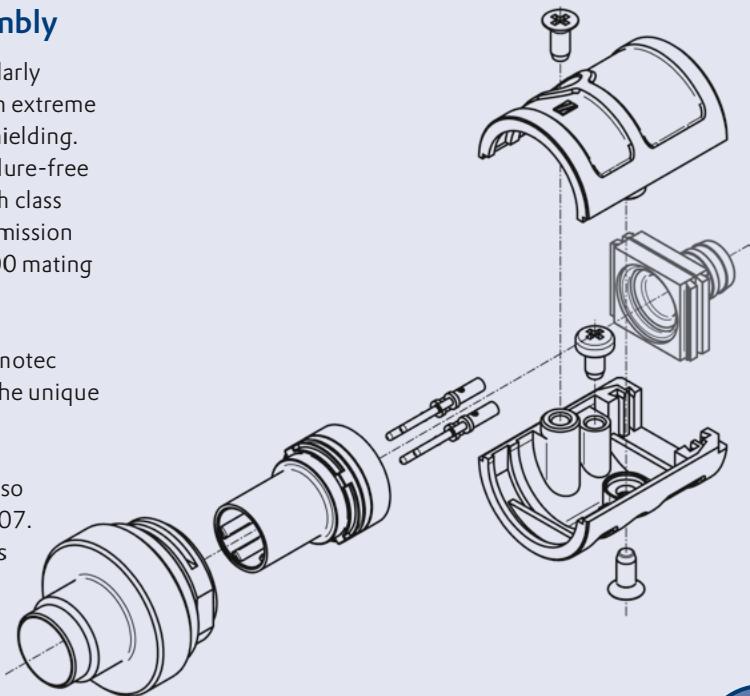
also compatible with 4-way A-coding

## Secure, robust and reliable – M12 connector system for field assembly

The Inotec M12 connector system has been particularly designed for field assembly of interconnections with extreme requirements for robustness and electromagnetic shielding. The elementary setup of the housing facilitates a failure-free assembly. High-precision turned crimp contacts with class 1 quality gold plating do provide a secure data transmission and low contact resistances even after more than 500 mating cycles.

Being the first circular connector using the original Inotec crimp flange technology, the system benefits from the unique 360° shield contact and traction relief.

For prototype or special wirings, the housing may also be used with Inotec cable clamps DKS100 or DKS107. You may find details about Inotec crimp components on pages 62 ff.



All dimensions on part drawings are indicated in mm.



## Tools and technical information

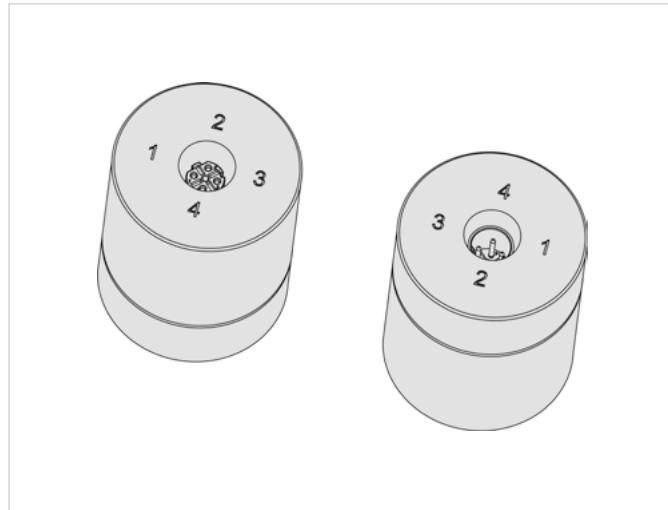
Field assembly of circular connectors does require a distinct and reliable assignment between cable wires and plug-in positions. Colored markings may facilitate the identification but they do not provide a reliable orientation as wire colors may vary.

The Inotec assembly device does not only simplify inserting the contacts into the insulator body. With its D-coded interface and well legible numbering of the contact positions it also allows the definition of a cable-specific assembly scheme.

The insertion of the contacts may be realized with the help of a standard D-Sub contact insertion tool (see chapter "tools" page 69 ff.).

The 360°shield contact by the original Inotec crimp flange technology and the patented double-dovetail geometry provide a minimum attenuation level for the complete interface. The screening attenuation diagram below shows the frequency-related levels of attenuation for a male/female coupling with straight, D-coded M12 connectors (MSR12-P-4D and MSR12-S-4D).

## Assembly device M12



### Specifications

- Assembly device to facilitate the insertion of Inotec male/female M12 contacts
- Well legible numbering of the contact positions
- Demountable
- Optional setup for 4-way A-coded connectors on demand

### Scope of supply

- 1 pc. assembly device

Art.-No.  
M12-M01

Completely assembled including the counter-connectors for the required coding (D-coding as standard setup).

### Technical information

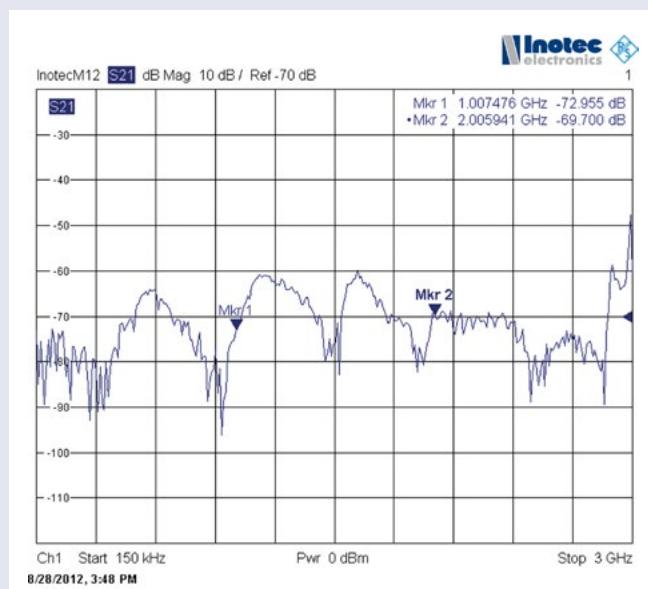
Temperature range	-55 to +150°C
Coding (No. of contacts)	D (4)
- available on request	A (4-5)
Wire cross section	0,35 - 0,75 mm <sup>2</sup>
Rated voltage*	250 V AC/DC
Testing voltage*	2500 V AC
Clearance and creep distances	≥1 mm
Insulation resistance	≥10 <sup>11</sup> Ω
Contact resistance	≤ 3 mΩ
Number of mating cycles	>500
Recommended torque	0,6 Nm

\* Tested on D-coding insulator body (4-way)

### Please note

Inotec M12 crimp contacts may only be used for Inotec M12 system. They are not compatible with Inotec D-Sub insulator bodies.

### Screening attenuation





## Customized solutions with crimp flange technology

The original crimp flange technology developed by Inotec with its unique 360° shield contact may also be integrated in other standardized circular connector systems. Especially in military applications, connectors have to fulfill extreme requirements in terms of EMC, robustness and reliability. For this reason, Inotec is offering special crimp flange adaptor parts for MIL-standard connectors. Due to their particular design with a sealing flange for shrink tubes they even allow an IP67 sealing of the crimped area.

