

Shell housings

Page

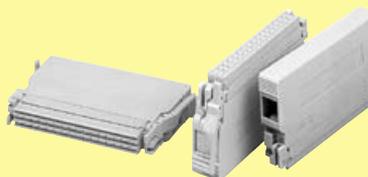
Summary of shell housings and accessories **20.02**

Shell housing C **20.04**



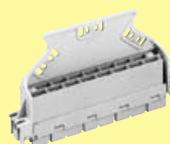
Shell housing A **20.08**

Shell housing B **20.10**



Shell housing D 15 **20.14**

Open hood G **20.17**



Junction element O **20.17**

Shell housings D 20/2 and D 20/4 **20.18**

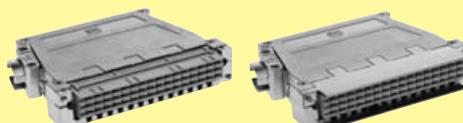


EMC housing **20.24**

Shell housings D 20/2 and D 20/4 metallised. **20.25**



Shell housings D 20 metal **20.28**



Electronic connectors in Heavy Duty Housings **20.30**

Application examples **20.32**

Summary shell housings and accessories



Appropriate connectors in shell housings	Types B, C, D, E	Type F	Types F, H, MH	Types E, F, H, MH	Types F, H, MH
<p>Check list: How to order shell housings and accessories.</p> <p>The Part No. is stated.</p>					
Shell housings	C 09 02 064 0501 09 02 064 0502 09 03 096 0501 09 05 048 0501	A 09 06 048 0501 09 06 048 0401 09 06 048 0402	B 09 06 048 0503 09 06 048 0504 09 06 048 0505	G 09 06 000 9957	O 09 06 000 9968 09 06 000 9930° ° order 2 pieces
Cable insert	09 02 000 9910 09 02 000 9911		09 06 000 9914 09 06 000 9915		
Insert for LED			09 06 000 9917		
<p>Locking lever</p> <p>Order 2 pieces, in some cases each with different Part Nos. for left and right hand</p>	09 02 000 9902 09 02 000 9903	Supplied with the shell housing	09 06 000 9913 09 06 000 9919		
<p>Locking screws</p> <p>Order 2 sets</p> <p>for fixing elements with male connectors</p>	09 02 000 9909 M 2.5 x 16 M 2.5	M 2.5 x 12 M 2.5	09 06 000 9926 M 2.5 x 20 M 2.5	Supplied with the shell housing	09 06 000 9926 M 2.5 x 20 M 2.5
for interface connectors U	09 02 000 9909 M 2.5 x 16 M 2.5	09 02 000 9909 M 2.5 x 16 M 2.5	09 06 000 9926 M 2.5 x 20 M 2.5	Supplied with the shell housing	—
for interface connectors I	09 02 000 9909 M 2.5 x 16 M 2.5	M 2.5 x 22 Supplied with the interface connector I	09 06 000 9955 M 2.5 x 26	Supplied with the shell housing	—
<p>Fixing brackets for 19" racks for male connectors</p>	C 	A 	B 	B 	B
Multiple fixing left	09 02 000 9919	09 06 000 9901	09 06 000 9907 09 06 000 9966 09 06 000 9908 09 06 000 9967	09 06 000 9907 09 06 000 9966 09 06 000 9908 09 06 000 9967	09 06 000 9907 09 06 000 9966 09 06 000 9908 09 06 000 9967
Multiple fixing right	09 02 000 9920	09 06 000 9902			
Single fixing left	09 02 000 9921	09 06 000 9905	09 06 000 9909	09 06 000 9909	09 06 000 9909
Single fixing right	09 02 000 9922	09 06 000 9906	09 06 000 9910	09 06 000 9910	09 06 000 9910
for female connectors			B 		B
Multiple fixing left			09 06 000 9933 09 06 000 9933		only ... 9930 09 06 000 9933 09 06 000 9933
Multiple fixing right					
<p>Fixing brackets for inverse male connectors on pcb</p>	R 				
R 1	09 02 000 9953				
R 32	09 02 000 9954				
<p>Distance fixing brackets for piggyback connectors</p>					
Type D top	09 04 000 9907			09 04 000 9907	
Type E bottom	09 04 000 9906			09 04 000 9906	
Type F top	09 06 000 9936			09 06 000 9936	
Type F bottom	09 06 000 9937			09 06 000 9937	
<p>Protection strip for 20 mm shell housing</p>			09 06 000 9929		
<p>Protection and fixing strip for 20 mm shell housing</p>			09 06 001 9909		

Female connectors Male connectors

Detailed system description see chapter 00

Appropriate connectors in shell housings	Types F, H, MH	Types F, H, MH	Types F, H, MH	Types F, H, MH
<p>Check list: How to order shell housings and accessories.</p> <p>The Part No. is stated.</p>				
Shell housings	<p>D 15</p> <p>09 06 048 0515</p>	<p>D 20</p> <p>09 06 048 0521 09 06 048 0522</p>	<p>D 20 metallised</p> <p>09 06 948 0521 09 06 948 0522</p>	<p>D 20 metal</p> <p>09 06 848 0550 09 06 848 0551</p>
Cable insert		09 06 000 9988 09 06 000 9989	09 06 900 9988	
Insert for LED		09 06 000 9986 09 06 000 9987	09 06 900 9986 09 06 900 9987	
<p>Locking lever</p> <p>Order 2 pieces, in some cases each with different Part Nos. for left and right hand</p>	Supplied with the shell housing			
<p>Locking screws</p> <p>Order 2 sets for fixing elements with male connectors</p>	<p>09 06 000 9926</p> <p> M 2,5 x 16</p> <p> M 2,5</p>	Supplied with the shell housing	Supplied with the shell housing	Supplied with the shell housing
for interface connectors U	—	—	—	—
for interface connectors I	—	—	—	—
<p>Fixing brackets for 19" racks for male connectors</p>	B 	B 	B 	B
<p>Multiple fixing</p> <p>left</p>	09 06 000 9907 09 06 000 9966	09 06 000 9907 09 06 000 9966 09 06 000 9995 09 06 000 9997	09 06 900 9907 09 06 900 9966 09 06 900 9995 09 06 900 9997	09 06 900 9997
right	09 06 000 9908 09 06 000 9967	09 06 000 9908 09 06 000 9967 09 06 000 9996 09 06 000 9998	09 06 900 9908 09 06 900 9967 09 06 900 9996	09 06 900 9996
<p>Single fixing</p> <p>left</p>	09 06 000 9909	09 06 000 9909 09 06 001 9934	09 06 900 9909 09 06 901 9934	09 06 901 9924
right	09 06 000 9910	09 06 000 9910 09 06 001 9935	09 06 900 9910 09 06 901 9935	09 06 901 9925
<p>for female connectors</p>	B 			
<p>Multiple fixing</p> <p>left</p>	09 06 000 9933			
right	09 06 000 9933			
Protection and fixing strip for 20 mm shell housing		09 06 001 9909	09 06 001 9909	

Shell housings

Female connectors Male connectors

Detailed system description see chapter 00

Shell housing C for types B, C, D, E and har-bus® 64



- ① Shell 1x
- ② Cover 1x
- ③ Blinding plate 1x
- ④ Cable tie 1x
- ⑤ Blinding piece 2x
- ⑥ Grounding plate 1x
- ⑦ Screw BZ 2.2 x 9.5
DIN ISO 1481 2x
- ⑧ Screw
- a) BZ 2.9 x 6.5
DIN ISO 1482 3x
- b), c), d) BZ 2.9 x 13
DIN ISO 1483 3x

