

Shell housings and accessories

Page

Summary of shell housings and accessories **20.02**

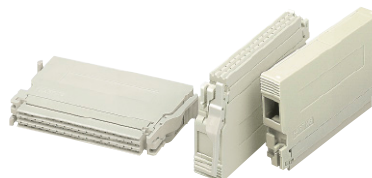
Shell housing C **20.04**



Shell housing 2C, 3C **20.08**

Shell housing A **20.10**

Shell housing B **20.12**



Shell housing D 15 **20.16**

Open hood G **20.19**



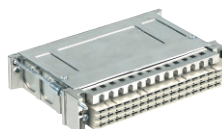
Junction element O **20.19**

Shell housings D 20/2 and D 20/4 **20.20**

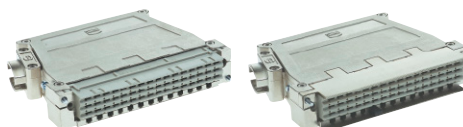


EMC housing **20.26**

Shell housings D 20/2 and D 20/4 metallised. **20.27**



Shell housings D 20 metal **20.30**



Electronic connectors in Heavy Duty Housings **20.33**

Summary shell housings and accessories



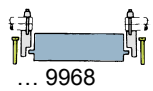
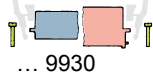
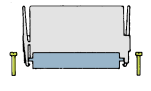

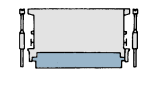

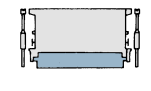

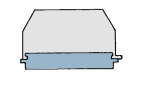






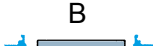
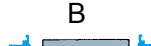
Appropriate connectors in shell housings	Types B, C, D, E, har-bus® 64	Types 2C, 3C	Type F	Types F, H, MH	Types E, F, H, MH
Check list: How to order shell housings and accessories. The Part number is stated.					
Shell housings	C 09 02 064 0501 09 02 064 0502 09 03 096 0501 09 05 048 0501	2C, 3C 09 23 048 0501 09 25 030 0501	A 09 06 048 0501 09 06 048 0402	B 09 06 048 0503 09 06 048 0504 09 06 048 0505	G 09 06 000 9957
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	
Locking lever <small>Order 2 pieces, in some cases each with different Part Nos. for left and right hand</small>	09 02 000 9902 09 02 000 9903	Supplied with the shell housing	Supplied with the shell housing	09 06 000 9913 09 06 000 9919	
Locking screws <small>Order 2 sets</small>	for fixing elements with male connectors 09 02 000 9909 🔩 M 2.5 x 16 🌀 M 2.5	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
	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
Fixing brackets for 19" racks for male connectors	C 	C 	A 	B 	B
Multiple fixing left	09 02 000 9919	09 02 000 9919	09 06 000 9901	09 06 000 9907 09 06 000 9966	09 06 000 9907 09 06 000 9966
Multiple fixing right	09 02 000 9920	09 02 000 9920	09 06 000 9902	09 06 000 9908 09 06 000 9967	09 06 000 9908 09 06 000 9967
Single fixing left	09 02 000 9921	09 02 000 9921	09 06 000 9905	09 06 000 9909 09 06 001 9934	09 06 000 9909 09 06 001 9934
Single fixing right	09 02 000 9922	09 02 000 9922	09 06 000 9906	09 06 000 9910 09 06 001 9935	09 06 000 9910 09 06 001 9935
for female connectors				B 	
Multiple fixing left				09 06 000 9933	
Multiple fixing right				09 06 000 9933	
Fixing brackets for angled male connectors on pcb	C 	C 			
left	09 02 000 9926	09 02 000 9926			
right	09 02 000 9927	09 02 000 9927			
Fixing brackets for inverse male connectors on pcb	R 	R 			
R 1	09 02 000 9953	09 02 000 9953			
R 32	09 02 000 9954	09 02 000 9954			
Distance fixing brackets for piggyback connectors					
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
Protection strip for 20 mm shell housing				09 06 000 9929	
Protection and fixing strip for 20 mm shell housing				09 06 001 9909	