Interconnection design for machine tools, apparatus constructions and also for plant engineering often requires complex

configurations in low quantities. For this reason, devices are often connected by a direct cable feedthrough instead of plug-in connectors. Especially for this kind of application, Inotec has combined the crimp flange technology with the principle of single-piece cable gland. Available in wrench sizes starting with M8, these components provide an extremely robust feedthrough with a high level of shielding and an optional IP67 sealing with an additional shrink tube.

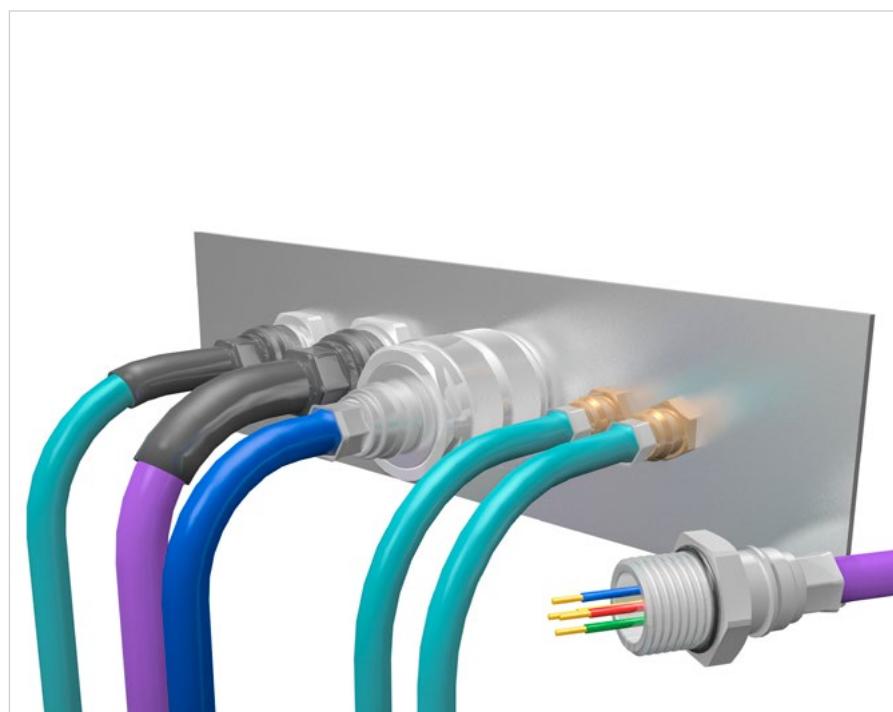
All adaptors are produced according to the cable-specific crimp definition and may be customized for special applications.

### Adaptors for MIL-standard circular connectors

- Standardized adaptor for MIL-C-38999
- Sealing flange for shrink tubes allows IP67 assemblies
- Various adaptors for further MIL and other circular connector standards available on demand

### Cable feedthrough with integrated crimp flange

- Compact design for high packing density
- Sealing ring and sealing flange for shrink tubes allows IP67 assemblies
- Customized design
- Advantages of the original crimp flange technology
  - 360° shield contact
  - High traction, torque and vibration resistance
  - No compression of cable wires
  - Fast, reliable and repeatable assembly process

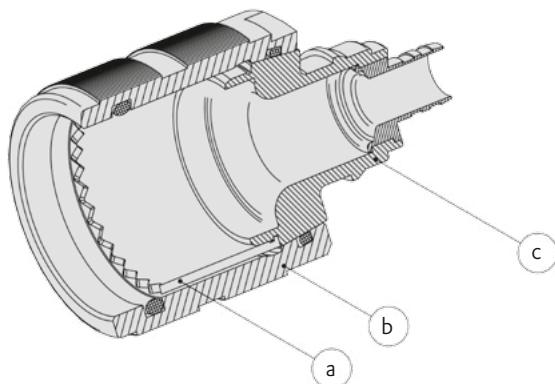


## Crimp flange adaptor for circular connectors

MIL standard connectors are a particular family of circular connectors with very demanding shielding requirements, not only in terms of EMI/RFI but also as a protection against unintended interceptions.

In addition, military applications also do have superior requirements for mechanical robustness under rugged conditions. Inotec has developed special crimp adaptors that allow to improve the performance of standard circular connectors by a secure and reliable cable shield contact and a maximum traction and torque resistance of the cable connection.

### „CFSCE“ series – MIL crimp adaptors



(a) Sprocket sleeve  
(b) Coupling nut  
(c) Crimp flange adaptor

#### Specifications

- Crimp flange adaptor for MIL-C-38999 standard circular connectors
- The appropriate crimp flange diameter is cable specific and will be defined by the Inotec crimp data definition

#### Scope of supply

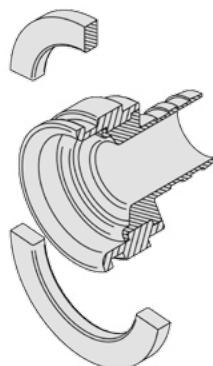
- 1 pc. sprocket sleeve (a)
- 1 pc. coupling nut (b)
- 1 pc. crimp flange adaptor (c)
- 2 pcs. sealing rings

#### Accessories

- Crimp ferrule
- Shrink tube

Complete article numbers and quotations will be provided after a cable specific crimp definition

### „CE“ series – universal crimp adaptor



#### Specifications

- Universal crimp adaptor for customized circular connectors.
- Crimp flange diameter to be defined according to a cable specific crimp definition.

#### Scope of supply

- 1 pc. crimp flange adaptor
- 2 pcs. half rings

#### Accessories

- Crimp sleeve

Complete article numbers and quotations will be provided after a cable specific crimp definition

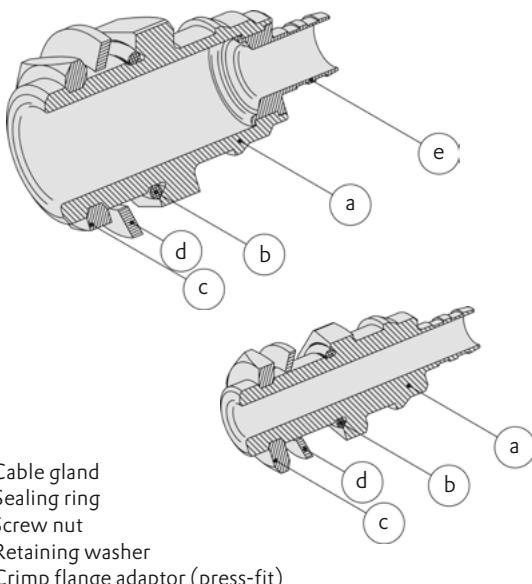


## EMI/RFI shielding cable gland

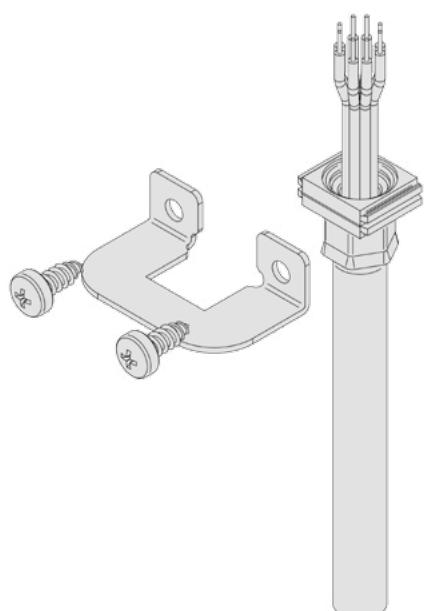
Special housing designs for machines, machine-tools or devices often require a space-saving direct feedthrough of cables.