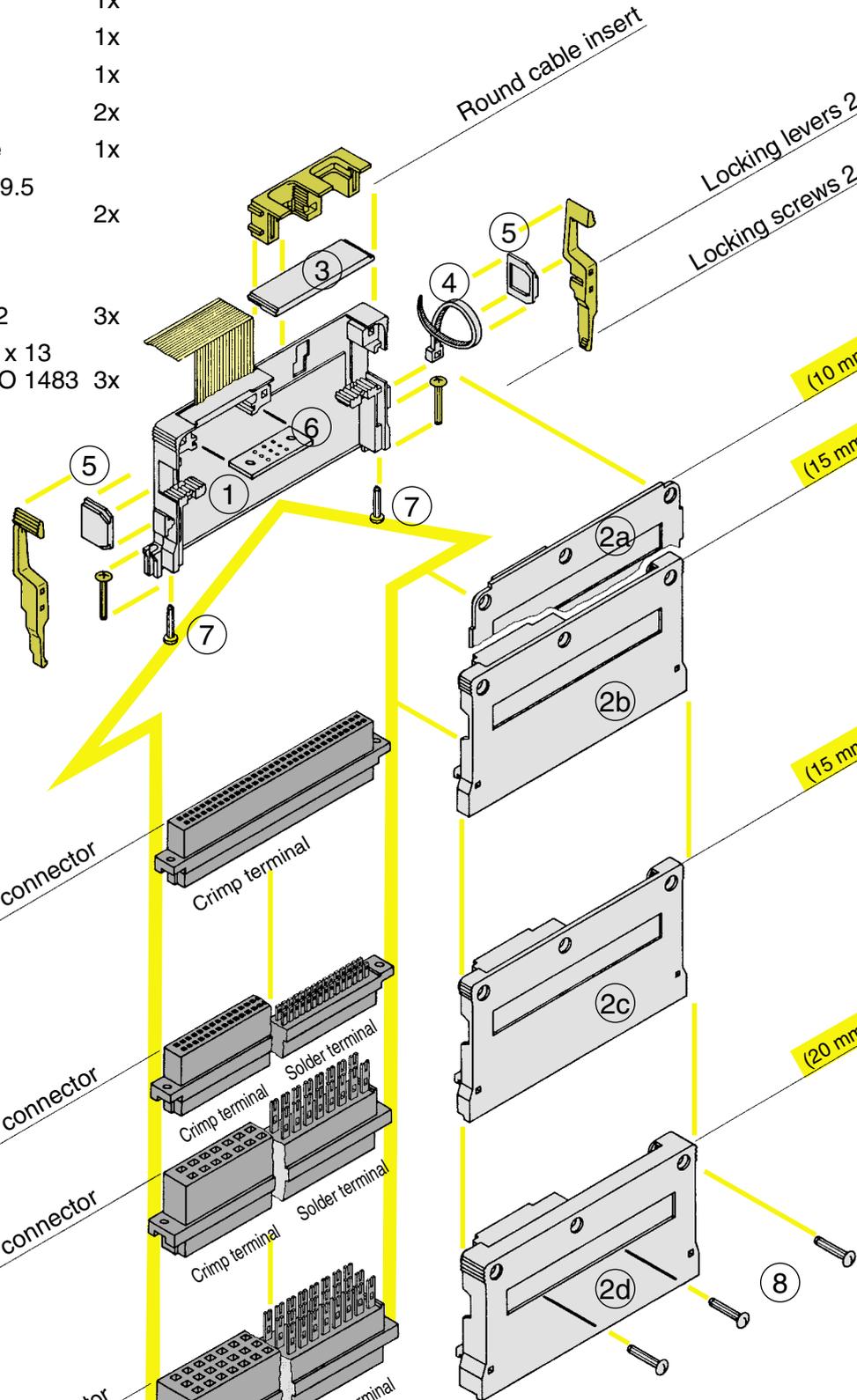
Round cable insert

Locking levers 2 x
Locking screws 2 x

(10 mm) 09 02 064 0501
(15 mm) 09 02 064 0502

(15 mm) 09 03 096 0501

(20 mm) 09 05 048 0501

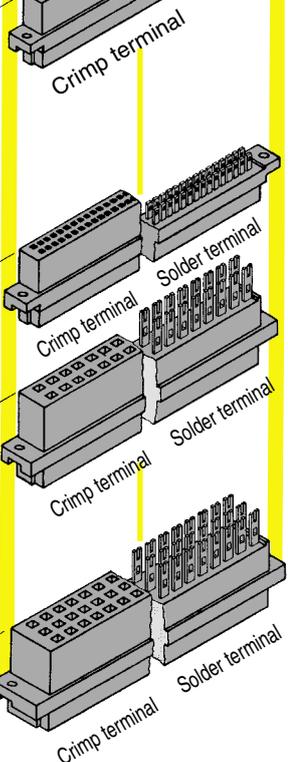


Type B female connector

Type C female connector

Type D female connector

Type E female connector
har-bus® 64 female connector



Separate accessories for housings

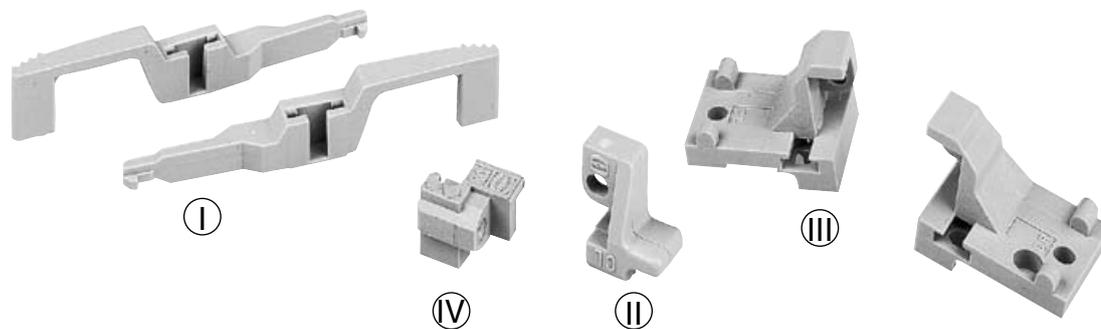
Fitting female connectors

Flat cable access

Housing parts supplied

Shell housings

Shell housing C



Accessories

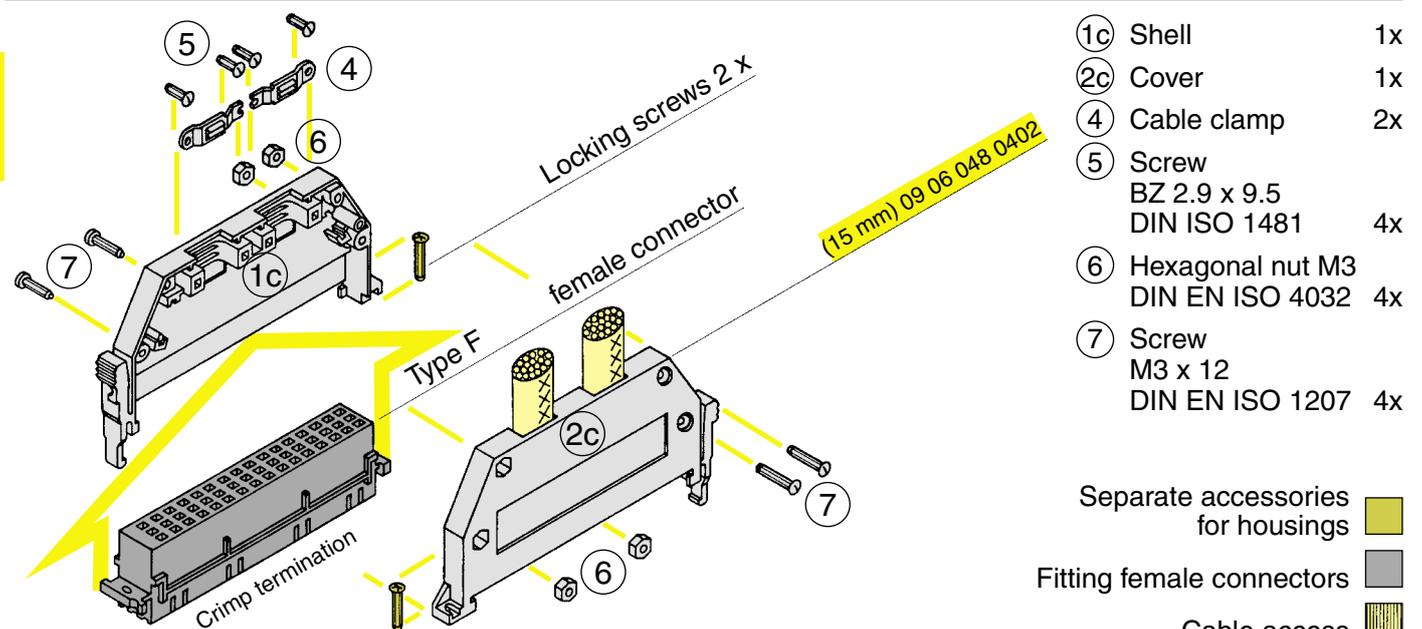
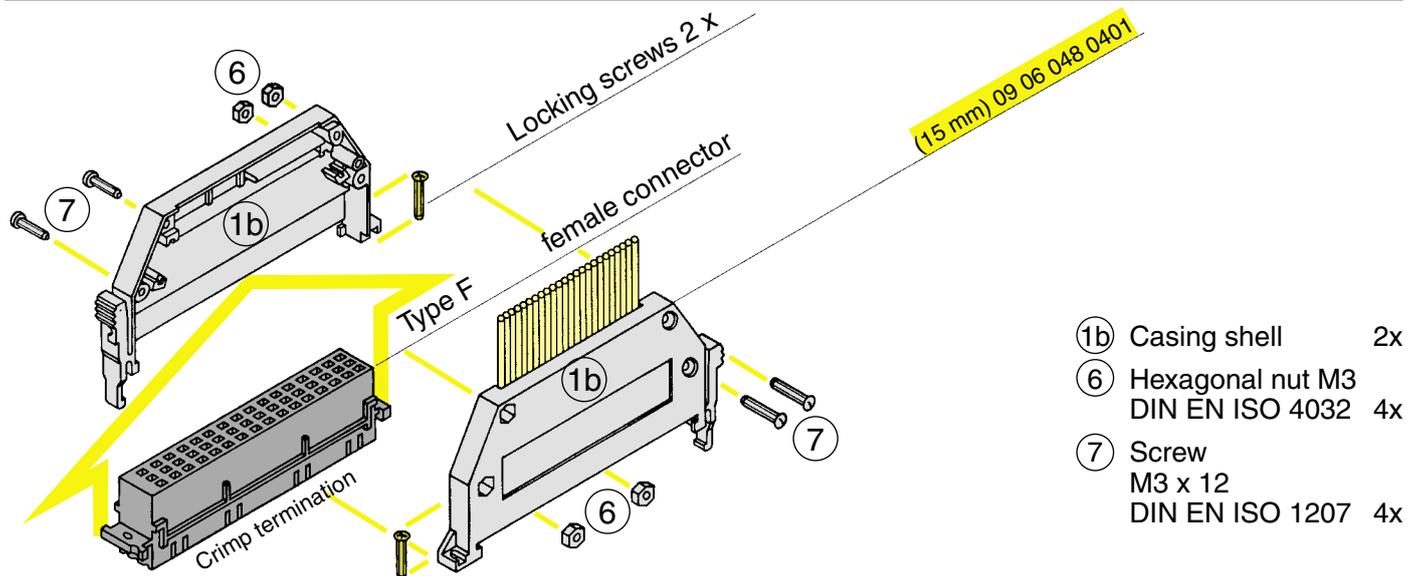
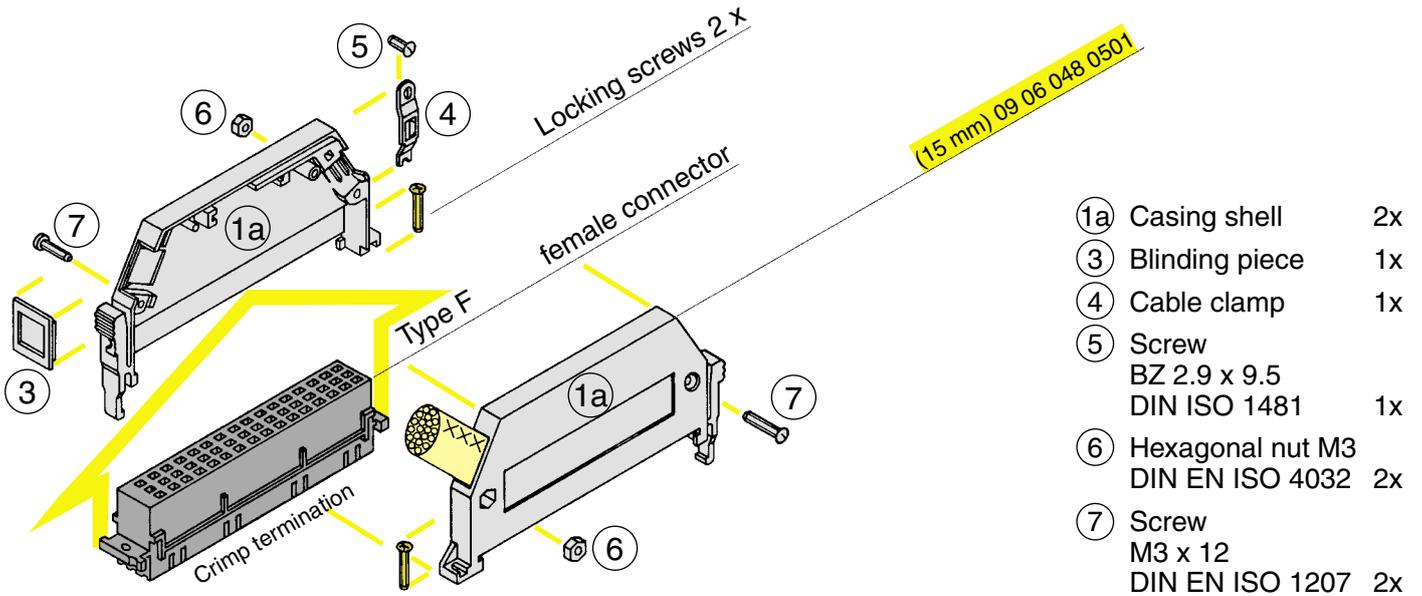
Identification	Part No.	Drawing	Dimensions in mm
Locking lever for shell housing C I	left 09 02 000 9902 right 09 02 000 9903		
Fixing brackets C for male connectors for 19" racks according to DIN EN 60297, part 3-101 Multiple fixing II	left 09 02 000 9919 right 09 02 000 9920		
Single fixing III	left 09 02 000 9921 right 09 02 000 9922		
Fixing brackets R for inverse male connectors on pcb's IV	R 1 09 02 000 9953 R 32 09 02 000 9954		