Female connectors Male connectors



Detailed system description see chapter 00

Summary shell housings and accessories



Appropriate connectors in shell housings	Types F, H, MH	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 number is stated.</p>	 ... 9968  ... 9930	 	 	 	 
Shell housings	<p>O</p> <p>09 06 000 9968 09 06 000 9930°</p> <p>° order 2 pieces</p>	<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			<p>09 06 000 9988 09 06 000 9989</p>	<p>09 06 900 9988</p>	
Insert for LED			<p>09 06 000 9986 09 06 000 9987</p>	<p>09 06 900 9986 09 06 900 9987</p>	
<p>Locking lever</p> <p>Order 2 pieces, in some cases each with different Part Nos. for left and right hand</p>		<p>Supplied with the shell housing</p>			
<p>Locking screws</p> <p>Order 2 sets for fixing elements with male connectors for interface connectors I</p>	<p>09 06 000 9926</p> <p>⚙ M 2.5 x 20 ⚙ M 2.5</p>	<p>09 06 000 9926</p> <p>⚙ M 2.5 x 16 ⚙ M 2.5</p>	<p>Supplied with the shell housing</p>	<p>Supplied with the shell housing</p>	<p>Supplied with the shell housing</p>
<p>Shroud</p> <p>for screw fixing with interface connector I</p>	—	—	<p>09 06 001 9964</p>	<p>09 06 001 9964</p>	—
<p>Fixing brackets</p> <p>for 19" racks for male connectors</p>	<p>B</p> 	<p>B</p> 	<p>B</p> 	<p>B</p> 	<p>B</p> 
<p>Multiple fixing</p> <p>left</p>	<p>09 06 000 9907 09 06 000 9966</p>	<p>09 06 000 9907 09 06 000 9966</p>	<p>09 06 000 9907 09 06 000 9966 09 06 000 9995 09 06 000 9997</p>	<p>09 06 900 9907 09 06 900 9966 09 06 900 9995 09 06 900 9997</p>	<p>09 06 900 9997</p>
<p>right</p>	<p>09 06 000 9908 09 06 000 9967</p>	<p>09 06 000 9908 09 06 000 9967</p>	<p>09 06 000 9908 09 06 000 9967 09 06 000 9996 09 06 000 9998</p>	<p>09 06 900 9908 09 06 900 9967 09 06 900 9996</p>	<p>09 06 900 9996</p>
<p>Single fixing</p> <p>left</p>	<p>09 06 000 9909 09 06 001 9934</p>	<p>09 06 000 9909 09 06 001 9934</p>	<p>09 06 000 9909 09 06 001 9934</p>	<p>09 06 900 9909 09 06 901 9934</p>	<p>09 06 800 9943 09 06 901 9924</p>
<p>right</p>	<p>09 06 000 9910 09 06 001 9935</p>	<p>09 06 000 9910 09 06 001 9935</p>	<p>09 06 000 9910 09 06 001 9935</p>	<p>09 06 900 9910 09 06 901 9935</p>	<p>09 06 800 9944 09 06 901 9925</p>
<p>for female connectors</p>	<p>B</p> 	<p>B</p> 			
<p>Multiple fixing</p> <p>left right</p>	<p>only ... 9930</p> <p>09 06 000 9933 09 06 000 9933</p>	<p>09 06 000 9933 09 06 000 9933</p>			
<p>Protection and fixing strip for 20 mm shell housing</p>			<p>09 06 001 9909</p>	<p>09 06 901 9909</p>	

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 3x
- a) BZ 2.9 x 6.5
DIN ISO 1482 3x
- b), c), d) BZ 2.9 x 13
DIN ISO 1483 3x