Very often, those interfaces are problematic as a high level of IP sealing and good EMC performance through low transition resistances may be contradictory requirements.

### „KD“ series - crimp cable glands



### CF100 as ground contact / feedthrough



The Inotec cable gland uses the unique Inotec crimp flange technology to provide 360° cable shield contact and low transition resistance for the ground contact to the housing. If IP sealing of the feedthrough is also required, a sealing flange on the cable gland provides the contact surface for an additional shrink tube.

#### Specifications

- Cable gland, precision-turned threading
- Zinc plated brass alloy provides optimal ground contact
- Small diameters as single-piece part (lower picture), wrench size 16 mm or bigger with press-fit adaptor (e)

#### Scope of supply

- 1 pc. cable gland (a)
- 1 pc. sealing ring (b)

#### Accessories

- Screw nut (c)
- Retaining washer (d)
- Crimp ferrule
- Shrink tube (size and type on demand)

Complete article numbers and quotations will be provided after a cable specific crimp definition

The particular geometry of the Inotec CF100-x/x crimp flange allows a special use derived from its primary function as interface between cable and connector hood:

By using the center groove of the CF100 double-dovetail as a guiderail, the flange may also be held by a fastening bracket serving as attachment and ground contact at the same time.

Please contact us for more details or customized solutions.

# EMC-compliant cable connections





# Components for crimp technology, cable clamps and blind plugs

The correct assembly of shielded cables is a crucial criterion for electrical and mechanical functionality of HF-shielding connector hoods as well as for direct cable entries and passages in shielded terminal devices.

The connection between a connector hood and its cable and cable shield in particular has to comply with a number of essential requirements:

- A low-resistance connection between cable shield and hood with a constant performance over long periods of use as well as under mechanical stress.
- A gap-free HF-sealing of the cable entry.
- Traction and torque relief with high retention forces remaining operative even in harsh conditions.
- An easy, efficient and economic assembly.

By developing the crimp flange technology Inotec has focused on this critical interface in particular and offers its customers an optimal solution for every cable type, appropriate mounting tools included. Special device configurations or the use of individually assembled cables may sometimes require a traction relief to be realized with a conventional cable clamp technique. For those cases Inotec has also developed appropriate components fitting to the double-dovetail cable entries of the HF-protecting Inotec full metal hoods.

The operational reliability of an entire application depends decisively upon a cable-specific matching of the components and assembly tools. For this reason the customer- and cable-specific determination and definition of the assembly parameters is a crucial part of the Inotec offer and ensures a safe, robust and reliable cable assembly.

## Advantages of the crimp flange technology

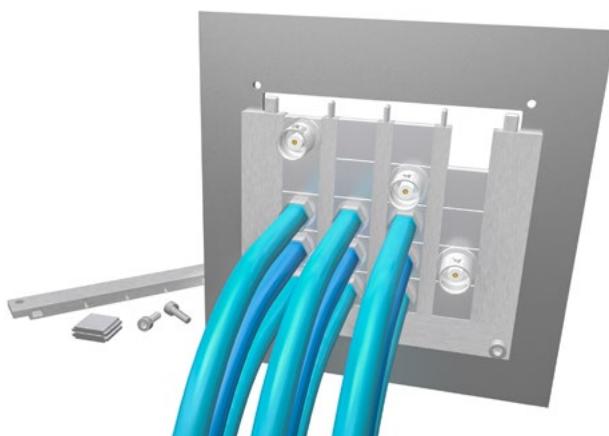
- Low shielding or transition resistances by 360° contacting of the cable shield
- High traction and torque resistance, typically even above the maximum tensile strength of the cables
- No compression of the cable cores, twisted wires are not "untwisted" by compression
- Fast, reliable and repeatable assembly process
- HF-sealing interface to the connector hood with the unique dovetail geometry

## Inotec crimp data definition

Inotec offers a unique service to its customers: a cable-specific crimp data definition. By realizing assembly tests with a cable sample our technicians determine the optimal assembly parameters for a reliable and easy cable assembly with a maximum mechanical strength and optimal cable shield contact.

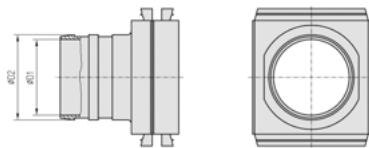
## Alternative components for cable and shield connection

- Cable clamps with various cross sections for specific cablings
- Cable entry through BNC plug
- All components in die-cast zinc and with Inotec dovetail design for low transition resistances





## Crimp flange CF100-x/x



### Specifications

- Crimp flange suitable for all Inotec 9- to 37-way D-sub, M12 and MSF-series hoods

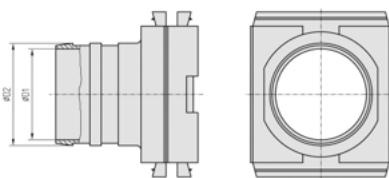
### Scope of supply

- 1 pc. crimp flange CF100-x/x

Art.-No.  
CF100-x/x

x/x indicates D1/D2 (inner/outer diameter in mm,  
D1 max. 8,0 mm)

## Crimp flange CF200-x/x



### Specifications

- Crimp flange suitable for all Inotec 50- to 104-way D-sub and MSF-series hoods

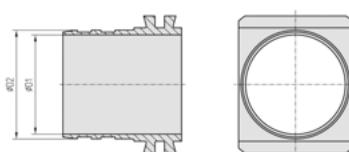
### Scope of supply

- 1 pc. crimp flange CF200-x/x

Art.-No.  
CF200-x/x

x/x indicates D1/D2 (inner/outer diameter in mm,  
D1 max. 11,0 mm)

## Crimp flange CF300-x/x



### Specifications

- One-piece crimp flange suitable for all Inotec 9- to 37-way D-sub, M12 and MSF-series hoods

### Scope of supply

- 1 pc. crimp flange CF300-x/x

Art.-No.  
CF300-x/x

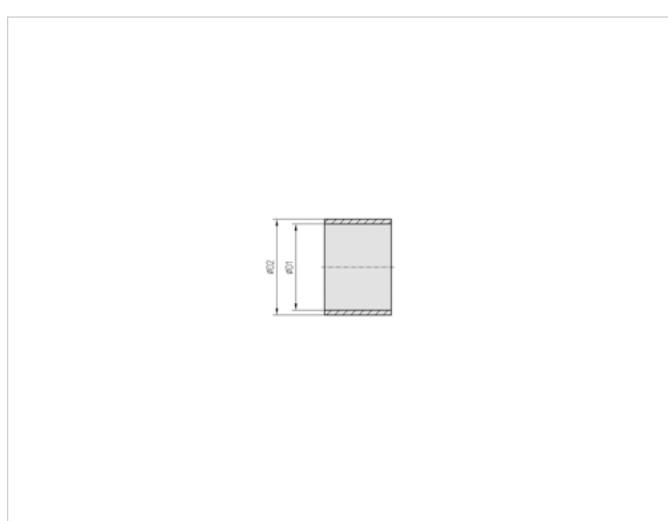
x/x indicates D1/D2 (inner/outer diameter in mm,  
D1 max. 11,0 mm)



All dimensions on part drawings are indicated in mm.