See application example 4, chapter 01

BZ 2.2 x 9.5
DIN ISO 7049

Shell housings

Shell housing A for type F



Shell housings

Separate accessories for housings

Fitting female connectors

Cable access

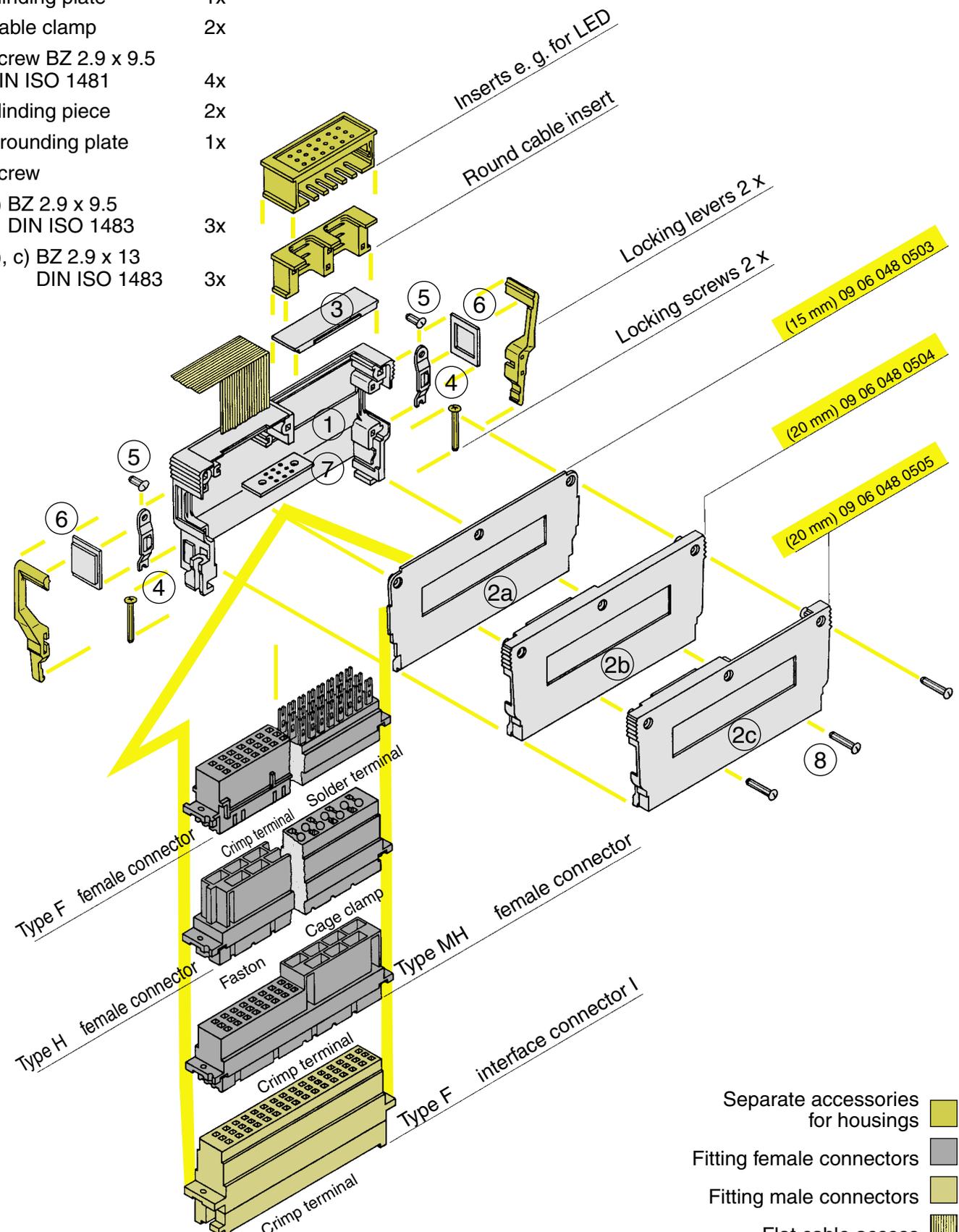
Housing parts supplied

20
08 Moulding material: thermoplastic resin, glass-fibre filled, UL 94-V0

Shell housing B for types F, H and MH



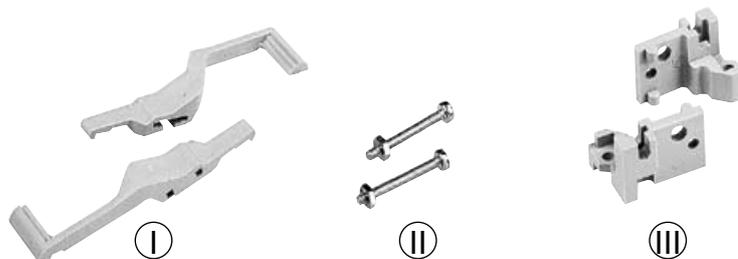
- ① Shell 1x
- ② Cover 1x
- ③ Blinding plate 1x
- ④ Cable clamp 2x
- ⑤ Screw BZ 2.9 x 9.5
DIN ISO 1481 4x
- ⑥ Blinding piece 2x
- ⑦ Grounding plate 1x
- ⑧ Screw
- a) BZ 2.9 x 9.5
DIN ISO 1483 3x
- b), c) BZ 2.9 x 13
DIN ISO 1483 3x



Shell housings

20
10 Moulding material: thermoplastic resin, glass-fibre filled, UL 94-V0

- Separate accessories for housings
- Fitting female connectors
- Fitting male connectors
- Flat cable access
- Housing parts supplied