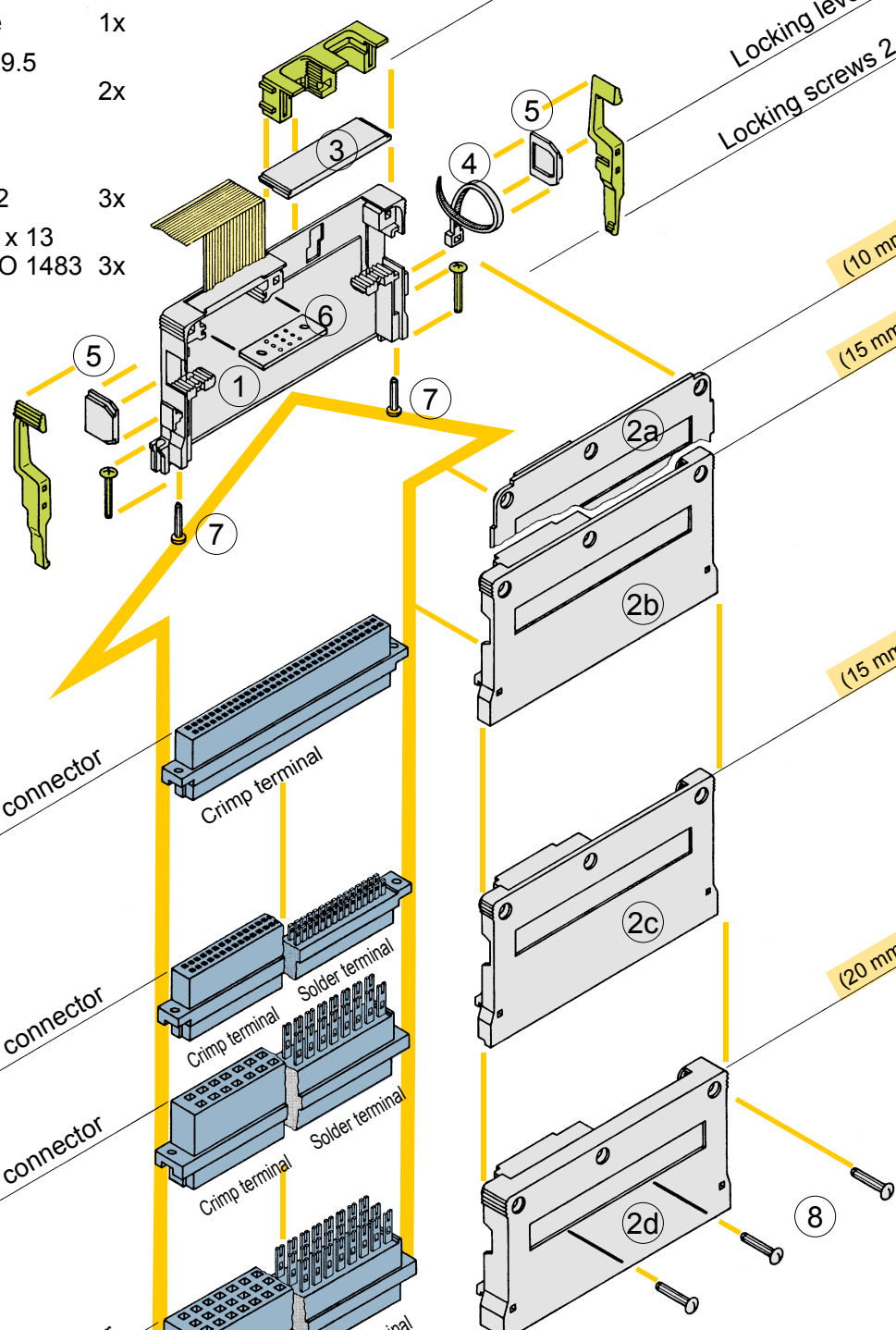
Round cable insert

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

Crimp terminal

Type C female connector

Crimp terminal Solder terminal

Type D female connector

Crimp terminal Solder terminal

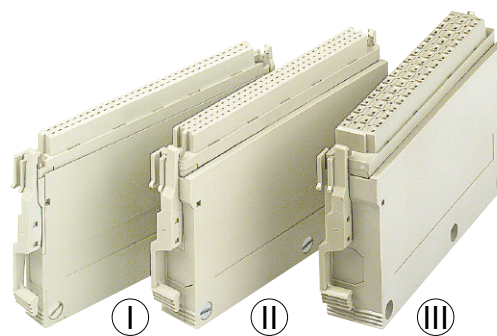
Type E female connector
har-bus® 64 female connector