## Crimp ferrule CH-x/x



### Specifications

- Non-magnetic ferrule
- Brass alloy, zinc coated

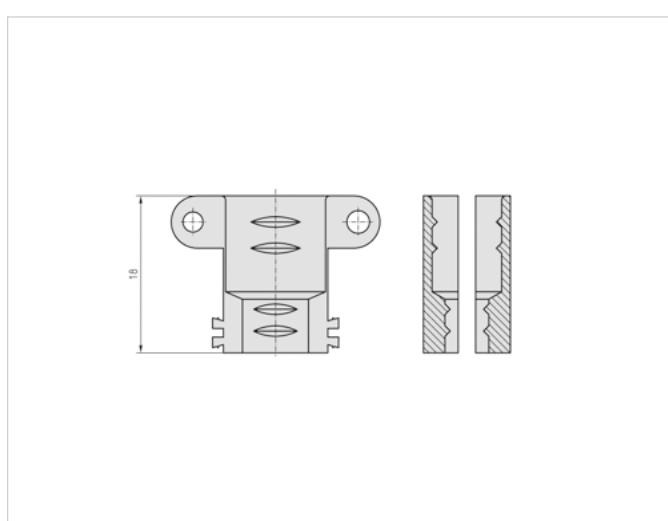
### Scope of supply

- 1 pc. crimp ferrule

Spare part Art.-No.  
CH-x/x

x/x indicates D1/D2 (inner/outer diameter in mm)

## Cable clamp DKS100



### Specifications

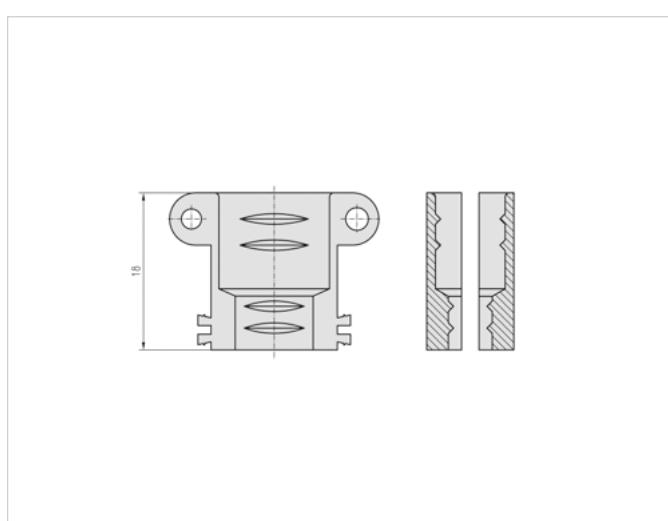
- Cable clamp suitable for all Inotec 9- to 37-way D-sub, M12 and MSF-series hoods
- Step-design with 2 different cross sections allows the assembly of cable diameters between approx. 3 and 12 mm

### Scope of supply

- 2 pcs. half-shells
- 2 pcs. countersink screws M2,5x10\*

Art.-No.  
DKS100

## Cable clamp DKS200



### Specifications

- Cable clamp suitable for all Inotec 50- to 104-way D-sub and MSF-series hoods
- Step-design with 2 different cross sections allows the assembly of cable diameters between approx. 5 and 14 mm

### Scope of supply

- 2 pcs. half-shells
- 2 pcs. countersink screws M2,5x16\*

Art.-No.  
DKS200

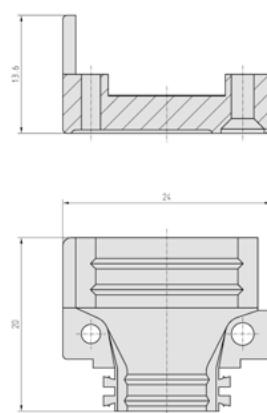
All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.





## Cable clamp DKS107

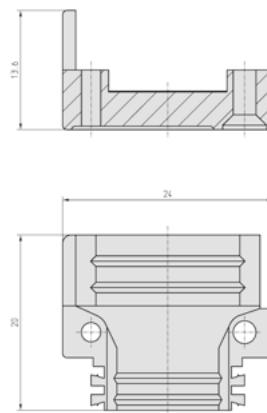


### Specifications

- Cable clamp suitable for all Inotec 9- to 37-way D-sub, M12 and MSF-series hoods
- For up to 3 cables with an outer diameter of 6 to 8 mm

Art.-No.  
DKS107

## Cable clamp DKS207

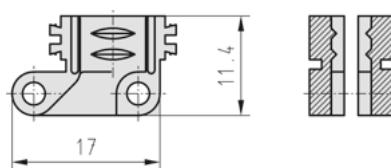


### Specifications

- Cable clamp suitable for all Inotec 50- to 104-way D-sub and MSF-series hoods
- For up to 3 cables with an outer diameter of 6 to 11 mm

Art.-No.  
DKS207

## Cable clamp DKS300



### Specifications

- Cable clamp suitable for all Inotec 9- to 37-way D-sub, M12 and MSF-series hoods
- Asymmetric design for limited installation spaces
- In some Inotec hood versions, DKS300 may also be mounted in an inverted position (clamp lies inside the hood)  
Please contact our customer service for this kind of use
- Maximum cable throughput diameter for single cables approx. 6 mm

Art.-No.  
DKS300

### Scope of supply

- 2 pcs. half-shells
- 2 pcs. countersink screws M2,5x10\*

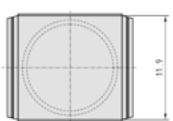
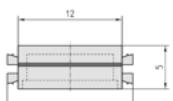


All dimensions on part drawings are indicated in mm.

\* Threadforming screws for assembly by the customer. Recommended fastening torque 0,5 Nm.



## Blind plug DBS100



### Specifications

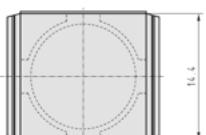
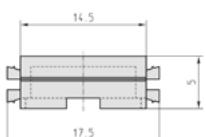
- Blind plug suitable for all Inotec 9- to 37-way D-sub, M12 and MSF-series hoods
- The blind plug allows an EMC-compliant sealing of obsolete cable entries
- Please note that blind plugs are included in the scope of supply of all hoods with >1 cable entries
- May also be used for special fittings (e. g. integration of LEDs, switches, etc.)

### Scope of supply

- 1 pc. blind plug

Art.-No.  
DBS100

## Blind plug DBS200



### Specifications

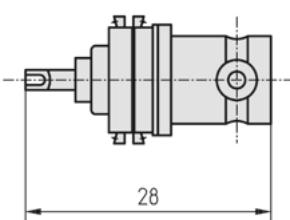
- Blind plug suitable for all Inotec 50- to 104-way D-sub and MSF-series hoods
- The blind plug allows an EMC-compliant sealing of obsolete cable entries
- Please note that blind plugs are included in the scope of supply of all hoods with >1 cable entries
- May also be used for special fittings (e. g. integration of LEDs, switches, etc.)