Accessories

Identification Part No. Drawing Dimensions in mm

Locking lever for shell housing B

09 06 048 0503

09 06 000 9913¹⁾

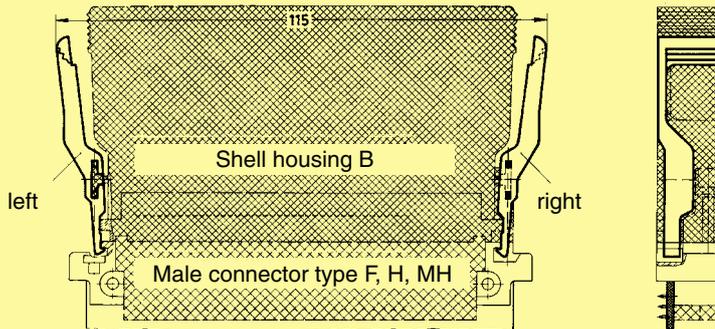


09 06 048 0504
09 06 048 0505

left
09 06 000 9913

right
09 06 000 9919

¹⁾ Order 2 pieces for one shell housing

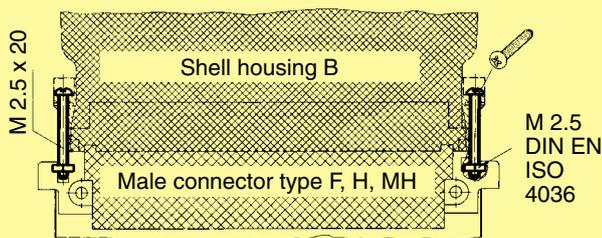


Locking screws



09 06 000 9926¹⁾

¹⁾ Order 2 pieces for one shell housing



Fixing brackets B for male connectors

for 19" racks according to DIN EN 60297, part 3-101

Multiple fixing without nut

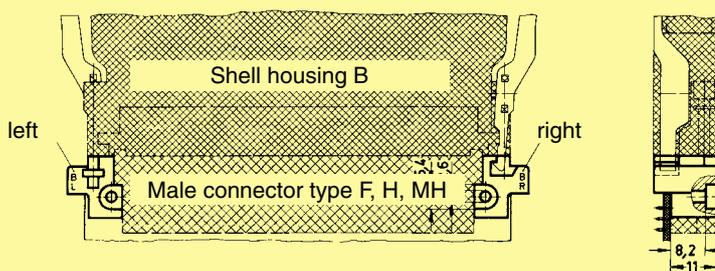
left
09 06 000 9907

right
09 06 000 9908

with nut
M 2.5 DIN 562

left
09 06 000 9966

right
09 06 000 9967

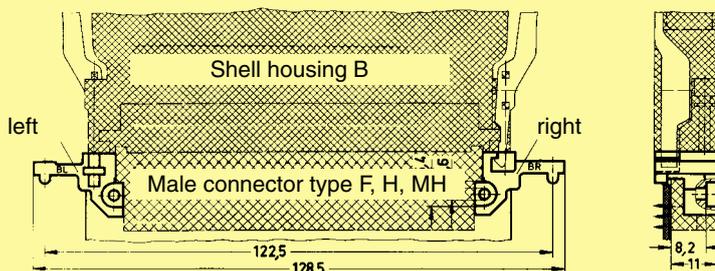


Single fixing without nut

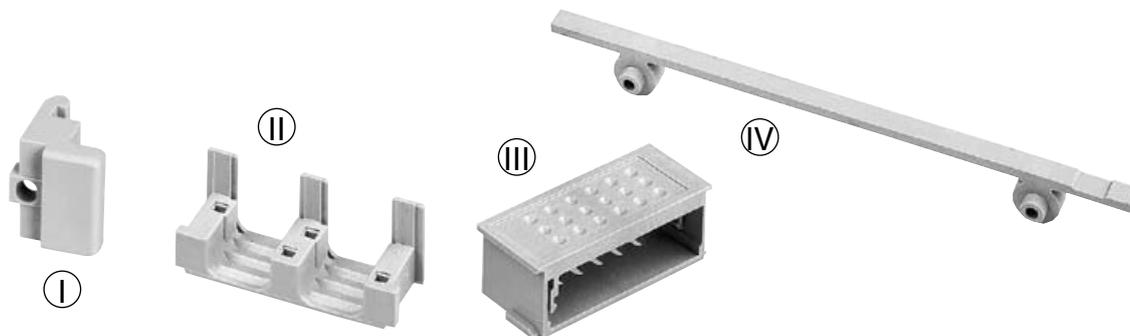


left
09 06 000 9909

right
09 06 000 9910

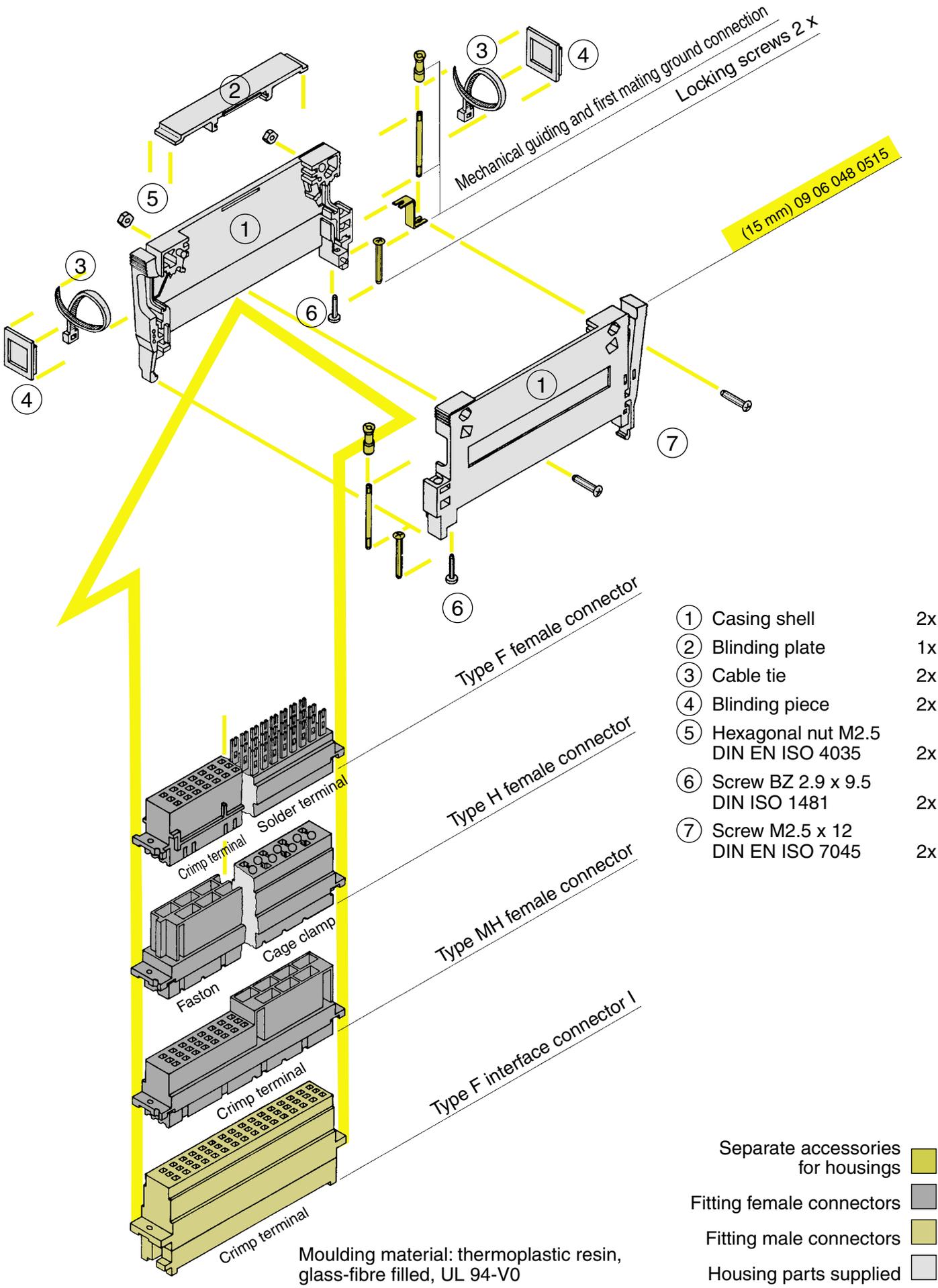


Shell housing B



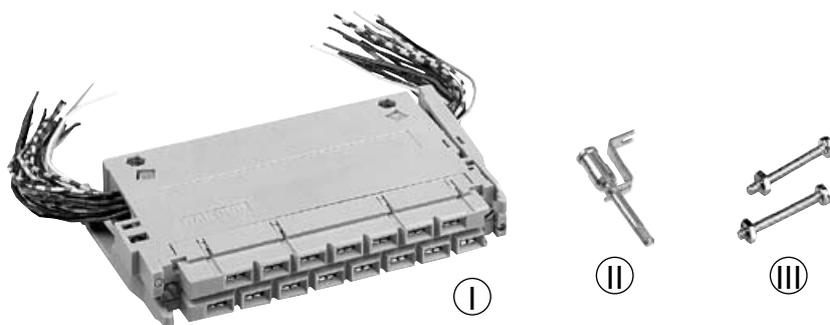
Accessories

Identification	Part No.	Drawing	Dimensions in mm
<p>Fixing brackets B for female connectors for 19" racks according to DIN EN 60 297, part 3-101</p> <p>Multiple fixing I</p> <p>1) Order 2 pieces for one female connector</p>	09 06 000 9933 ¹⁾	<p>M 2.5 x 8 DIN EN ISO 1207²⁾</p> <p>2x 09 06 000 9912</p>	
<p>Round cable insert 2 x ø 10</p> <p>for shell housings B 09 06 048 0503 09 06 048 0504</p> <p>Supplied with: Round cable insert 1x Blinding piece 1x</p>	09 06 000 9914		
<p>Round cable insert 2 x ø 12.5</p> <p>II</p> <p>for shell housing B 09 06 048 0505</p> <p>Supplied with: Round cable insert 1x Blinding piece 1x</p>	09 06 000 9915		
<p>Insert for LED</p> <p>III</p> <p>for shell housing B 09 06 048 0505</p>	09 06 000 9917	<p>pcb 35.5 x 17 x 1.5</p>	
<p>Protection strip</p> <p>IV</p> <p>Used with shell housings type B for front side access 09 06 048 0504 09 06 048 0505</p>	09 06 000 9929	<p>09 06 000 9909 09 06 000 9910</p>	



Shell housings

Shell housing D 15 for types F, H and MH



Identification

Part No.