Crimp terminal Solder terminal

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

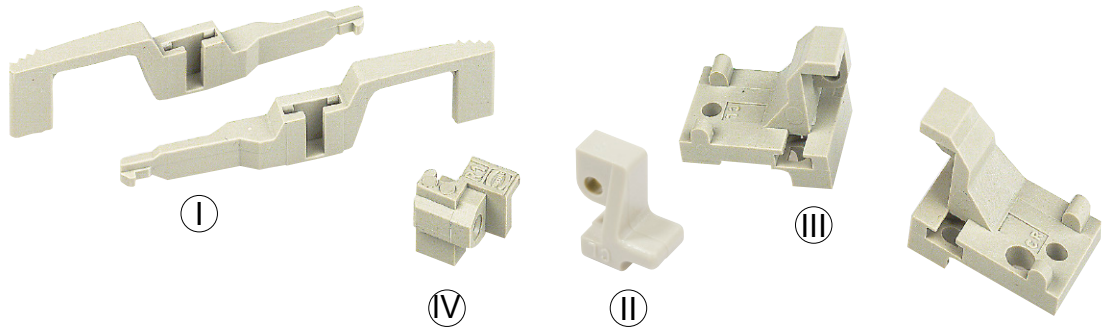
Shell housings

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



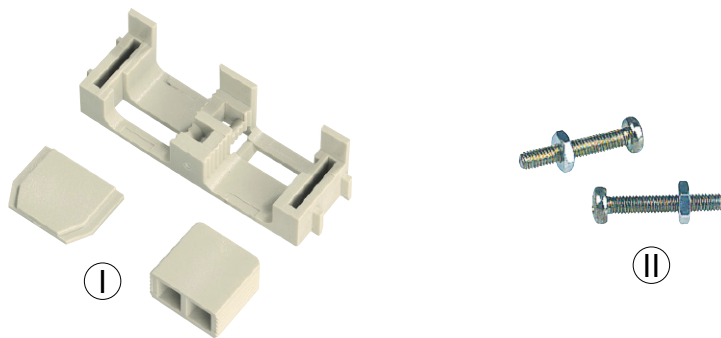
Identification	Part number	Drawing	Dimensions in mm
Shell housing C for female connectors type B I	10 mm 09 02 064 0501		
	15 mm 09 02 064 0502		
Shell housing C for female connectors types C, D II	15 mm 09 03 096 0501		
Shell housing C for female connectors type E, har-bus® 64 III	20 mm 09 05 048 0501		
			1) Possible access for flat cable (18 x Ø 1.27). Remove the blanking piece.

Shell housings



Accessories

Identification	Part number	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 Screw DIN ISO 7049 M 2.2 x 9.5	R 1 09 02 000 9953 R 32 09 02 000 9954 09 06 001 9974		See application example 4, chapter 01



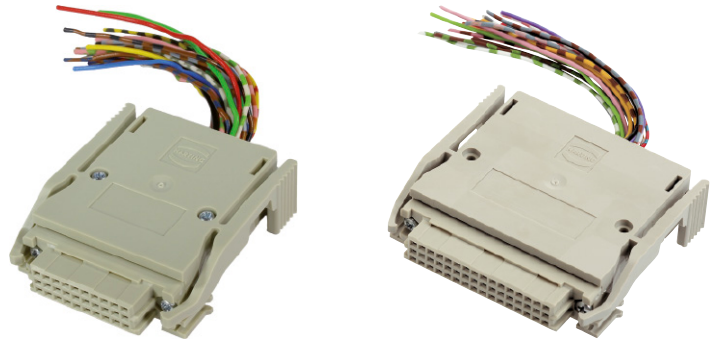
Accessories

Identification	Part number	Drawing	Dimensions in mm
Fixing brackets C for angled male connectors on pcb without fixing possibility in 19" racks	left 09 02 000 9926 ^{f)} right 09 02 000 9927 ^{f)}		
Round cable insert 2 x \varnothing 6.5 for shell housing C 09 02 064 0501 Supplied with: Round cable insert 1x Blinding piece A 1x Blinding piece B 1x Cable tie 1x	09 02 000 9910 ^{f)}		6,5 12
Round cable insert 2 x \varnothing 11.5 (I) for shell housings C 09 02 064 0502 09 03 096 0501 09 05 048 0501 Supplied with: Round cable insert 1x Blinding piece A 1x Blinding piece B 1x Cable tie 1x	09 02 000 9911 ^{f)}		11,5 12
Locking screws (II)	09 02 000 9909 ¹⁾		