### Scope of supply

- 1 pc. blind plug

Art.-No.  
DBS200

## Blind plug with integrated BNC jack



### Specifications

- Blind plug DBS100 with integrated BNC jack (female) solder connector
- Allows an EMC-compliant quick-release and re-connect connection of coaxial cables on Inotec 9- to 37-way D-Sub or MSF connector hoods

### Scope of supply

■ 1 pc. blind plug with BNC plug 50 Ohm	Art.-No. DBS100-BNC001S
■ 1 pc. blind plug with BNC plug 75 Ohm	Art.-No. DBS100-BNC002S
■ 1 pc. blind plug with BNC plug 50 Ohm, insulated	Art.-No. DBS100-BNC003S

Variants with BNC plug (male) connectors available on request (DBS100-BNCxxP).

All dimensions on part drawings are indicated in mm.

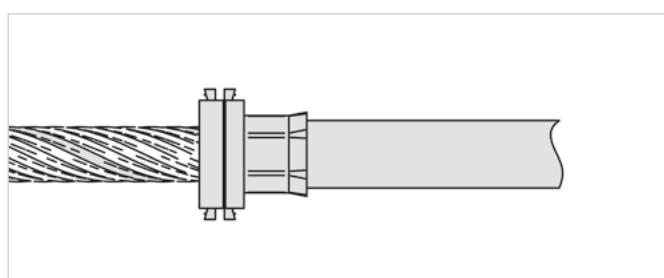
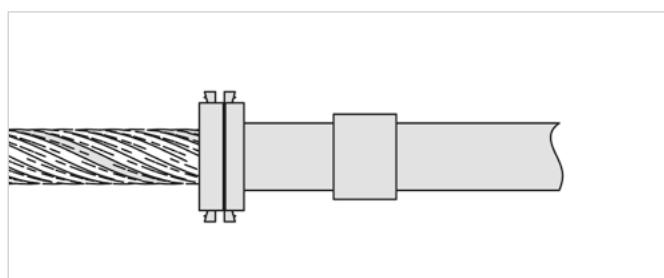
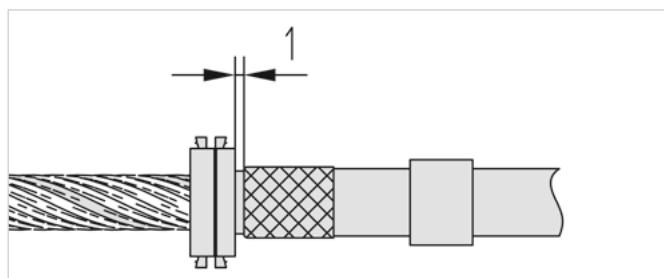
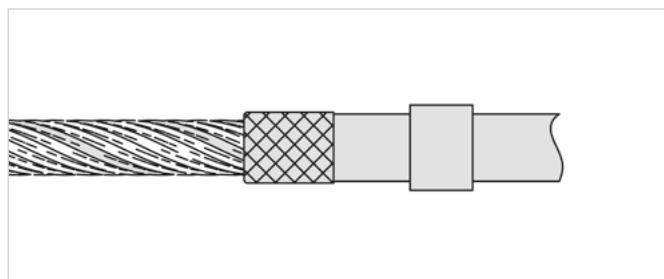
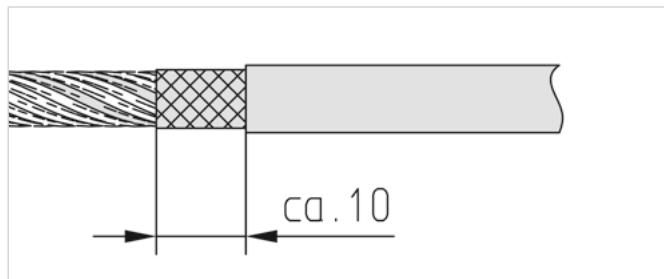




## Standard assembly procedure KV0001

The standard procedure described below allows an easy and reliable assembly process for the major part of all shielded cables. Variations in cable construction or materials may require the processing following different assembly procedures.

With the cable-specific crimp data definition we determine the required assembly parameters, component diameters and tool sizes for every specific application as a service for our customer (see facing page).



1. Dismantle the cable down to the braid and cut the braid, leaving it approx. 10 mm longer than the jacket.
2. Fold back the braid over the cable sheath and slide the crimp ferrule on the cable.
3. Slip the crimp flange over the conductors and possible intermediate layers and slide it underneath the shield mesh and the cable sheath. Enter the flange with cautious rotation while holding back the shield mesh. In this step, do not enter the flange completely but keep approx. 1 mm distance to the cable sheath in order to facilitate the cutting of the shield mesh.
4. Cut off any overlapping braid around the flange. Only now slide the crimp flange completely underneath shield mesh and cable sheath.  
Please note: Our insertion tool CFE facilitates the handling of the flange in step 3 and 4.
5. Slide the crimp ferrule forward until it is in contact with the flange. Keep it in position and crimp it with the indicated crimp dies.  
Important: During the crimping process the flange has to lay on the crimp dies. The faces of the hexagon should be parallel to the straight sides of the crimp flanges (see illustration).



All dimensions on part drawings are indicated in mm.



## The Inotec crimp data definition

A basic requirement to achieve sufficient mechanical strength and optimal cable shield contact is to match components, tools and applied assembly procedures for every specific cable assembly. Unlike comparable crimp technologies the Inotec system provides a finely graduated diameter range (0,5 mm steps) and covers a very wide range of crimp flange, ferrule and crimp die diameters.

As an exclusive customer service Inotec electronics GmbH provides a crimp data definition for every specific cable and all cable manufacturers.

### Required input data and sample:

- Cable sample (min. 0,5 m)
- Intended use (Inotec hood type)
- Cable data sheet (if available)

Based on this information, the Inotec mechanical laboratory realizes assembly tryout, traction and torque test in order to find out the optimal combination of convenient assembly, reliable

cable shield contact and best possible mechanical resistance of the crimped connection.

Once the crimp data definition is accomplished, the customer receives a crimp data sheet and a crimped cable sample.

The customer's data sheet contains the following relevant information.