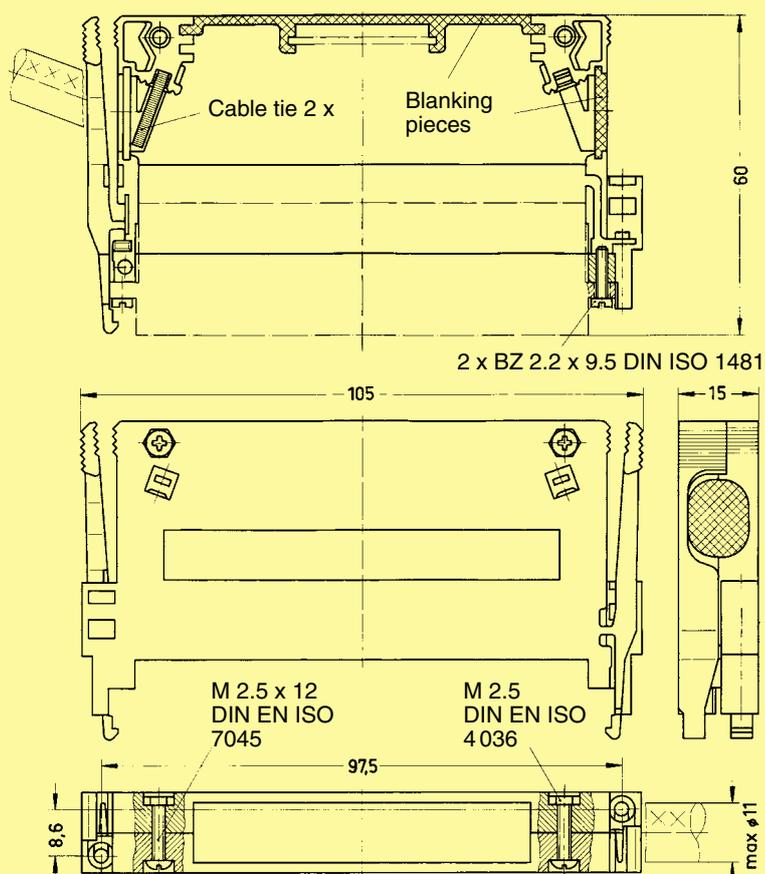
Drawing

Dimensions in mm

Shell housing D 15

I

15 mm
09 06 048 0515



Mechanical guiding and first mating ground connection

II

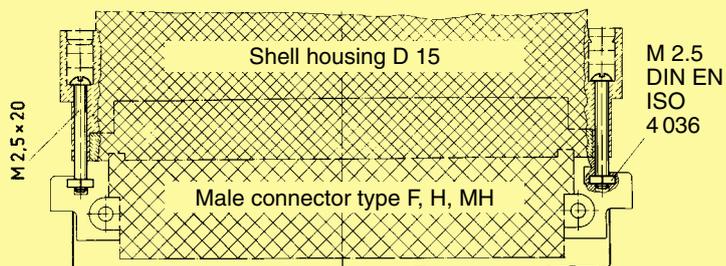
09 06 000 9961



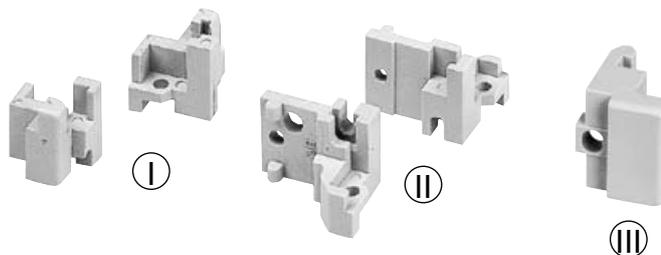
Locking screws

III

09 06 000 9926¹⁾



¹⁾ Order 2 pieces for one shell housing



Accessories

Identification Part No. Drawing Dimensions in mm

Fixing brackets B for male connectors

for 19" racks according to DIN EN 60 297, part 3-101

Multiple fixing

without nut



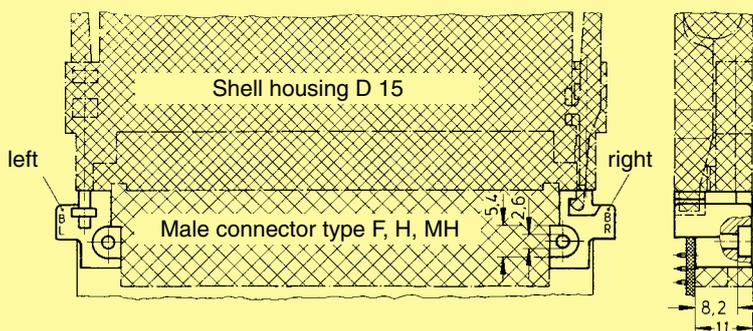
left
09 06 000 9907

right
09 06 000 9908

with nut
M 2.5 DIN 562

left
09 06 000 9966

right
09 06 000 9967



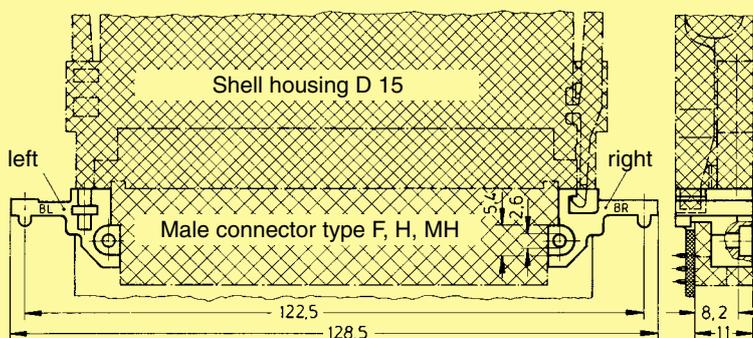
Single fixing

without nut



left
09 06 000 9909

right
09 06 000 9910



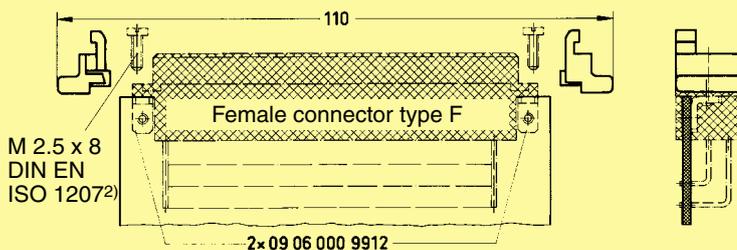
Fixing brackets B for female connectors

for 19" racks according to DIN EN 60 297, part 3-101

Multiple fixing



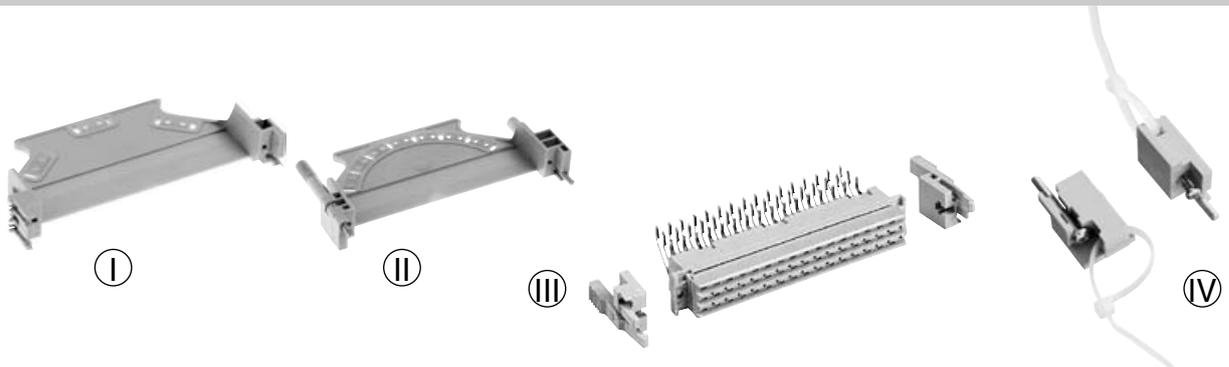
09 06 000 9933¹⁾



¹⁾ Order 2 pieces for one female connector

²⁾ nut and screw not supplied with fixing brackets

Open hood G, junction element O, locking lever



Identification Part No. Drawing Dimensions in mm

Open hood G I
for types E, F, H
and MH, for applications

A B C

Supplied with:
Open hood 1x
Locking screw 2x
(09 06 000 9958)
Cable tie 1x
Screw 2x

09 06 000 9957

Open hood G II
for types E, F, H
and MH, for application

C

Supplied with:
Open hood 1x
Pre-assembled,
undetachable locking
screw 2x
Cable tie 1x
Screw 2x

09 06 001 9939

Junction element O
for type F

IV

Supplied with:
Junction element 2x
Cable tie 2x
Screw 2x
Screw M2.5 x 20 2x

09 06 000 9968

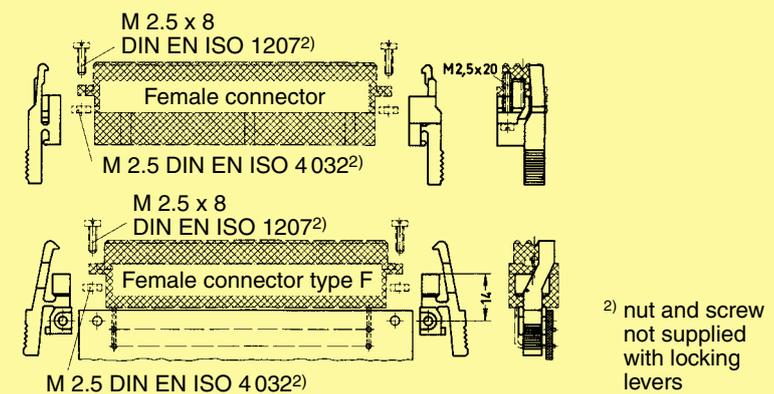
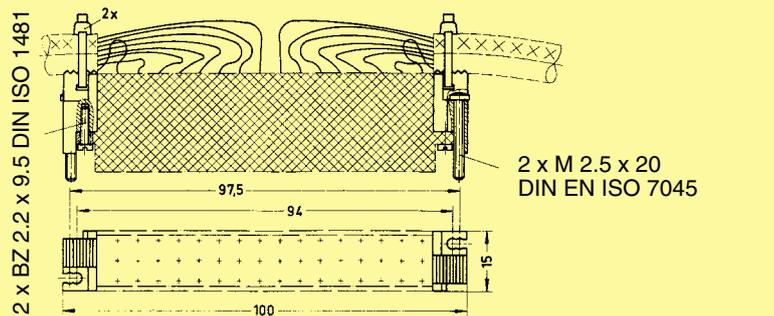
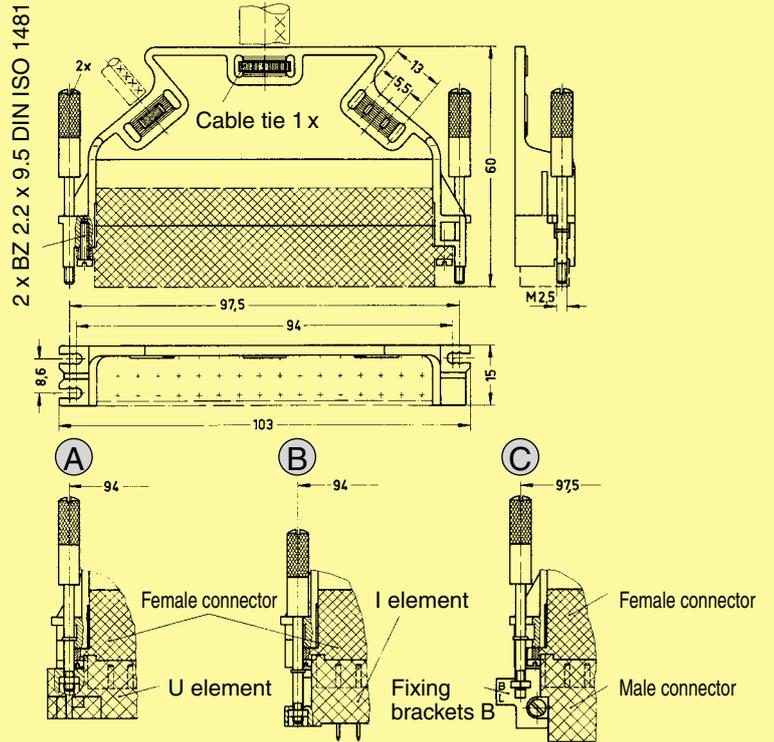
Locking lever
for type F, H and MH