¹⁾ Order 2 pieces for one shell housing

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

Shell housing 2C, 3C

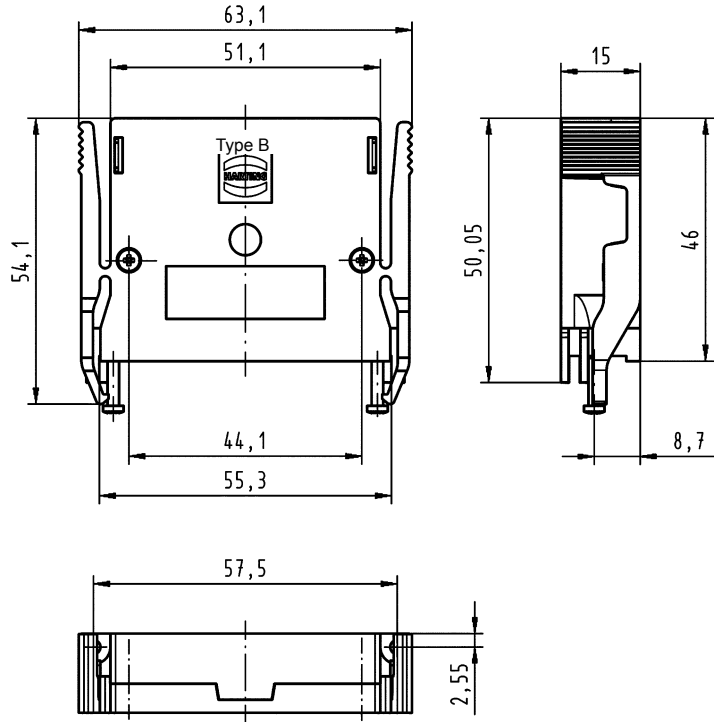


Identification Part number Drawing Dimensions in mm

Shell housing 2C
for female connectors
type 2C

09 23 048 0501

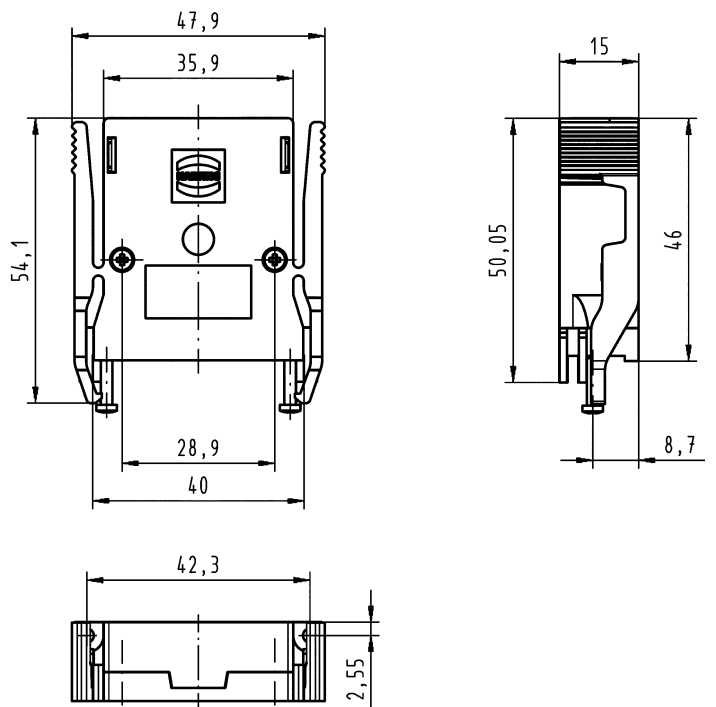
Supplied with:
Shell 1x
Cover with 2 locking
levers 1x
Cable tie 1x
Screw 2.2 x 9.5
4x (09 06 001 9974)