- Documentation of the cable sample provided.
- Definition of the most suitable and reliable assembly procedure (if standard procedure KV0001 cannot be recommended, a corresponding data sheet with detailed processing instructions is provided)
- Definition of the most appropriate components (crimp flange and ferrule)
- Definition of the appropriate crimp die type and size
- Additional recommendations or assembly instructions if required

### Example for cable specific Inotec crimp data sheets

Crimpflansch*					
CF100	CF300		CF400		Crimpühse CH
CF200					Crimpbacken** DCB
CF200/300 for 9-31 pol. Gehäuse	CF200 for 50 pol. Gehäuse				CB
CF200 for 50 pol.					
Ø in mm	Kabel Typ	Crimpflansch*	Bestell Nr.: Crimpühse	Crimpbacken*	Bemerkungen
8,3	Kabelhersteller, Kabelbezeichnung, ggf. Art.-Nr.	CF100-6,5/7,5	CH-10/11	CB-095T oder DCB095T	1)
Bearbeitungshinweise / Bemerkungen					
1) Standard-Kabelverarbeitung KV001					
Bestellanweise: Welcher Crimpflansch einzusetzen ist, wird durch das verwendete Metallgehäuse bestimmt. * DCB für Hartmetallpressen (HPS01), CB für Handdruckpresse HZ100, CB201 für HZ201					
Maßangaben für Crimpflansch, Hülse und Crimpbacken			Aussteller	Datum	
Indec electronics GmbH Im Bürkfeld 19-21 74348 Laufach/A.N. DEUTSCHLAND Tel. 07133 / 9800 - 0 Fax. 07133 / 9800 - 25 <a href="mailto:info@inote-electronics.com">info@inote-electronics.com</a> <a href="http://www.inote-electronics.com">www.inote-electronics.com</a>			NN	TT.MM.JJJJ	
Kundenummer: 12345 PROFESSIONELLE QUALITÄT für den PROFESSIONELLEN EINSATZ					



## Important information

- Due to changing material compositions and manufacturing technologies the processing characteristics of cables may vary although the parameters according to the Inotec datasheet have not changed. Therefore Inotec recommends to check crimp data definitions being older than 3 years.
- A valid crimp data definition is mandatory for a correct order processing.

# Tools





## Inotec tools for cable assembly

For the assembly of premium high-precision components an appropriate high-end mounting equipment is needed. Inotec provides tools suitable for all quality-relevant processing steps.

Our premises for the development, production and choice of tools:

- Exact, reliable and permanently repeatable respect of the defined processing parameters
- Durability and easy replacement of interchangeable inserts and wear parts
- Ergonomic and efficient handling for economic and failure free processing

For assembling Inotec crimp flanges and ferrules special crimping tools and dies have been developed.

Geometrics, diameters and tolerances comply with the high requirements which we impose on our products and the result of their assembly. The exclusive use of the Inotec tools according to our cable-specific crimp data definition ensures a reliable function of the crimp connection.

For the assembly of the contacts Inotec relies on approved premium crimp technologies. For our precision turned crimp contacts we always recommend using 8-indent crimp tools to achieve maximum extraction forces without damaging the braids.

In addition to the crimp technology Inotec provides assembly devices and standard tools for assembly of connectors, crimp flanges and hoods. We also put great emphasis on easy handling, quality and durability. Often there are the small details making the difference: Our locking screws with Allen® key socket facilitate the assembly under unfavorable installation situations. A simple hexagonal key with ball-nose allows to tighten the screw under an angle of up to 30°. Please do not hesitate to contact us for any mounting problems or general questions concerning assembly.

### Processing tools for the original Inotec crimp flange technology

- Hand tool for one-hand operation in workshop or field assembly
- Hand lever press for stationary workshop assembly
- Wear-resistant special crimp dies in hardened steel, wrench sizes in 0,5 increments
- Special assembly devices for Inotec crimp flanges
- High-quality shears for braid-trimming

### Processing tools for crimp contacts

- 8-indent tool for precision turned crimp contacts
- Precision tools for female crimp contacts DIN 41612 type B
- Insertion and extraction tool

### Various assembly tools

- We recommend the use of our ball-nose Allen® key SDK01 for all locking screws with hexagon socket
- You will find product-specific tools and devices (e.g. punching tool for coding pins) in the respective catalogue chapter



## Hand lever press IHP500



### Specifications

- Versatile hand lever press in solid construction providing sufficient pressure for processing of Inotec crimp technology
- The 10 mm shank adaptor allows a quick and easy exchange of crimp dies. This makes IHP500 an ideal equipment for workshop production and frequently changing low-volume series.

Max. pressure	[kN]	5,0
Travel	[mm]	40
Adjustable working height	[mm]	45-220
Push rod diameter	[mm]	20
Shank diameter	[mm]	10H7x25
Overhang	[mm]	63
Table size	[mm]	110x60
DIN 650 groove	[mm]	10
Ground surface	[mm]	110x160
Total weight	[kg]	8,5

### Scope of supply

- 1 pc. of hand lever press (dies not included)

Art.-No.  
IHP500

## Crimp dies for hand lever press



### Specifications

- Crimp dies for hand lever press IHP500

### Scope of supply

- 1 set of crimp dies

Art.-No.  
DCBxxx(T)\*





## Hand crimp tool HZ100



### Specifications

- Precision hand tool with linear travel, designated for the processing of Inotec crimp components
- All tool components under mechanical load are made in high-strength steel, parts under particular stress are hardened
- The compact design allows an easy one-hand crimping
- Appropriate Inotec crimp dies in hardened steel
- The upper crimp die is pivoting around its fixing point in order to facilitate the insertion of the cable preassembled with crimp components
- The crimp dies are available starting with a minimum wrench size of 3 mm up to a maximum wrench size of 11,5 mm
- All crimp dies starting with size 4,5 mm optionally available with „T“ indent\*

### Tool and dies

- Hand crimp tool (without crimp dies)
- 1 set of crimp dies without „T“ indent
- 1 set of crimp dies with „T“ indent

Art.-No.  
HZ100  
CB-xxx\*  
CB-xxxT\*

## Hand crimp tool HZ201



### Specifications

- Precision hand tool with linear travel
- Compared to HZ100, the HZ201 provides a larger diameter range and higher crimp force, especially for large cable diameters
- Appropriate Inotec crimp dies in hardened steel
- The pivoting upper crimp die may be locked in „open“ position in order to facilitate the insertion of a cable with pre-positioned crimp components
- The crimp dies are available as standard program up to a maximum wrench size of 14,5 mm and up to 20 mm on request
- All crimp dies optionally available with „T“ indent\*

### Tool and dies

- Hand crimp tool (without crimp dies)
- 1 set of crimp dies without „T“ indent
- 1 set of crimp dies with „T“ indent

Art.-No.  
HZ201  
CB201-xxx\*  
CB201-xxxT\*

### \* Advices for correct cable assembly and crimp die sizes

Inotec provides a cable-specific crimp data definition, indicating the correct diameter of crimp components and the type and size of crimp dies to be used. Orders for crimp dies can only be handled if a valid crimp data definition

exists. If this should not be the case or your present crimp data definition is older than 3 years please send us a cable sample of 0,5 m length and we will provide the required crimp data definition rapidly.





## Hand crimp tool HZ148 / HZ248



### Specifications

- Hardened steel for long tool life
- Parallelly guided and segmented crimp dies ensure a reliable crimp quality and maximum extraction forces
- Its compact design with efficient kinematics allows one-handed use and low hand forces

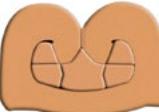
### Standard versions

- Hand tool for wire cross sections 0,14-0,5 mm<sup>2</sup>
- Hand tool for wire cross sections 0,5-1,5 mm<sup>2</sup>

Art.-No.

HZ148

HZ248



### B-Crimp

- Cross-section photomicrograph of a crimped contact
- Contact type FCC1S-200
- Crimped with HZ148

## 8-indent hand crimp tool



### Specifications

- 8-indent crimp tool in MIL standard quality
- Suitable for all high-precision turned Inotec D-Sub and M12 crimp contacts
- Adjustable depth of crimp
- Interchangeable positioner for different contact types

### Standard versions

- Hand crimp tool without positioner
- Positioner suitable for all Inotec D-Sub and M12 contacts

Art.-No.