III

09 06 000 9930¹⁾

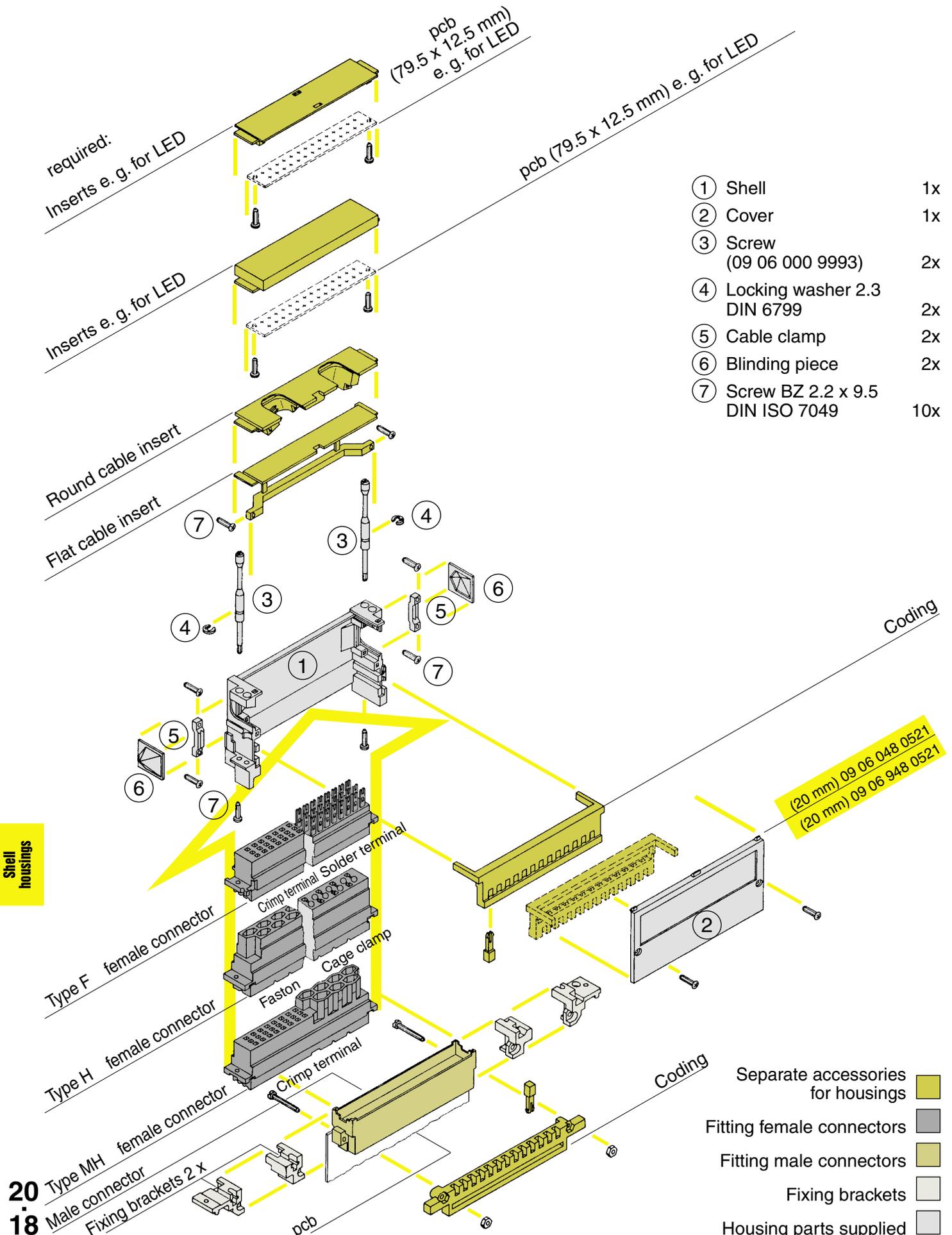
09 06 000 9911¹⁾

¹⁾ Order 2 pieces
for one female connector



²⁾ nut and screw
not supplied
with locking
levers

Shell housing D 20/2 for types F, H and MH



①	Shell	1x
②	Cover	1x
③	Screw (09 06 000 9993)	2x
④	Locking washer 2.3 DIN 6799	2x
⑤	Cable clamp	2x
⑥	Blinding piece	2x
⑦	Screw BZ 2.2 x 9.5 DIN ISO 7049	10x

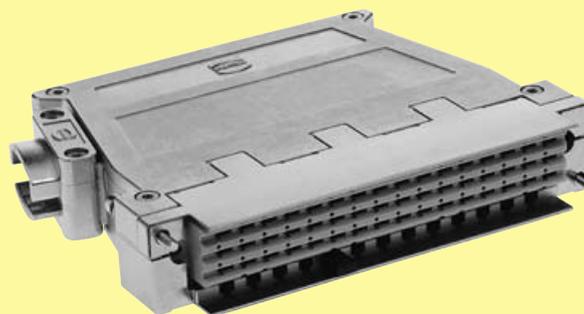
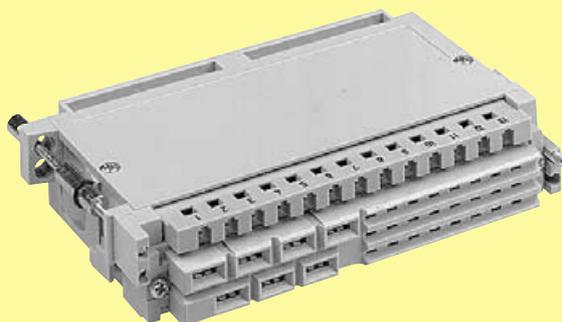
(20 mm) 09 06 048 0521
(20 mm) 09 06 948 0521

Shell housings

20
18

Separate accessories for housings	
Fitting female connectors	
Fitting male connectors	
Fixing brackets	
Housing parts supplied	

Moulding material: thermoplastic resin, glass-fibre filled, UL 94-V0



Fitting female connectors

Part-No.	Type	D 20/2	D 20/4	D 20 metal	D 20 metal HF
09 06 2__ 823	F with open solder lugs	X		X	X
09 06 2__ 853	F with closed solder lugs	X		X	X
09 06 248 3201	F moulding for crimp contacts	X	X	X	X
09 06 215 2871	H for faston	X		X	X
09 06 015 2813	H with cage clamps	X		X	X
09 06 231 2881	MH moulding for crimp contacts	X		X	X

Order example:

09 06 2__ 853

32 = 32 contacts
48 = 48 contacts

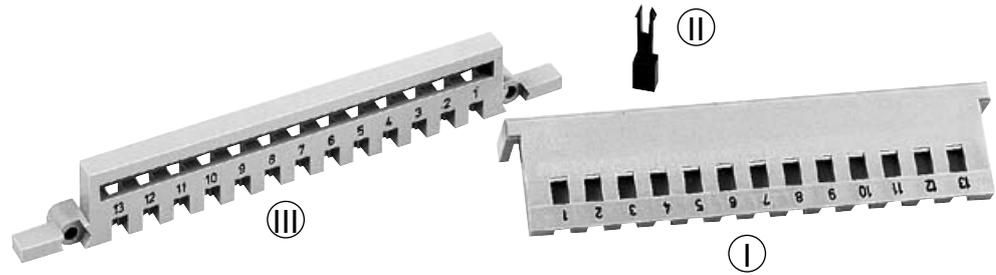


7 = performance level 3
6 = performance level 2
2 = performance level 1

Technical characteristics

	D 20/2	D 20/2 metallised ¹⁾	D 20/4	D 20/4 metallised ¹⁾	D 20 metal	D 20 metal HF
Part No.	09 06 048 0521	09 06 948 0521	09 06 048 0522	09 06 948 0522	09 06 848 0550	09 06 848 0551
Material	Polycarbonate	Polycarbonate	Polycarbonate	Polycarbonate	Zinc alloy	Zinc alloy
Surface	none	nickel/copper	none	nickel/copper	nickel-plated	nickel-plated
Weight [g]	36	44	43	52	182	188
Cable entries	side (2 x), top (2 x)	side (2 x), top (2 x)	side (4 x)	side (4 x)	side (2 x), top (2 x)	side (2 x) top (2 x)
Protection	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20

¹⁾ upper temperature limit is +105 °C



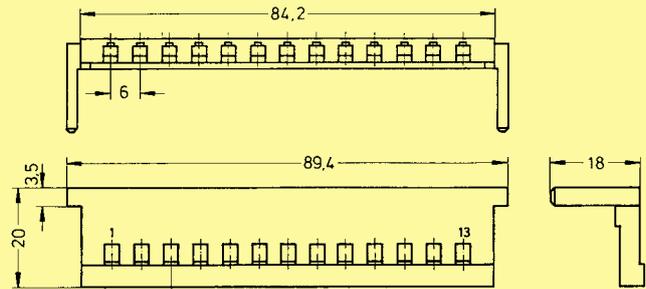
Coding

Identification Part No. Drawing Dimensions in mm

Code comb for shell housing³⁾
(can also be used as a blanking cover)



09 06 000 9984

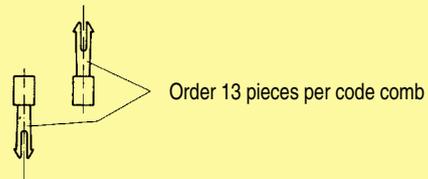


Coding pin³⁾



09 06 001 9905¹⁾

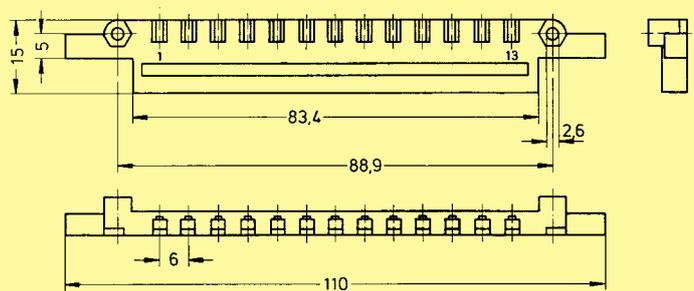
¹⁾ Order 13 pieces per code comb



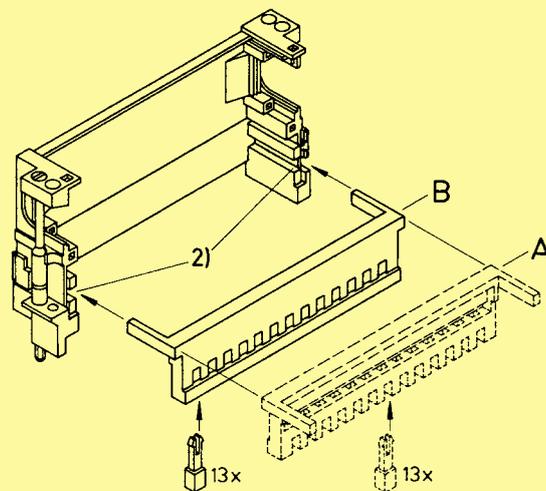
Code comb for male connectors³⁾



09 06 000 9985



Mounting possibilities for the code comb in the shell housing D 20/2



²⁾ Use the lower slot when coding the male connector with fixing brackets

Mounting example **A** max. cable entry \varnothing 14 mm to the top, see page 20.23
Mounting example **B** max. cable entry \varnothing 14 mm to the bottom, see page 20.23