Shell housing 3C
for female connectors
type 3C

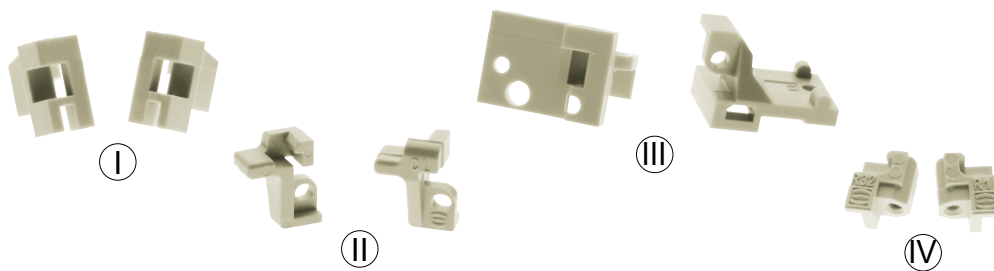
09 25 030 0501

Supplied with:
Shell 1x
Cover with 2 locking
levers 1x
Cable tie 1x
Screw 2.2 x 9.5
4x (09 06 001 9974)



Shell housings

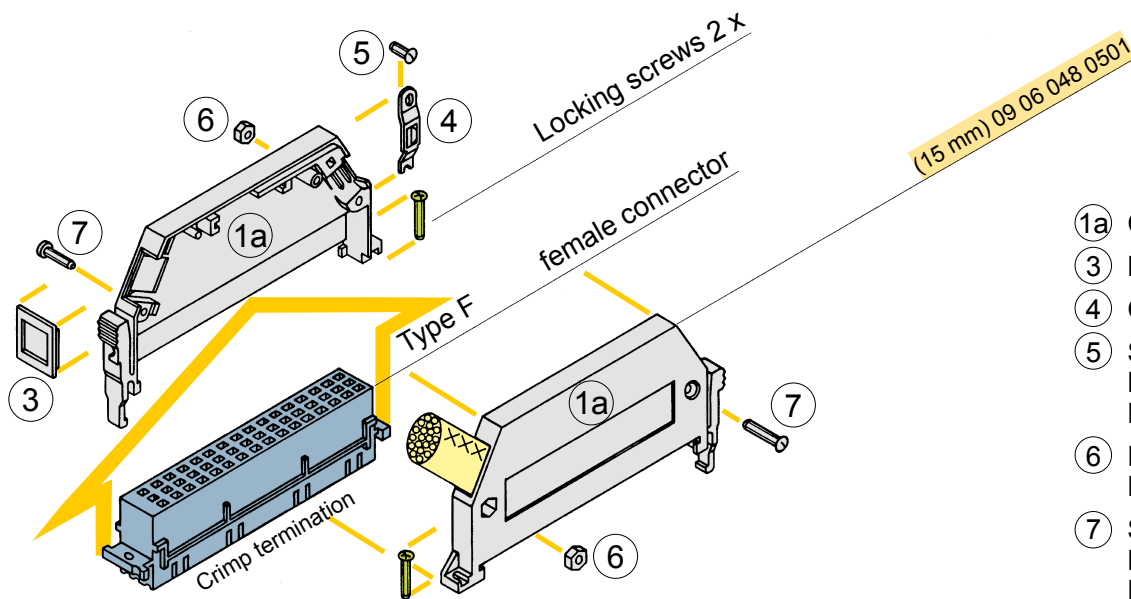
20
08



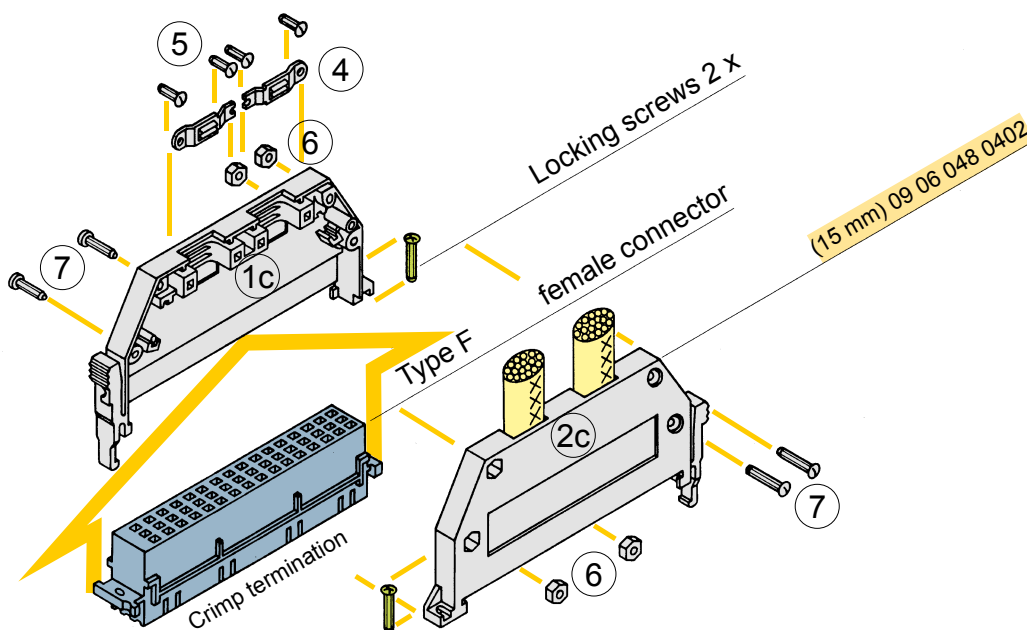
Accessories

Identification	Part number	Drawing	Dimensions in mm									
Fixing brackets C for angled male connectors on pcb without fixing possibility in 19" racks I	left 09 02 000 9926 right 09 02 000 9927		<table border="1"> <thead> <tr> <th></th> <th>a</th> </tr> </thead> <tbody> <tr> <td>2C</td> <td>63.7</td> </tr> <tr> <td>3C</td> <td>48.4</td> </tr> </tbody> </table>		a	2C	63.7	3C	48.4			
	a											
2C	63.7											
3C	48.4											
Fixing brackets C for male connectors for 19" racks according to DIN EN 60 297, 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		<table border="1"> <thead> <tr> <th></th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>2C</td> <td>82.3</td> <td>88.4</td> </tr> <tr> <td>3C</td> <td>67.1</td> <td>73.2</td> </tr> </tbody> </table>		b	c	2C	82.3	88.4	3C	67.1	73.2