M22520/2-01

M22520/2-08

Positioners for different contact types available on request

## Contact insertion / extraction tool



### Specifications

- Tool for insertion and extraction of standard D-Sub crimp contacts and Inotec M12 crimp contacts
- Two-piece design, red side for insertion, white side for extraction

### Scope of supply

- 1 pc. contact insertion / extraction tool

Art.-No.

DCT100





## Assembly device CFE



### Specifications

- The assembly device helps to hold the crimp flange while it is pushed underneath the cable sheath and shield
- The ergonomic shape reduces the manual forces during assembly and allows an efficient and fatigueless crimp procedure
- Available for all crimp flange types

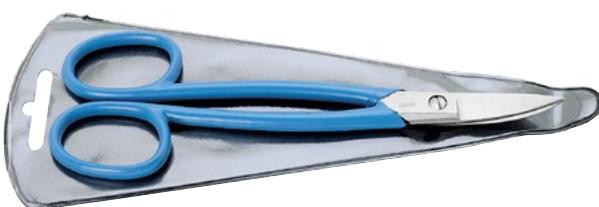
### Standard versions

- Assembly device for CF100 and CF300
- Assembly device for CF200
- Assembly device for CF400

### Art.-No.

CFE100  
CFE200  
CFE400

## Wire shears



### Specifications

- Blades in hardened steel, suitable for trimming of metal wires and braids
- The bended tip facilitates the trimming of cable shield braids during crimp assembly process

### Scope of supply

- 1 pair of wire shears (incl. envelope)

### Art.-No.

CS01

### Complementary equipment

- 1 pair of cable shears (without illustration)

### Art.-No.

CS02

## Ballnose hexagon screw driver



### Specifications

- Hexagon screwdriver in hardened steel
- Wrench size 2,5 mm
- The ballnose design allows tightening of hexagon socket screws under an angle of 30°

### Scope of supply

- 1 pc. screwdriver, wrench size 2,5 mm

### Art.-No.

SDK01



## Technical support, engineering and functional analysis

Interconnection design, especially of EMI/RFI protected interfaces should be made in three stages. In a first step, all relevant factors of influence have to be determined. Then, the most suitable components building the interface have to be tailored to suit the specific requirements. Finally, the optimal assembly process in terms of quality, reliability, repeatability and convenience has to be defined.

Inotec electronics GmbH is providing an integrated service to its customers in order to determine the best possible interconnection design:

### Technical support, application engineering

- Consulting service for product choice
- Support in case of application issues
- Cable specific crimp data definition
- Instruction and training for correct crimp flange and connector assembly

### Engineering, design and prototyping

- Packaging space studies
- Application-specific design variants
- Prototype and low volume production

### Test laboratory

- Mechanical testing (traction, torque)
- EMC (screening attenuation, transition resistances)
- Application specific tests (Salt-spray, derating, photomicrograph)

### Example of a photomicrograph analysis

Photomicrograph of a 4-wire data cable, crimped with an Inotec crimp flange CF100 and crimp ferrule according to standard assembly procedure KV0001. Crimped without "T" indent. Please note the 360° contact between cable shield mesh and crimp flange.

In the whole crimped section there is no compression of the cable wires. Twisted wires will not be untwisted like e.g. in cable clamps.



## Errors and technical modifications excepted

We reserve the right to change our product design without prior information if this should be required for quality improvement, enlarged application spectrum or producibility. Inotec does not assume any obligation to provide spare parts for obsolete articles. All technical information given in the present catalogue

is without guarantee and only valid for the component concerned. Inotec does not assume any warranty for their use in the final applications and their performance. The testing of any final application for correct function and the suitability of the chosen connector for this application relies on the end user.

## Please contact us, we are at your disposal.

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e-mail: [info@inotec-electronics.com](mailto:info@inotec-electronics.com)

General product information and catalogue download available at

[www.inotec-electronics.com](http://www.inotec-electronics.com)



or send us your request directly using the inquiry form on the opposite page.

Please fill in the present form and send it  
by e-mail to [sales@inotec-electronics.com](mailto:sales@inotec-electronics.com)  
or per fax to **+49 (0)7133-9800-25**  
or send a copy of this form together with a cable sample  
to our postal address.

**Inotec electronics GmbH**  
**Im Vorderen Burgfeld 19-21**  
**74348 Lauffen am Neckar**  
**Germany**

**Contact data**

Company

Name

Function

Tel.

e-mail

Subject (project title or keyword for further exchanges)

**Cable-specific crimp data definition**

(Please send us a cable sample of min. 0,5 m length for assembly testing)

Manufacturer's cable specification (or cable data sheet)

**Product request**

(If possible, please add a sketch of the application)

Description

**Sketches / notes**

**D-Sub full metal hoods with screw locking (series MS, MSB, MSBS and MSX)**

Art.-Nr.	Cable entry		Screw type and -head			Codable	Page	Comment
	Number/Angle	Size	4-40 UNC	M3	Screw head			

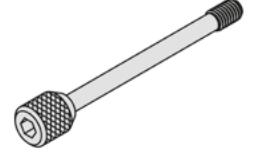
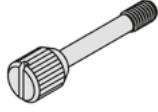
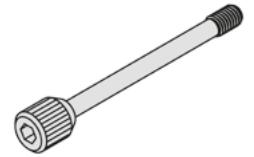
Sub-D 09 / HD15							
DG09MS	1x0°	CF100	PZ1		Knurled		19
DG09MS-3	1x0°	CF100		Slotted	Knurled		19
DG09MS-80	1x0°	CF100	Allen® SW2,5, Slotted		Plain surface		19
DG09MS-80-KOD	1x0°	CF100	Allen® SW2,5, Slotted		Plain surface		19
DG09MS-85	1x0°	CF100		Slotted	Knurled		19
DG09MS-90	1x0°	CF100		Allen® SW2,5	Plain surface		19
DG09MS-90-KOD	1x0°	CF100		Allen® SW2,5	Plain surface		19
DG09MS-4	1x0°	CF100	Allen® SW2,5		Crossed knurling		19
DG09MS-4-3	1x0°	CF100		Allen® SW2,5	Knurled		19
DG09MS-4-C104	1x0°	CF100	Hexagon bolts*				19
DG09MS-1	1x30°	CF100	PZ1		Knurled		20
DG09MS-1-3	1x30°	CF100		Slotted	Knurled		20
DG09MS-1-80	1x30°	CF100	Allen® SW2,5, Slotted		Plain surface		20
DG09MS-1-80-KOD	1x30°	CF100	Allen® SW2,5, Slotted		Plain surface		20
DG09MS-1-90	1x30°	CF100		Allen® SW2,5	Plain surface		20
DG09MS-1-90-KOD	1x30°	CF100		Allen® SW2,5	Plain surface		20
DG09MS-2	1x30°	CF100	Allen® SW2,5		Crossed knurling		20
DG09MS-2-KOD	1x30°	CF100	Allen® SW2,5		Crossed knurling		20
DG09MS-2-3	1x30°	CF100		Allen® SW2,5	Knurled		20
DG09MS-2-3-KOD	1x30°	CF100		Allen® SW2,5	Knurled		20
DG09MS-61	1x0°	CF100	Hexagon bolts*				20
DG09MS-63	1x0°	CF100		Hexagon bolts*			20
DG09MSX	1x0°	CF100		Hexagon, Slotted	Hexagon		24
DG09MS-1X	1x30°	CF100		Hexagon, Slotted	Hexagon		24
DG09MSB	2x30°	CF100	Hexagon, Slotted		Hexagon		27
DG09MSB-C102	2x30°	CF100	Hexagon, Slotted		Hexagon		27
DG09MSB-91	2x30°	CF100		Allen® SW2,5	Plain surface		27
DG09MSB-91-C101	2x30°	CF100		Allen® SW2,5	Plain surface		27
DG09MSBS	2x30°	CF400	Allen® SW2,5		Plain surface		28
DG09MSBS-C101	2x30°	CF400	Allen® SW2,5		Plain surface		28
DG09MSBS-91	2x30°	CF400		Allen® SW2,5	Plain surface		28
DG09MSBS91-C101	2x30°	CF400		Allen® SW2,5	Plain surface		28