³⁾ Fits D 20/2 and D 20/4

Identification	Part No.	Drawing	Dimensions in mm
<p>Mounting possibilities for code comb at the male connector with fixing brackets</p>			
<p>Fixing brackets B for male connectors* for 19" racks according to DIN EN 60297, part 3-101</p> <p>Single fixing* without nut</p> <p>with nut M 2.5 DIN 562</p>	<p>left 09 06 000 9909</p> <p>right 09 06 000 9910</p> <p>left 09 06 001 9934</p> <p>right 09 06 001 9935</p>		
<p>Multiple fixing* without coding at the fixing bracket without nut</p> <p>without coding at the fixing bracket with nut M 2.5 DIN 562</p> <p>with coding at fixing bracket¹⁾ with nut M 2.5 DIN 562</p> <p>15 mm</p> <p>20 mm</p> <p>15 mm</p> <p>20 mm</p>	<p>left 09 06 000 9907</p> <p>right 09 06 000 9908</p> <p>left 09 06 000 9966</p> <p>right 09 06 000 9967</p> <p>left 09 06 000 9995 09 06 000 9997</p> <p>right 09 06 000 9996 09 06 000 9998</p>		
<p>Protection and fixing strip* for 20 mm shell housing</p> <p>Single fixing fits female connectors and I element crimp</p>	<p>09 06 001 9909</p>		

Shell housings

20
-
22

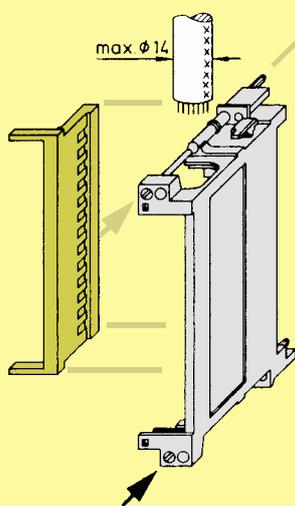
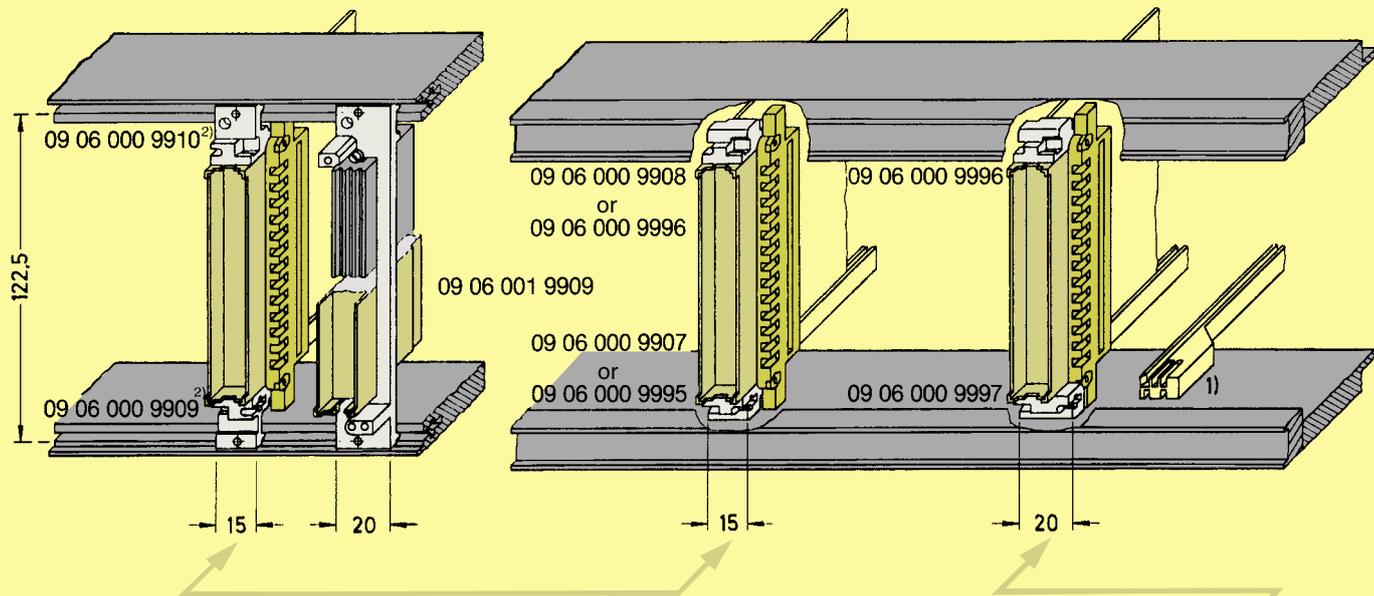
* Fits D 20/2 and D 20/4
¹⁾ Specific coding between the fixing bracket and the pcb guiding rail.
 The guiding rail and corresponding coding pins are not scope of delivery

Mounting examples

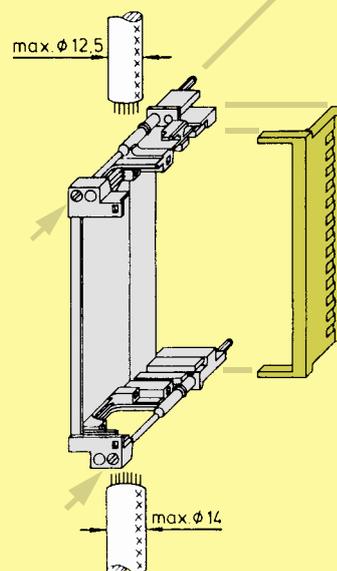
Dimensions in mm

Single fixing

Multiple fixing



Mounting example A²⁾
max. cable entry to the top



Mounting example B
max. cable entry to the bottom

Separate accessories for housings

Fitting female connectors

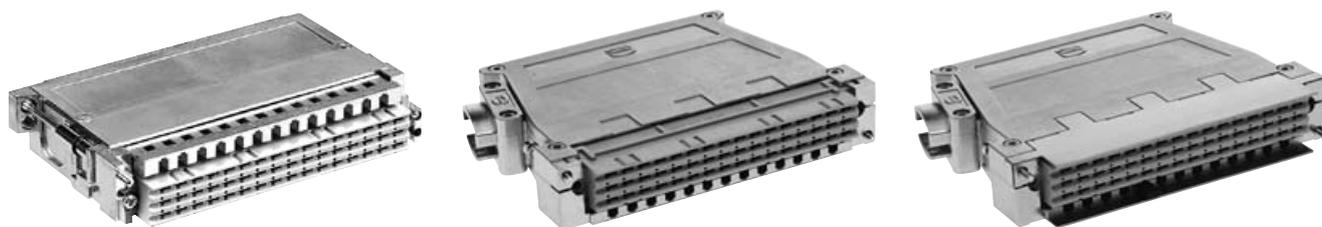
Fitting male connectors

Fixing brackets

Housing parts supplied

¹⁾ Specific coding between the fixing bracket and the pcb guiding rail

²⁾ Max. cable entry ($\phi 14$ mm) from the bottom with fixing brackets 09 06 901 9924/...9925 possible. See page 20.29.



EMC with HARTING connectors

HARTING offers metallised D 20 housings and full metal housings for EMC connectors according to IEC 60603-2. Its strong EMI characteristics and metallised fixing elements offers optimal shielding and grounding.

The connection of the cable braid to different types of connector housings, as well as the influence of the connector itself on EMC characteristics of an instrument application, were analysed in regard to **the shielding effectiveness against electromagnetic radiation**. The shielded signal data lines of a railway application were carried via two eurocard pcb's installed into a 19"-rack. The fixing of the cable braid was realised with different HARTING D 20 housings.

The application including the connectors was then exposed to RF signals, transient bursts and electrostatic discharges.

The standard plastic housings showed minimal EMC performance. The EMC performance of metallised and full metal housings showed significant improvements.

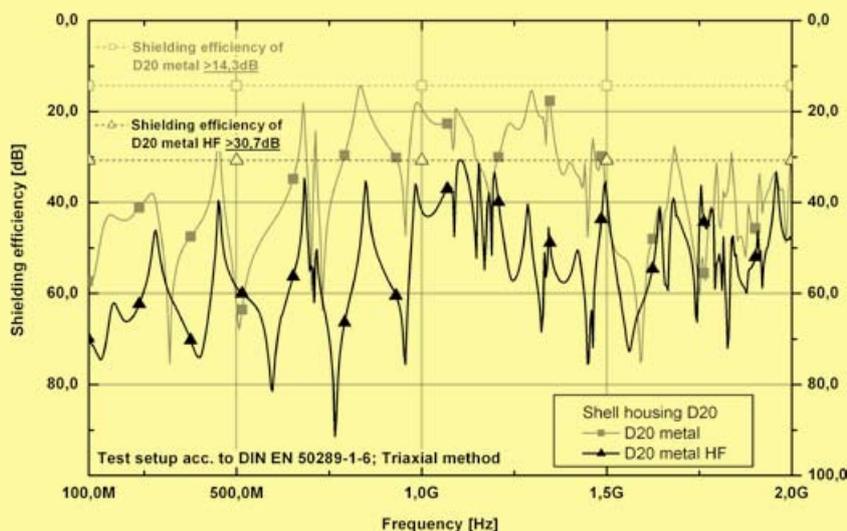
One advantage of metallised housings is their reduced weight (40 grams compared to 180 grams of a full metal housing). Therefore, minimal interference is applied to the pcb in applications where strong vibration is occurring. The HARTING housings are comparatively light through the use of metallised plastic.

The main advantages of a full metal housing are improved cable braid fixing, easy mounting and robustness.

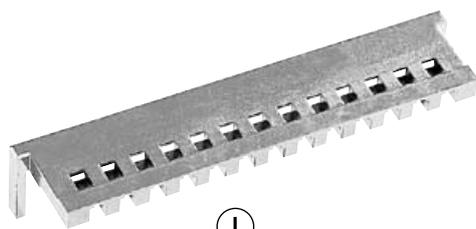
In general, one should keep in mind that an unshielded cable entry leads to loss of the shielding against electromagnetic interference.

“A high-resistance interruption of the cable shield (e.g. by using “pigtailed” via twisted stranded wires of the cable shield) may affect the EMC performance and therefore cause unacceptable effects to the electromagnetic environment.”

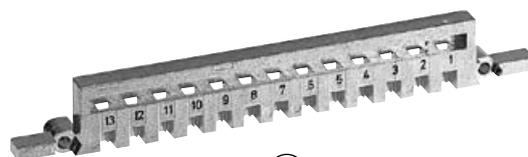
These housings are applied in electronic installations of the railway vehicles of the GERMAN RAILWAY. They are also recommended for stationary installations of the GERMAN RAILWAY (see norm BN 74016, part 1 of December 1989).