Sub-D 15 / HD26							
DG15MS	1x0° 1x90°	CF100	PZ1		Knurled		21
DG15MS-3	1x0° 1x90°	CF100		Slotted	Knurled		21
DG15MS-80	1x0° 1x90°	CF100	Allen® SW2,5, Slotted		Plain surface		21
DG15MS-80-KOD	1x0° 1x90°	CF100	Allen® SW2,5, Slotted		Plain surface		21
DG15MS-85	1x0° 1x90°	CF100		Slotted	Knurled		21
DG15MS-90	1x0° 1x90°	CF100		Allen® SW2,5	Plain surface		21
DG15MS-90-KOD	1x0° 1x90°	CF100		Allen® SW2,5	Plain surface		21
DG15MS-1	1x30°	CF100			Knurled		21
DG15MS-1-3	1x30°	CF100		Slotted	Knurled		21
DG15MS-1-80	1x30°	CF100	Allen® SW2,5, Slotted		Plain surface		21
DG15MS-1-80-KOD	1x30°	CF100	Allen® SW2,5, Slotted		Plain surface		21
DG15MS-1-90	1x30°	CF100		Allen® SW2,5	Plain surface		21
DG15MS-1-90-KOD	1x30°	CF100		Allen® SW2,5	Plain surface		21
DG15MS-2	1x30°	CF100	Allen® SW2,5		Crossed knurling		21
DG15MS-2-3	1x30°	CF100		Allen® SW2,5	Knurled		21
DG15MSX	1x30°	CF100		Hexagon, Slotted	Hexagon		25
DG15MSB	2x30°	CF100	Hexagon, Slotted		Hexagon		27
DG15MSB-C102	2x30°	CF100	Hexagon, Slotted		Hexagon		27
DG15MSB-91	2x30°	CF100		Allen® SW2,5	Plain surface		27
DG15MSB-91-C101	2x30°	CF100		Allen® SW2,5	Plain surface		27

## D-Sub full metal hoods with screw locking (series MS, MSB, MSBS and MSX)

Art.-Nr.	Cable entry		Screw type and -head			Codable	Page	Comment
	Number/Angle	Size	4-40 UNC	M3	Screw head			
<b>Sub-D 25 / HD44</b>								
DG25MS	1x0° 2x30°	CF100	PZ1		Knurled		22	
DG25MS-3	1x0° 2x30°	CF100		Slotted	Knurled		22	
DG25MS-80	1x0° 2x30°	CF100	Allen® SW2,5, Slotted		Plain surface		22	
DG25MS-80-KOD	1x0° 2x30°	CF100	Allen® SW2,5, Slotted		Plain surface		22	
DG25MS-85	1x0° 2x30°	CF100		Slotted	Knurled		22	Spring washers
DG25MS-90	1x0° 2x30°	CF100		Allen® SW2,5	Plain surface		22	
DG25MS-90-KOD	1x0° 2x30°	CF100		Allen® SW2,5	Plain surface		22	
DG25MS-2	1x0° 2x30°	CF100	Allen® SW2,5		Crossed knurling		22	
DG25MS-2-3	1x0° 2x30°	CF100		Allen® SW2,5	Knurled		22	
DG25MS-2-85	1x0° 2x30°	CF100		Allen® SW2,5	Plain surface		22	Spring washers
DG25MS-2-85-KOD	1x0° 2x30°	CF100		Allen® SW2,5	Plain surface		22	Spring washers
DG25MSX	1x0° 2x30°	CF100		Hexagon, Slotted	Hexagon		25	Sealable
<b>Sub-D 37 / HD62</b>								
DG37MS	1x0° 2x30°	CF100	PZ1		Knurled		22	
DG37MS-3	1x0° 2x30°	CF100		Slotted	Knurled		22	
DG37MS-80	1x0° 2x30°	CF100	Allen® SW2,5, Slotted		Plain surface		22	
DG37MS-80-KOD	1x0° 2x30°	CF100	Allen® SW2,5, Slotted		Plain surface		22	
DG37MS-90	1x0° 2x30°	CF100		Allen® SW2,5	Plain surface		22	
DG37MS-90-KOD	1x0° 2x30°	CF100		Allen® SW2,5	Plain surface		22	
DG37MS-2	1x0° 2x30°	CF100	Allen® SW2,5		Crossed knurling		23	
DG37MS-2-3	1x0° 2x30°	CF100		Allen® SW2,5	Knurled		23	
DG37MSX	1x0° 2x30°	CF100		Hexagon, Slotted	Hexagon		25	Sealable
<b>Sub-D 50 / HD78</b>								
DG50MS	1x0° 2x30°	CF200	PZ1		Knurled		23	
DG50MS-3	1x0° 2x30°	CF200		Slotted	Knurled		23	
DG50MS-80	1x0° 2x30°	CF200	Allen® SW2,5, Slotted		Plain surface		23	
DG50MS-90	1x0° 2x30°	CF200		Allen® SW2,5	Plain surface		23	
DG50MS-2	1x0° 2x30°	CF200	Allen® SW2,5		Crossed knurling		23	
DG50MS-2-3	1x0° 2x30°	CF200		Allen® SW2,5	Knurled		23	
DG50MSX	1x0° 2x30°	CF200		Hexagon, Slotted	Hexagon		26	Sealable
<b>HD104</b>								
DG104MSX	1x0° 2x30°	CF200	Allen® SW2,5, Slotted		Plain surface		26	

## Available screw types for MS series

	<b>MS (Standard)</b> 4-40 UNC Knurled PZ1 (Cross-slotted)		<b>MS-80</b> 4-40 UNC Plain surface Allen® SW2,5 Slotted		<b>MS-2 / MS-4</b> 4-40 UNC Knurled Allen® SW2,5
	<b>MS-3</b> M3 Knurled Slotted		<b>MS-90</b> M3 Plain surface Allen® SW2,5		<b>MS-2-3 / MS-4-3</b> M3 Knurled Allen® SW2,5



All hoods of the MS series are provided with pre-assembled and retained locking screws.

The exchange of locking screws may reduce the retention of the screws.

Please contact our technical support if spare screws are needed.

\* Design type with female threads 4-40 UNC instead of passage holes,  
female hexagon bolts provided separately.





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