Shell housing D 20 metallised



Ⓛ



Ⓜ

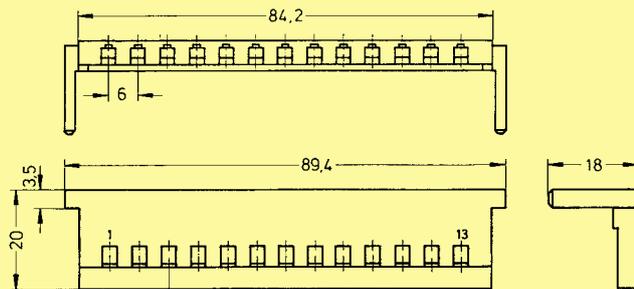
Coding

Identification Part No. Drawing Dimensions in mm

Metallised code comb for shell housing³⁾
(can also be used as blanking cover)

Ⓛ

09 06 900 9984



Code pin³⁾

09 06 001 9905¹⁾

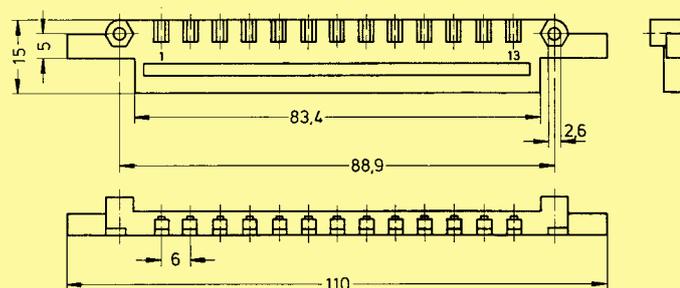
¹⁾ Order 13 pieces per code comb



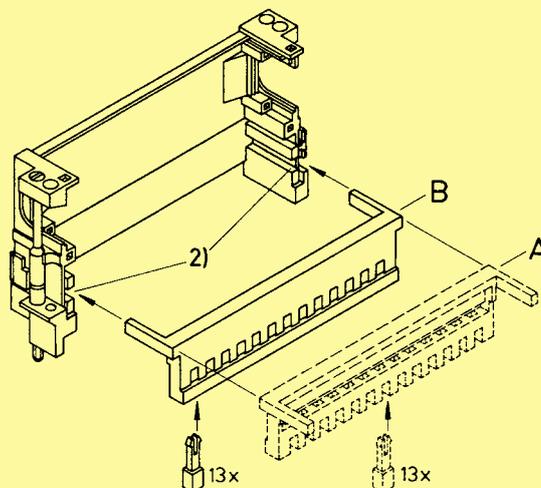
Metallised code comb for male connector³⁾

Ⓜ

09 06 900 9985



Mounting possibilities for the code comb in shell housing D 20/2 metallised



²⁾ Use the lower slot when coding the male connector with fixing brackets

Mounting example **A** max. cable entry \varnothing 14 mm to the top, see page 20.23

Mounting example **B** max. cable entry \varnothing 14 mm to the bottom, see page 20.23

³⁾ Fits D 20/2 and D 20/4 metallised

Identification	Part No.	Drawing	Dimensions in mm
<p>Mounting possibilities for coding at the male connector with fixing brackets</p>			
<p>Fixing brackets B metallised for male connectors* for 19" racks according to DIN EN 60297, part 3-101</p> <p>Single fixing* without nut</p> <p>with nut M 2.5 DIN EN ISO 4036</p>	<p>left 09 06 900 9909 right 09 06 900 9910</p> <p>left 09 06 901 9934 right 09 06 901 9935</p>		
<p>Multiple fixing* without coding at fixing bracket without nut</p> <p>without coding at fixing bracket with nut M 2.5 DIN 562</p> <p>with coding at fixing bracket¹⁾ with nut M 2.5 DIN 562</p>	<p>left 09 06 900 9907 right 09 06 900 9908</p> <p>left 09 06 900 9966 right 09 06 900 9967</p> <p>left 15 mm 09 06 900 9995 20 mm 09 06 900 9997</p> <p>right 15 mm 09 06 900 9996</p>		
<p>Protection and fixing* strip for 20 mm shell housing Single fixing fits female connectors and I element crimp</p>	<p>09 06 001 9909</p>		

* Fits D 20/2 and D 20/4 metallised

¹⁾ Specific coding between the fixing bracket and pcb guiding rail

For applications where robust, high density, splash-proof connectors are required, e.g. in the automated control and industrial processing systems, HARTING have combined the proven reliability of DIN 41 612 connectors with standard Han® 24 B heavy duty hoods and housings, to bring forward a connector system with up to 96 ways and various contact plating thicknesses to suit the individual requirements.

Advantages

- The combination enhances design flexibility, as it permits an identical wiring interface between the standard 19" racking systems and the peripheral equipment.
- Simplified stock-holding, identical operating tools.

Inserts

Female	2 x 48 way type F female connectors with crimp contact elements see chapter 02
Male	2 x 48 way type F interface connectors I with crimp contact elements see chapter 02

Hoods and housings

see catalogue "Heavy Duty Han® Connectors"

chapter 30
size 24 B

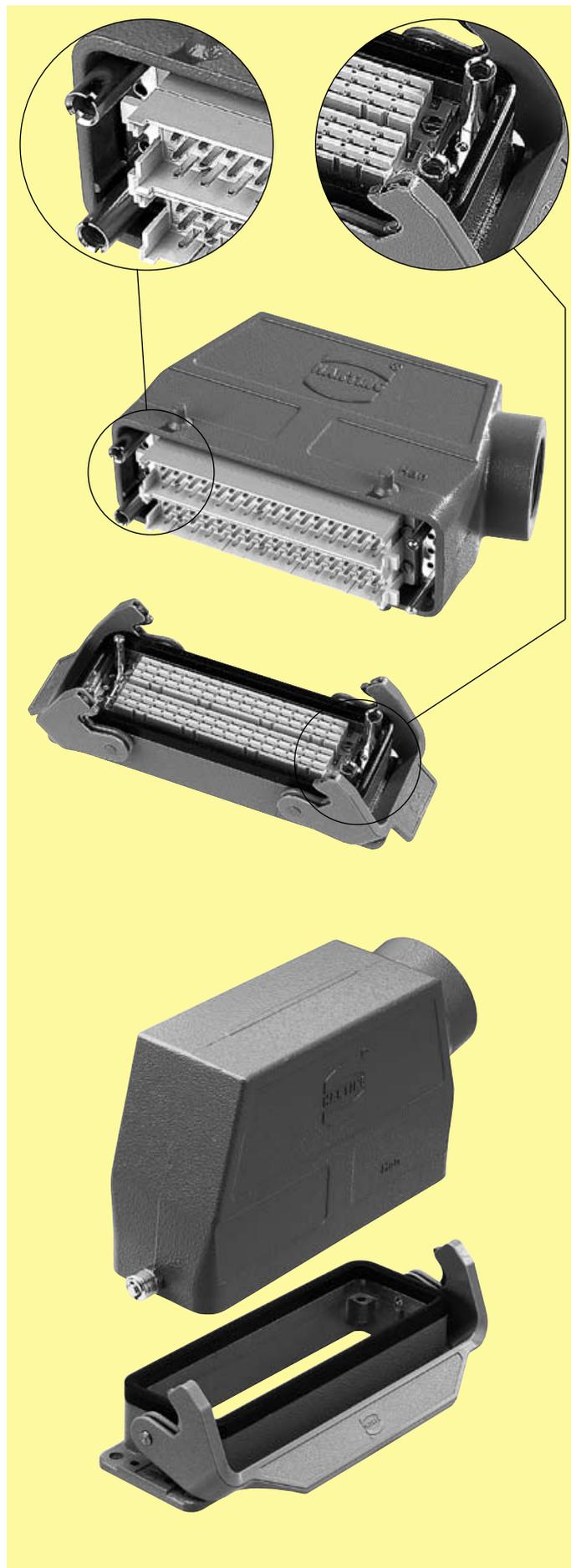
Degree of protection for hoods and housings: IP 65

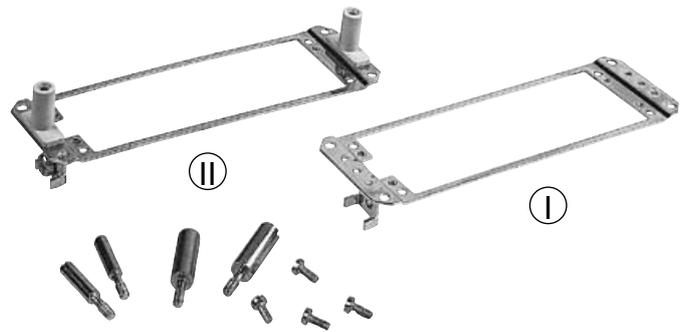
Retaining frames

For fixing the inserts into the housing.

Alternative versions with pre-mating contacts and ground termination.

If the working voltages are in excess of 42 V (50 V) it is essential to use retaining frames which have pre-mating ground contacts.





Identification

Part No.

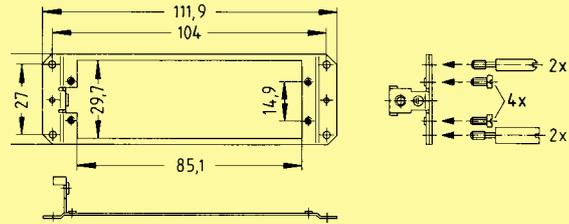
Drawing

Dimensions in mm

Retaining frame without contact elements

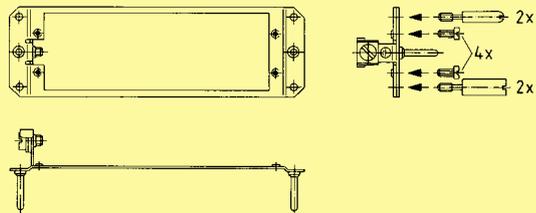
Ⓘ

09 06 001 9904



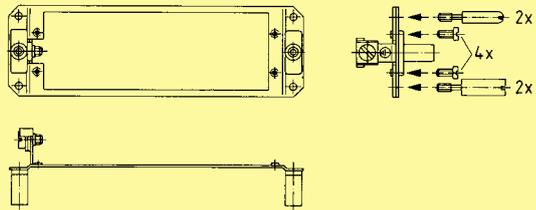
Retaining frame with 2 contact pins and ground termination

09 06 001 9902



Retaining frame with 2 contact sockets and ground termination

09 06 001 9903



Ⓜ

Each retaining frame is supplied with 4 fixing screws for mounting the inserts and with 2 guide pins and sockets that provide mechanical protection for the contacts during mating and disconnection. These can also be used as a coding system to prevent cross plugging of adjacent connectors.

Mounting example

Connectors in the retaining frame with contact sockets