	b	c										
2C	82.3	88.4										
3C	67.1	73.2										
Fixing brackets R for inverse male connectors on pcb's IV Screw DIN ISO 7049 M2.2 x 9.5	R 1 09 02 000 9953 R 32 09 02 000 9954 09 06 001 9974		<table border="1"> <thead> <tr> <th></th> <th>d</th> </tr> </thead> <tbody> <tr> <td>2C</td> <td>64.1</td> </tr> <tr> <td>3C</td> <td>48.9</td> </tr> </tbody> </table>		d	2C	64.1	3C	48.9			
	d											
2C	64.1											
3C	48.9											

Shell housings



- ①a Casing shell 2x
- ③ Blinding piece 1x
- ④ Cable clamp 1x
- ⑤ Screw BZ 2.9 x 9.5 DIN ISO 1481 1x
- ⑥ Hexagonal nut M3 DIN EN ISO 4032 2x
- ⑦ Screw M3 x 12 DIN EN ISO 1207 2x

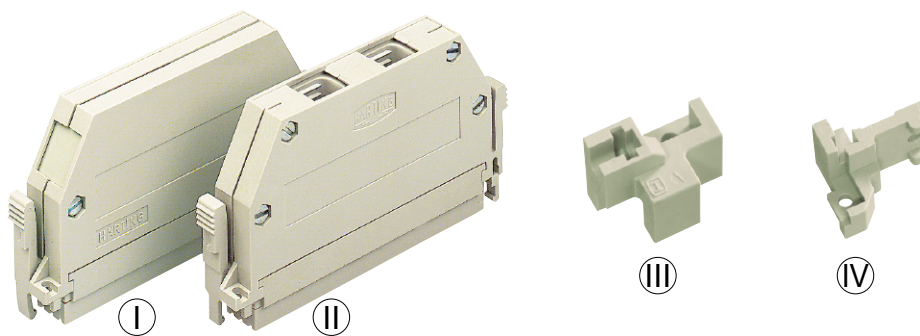


- ①c Shell 1x
- ②c Cover 1x
- ④ Cable clamp 2x
- ⑤ Screw BZ 2.9 x 9.5 DIN ISO 1481 4x
- ⑥ Hexagonal nut M3 DIN EN ISO 4032 4x
- ⑦ Screw M3 x 12 DIN EN ISO 1207 4x

Shell housings

- Separate accessories for housings
- Fitting female connectors
- Cable access
- Housing parts supplied

Shell housing A for type F



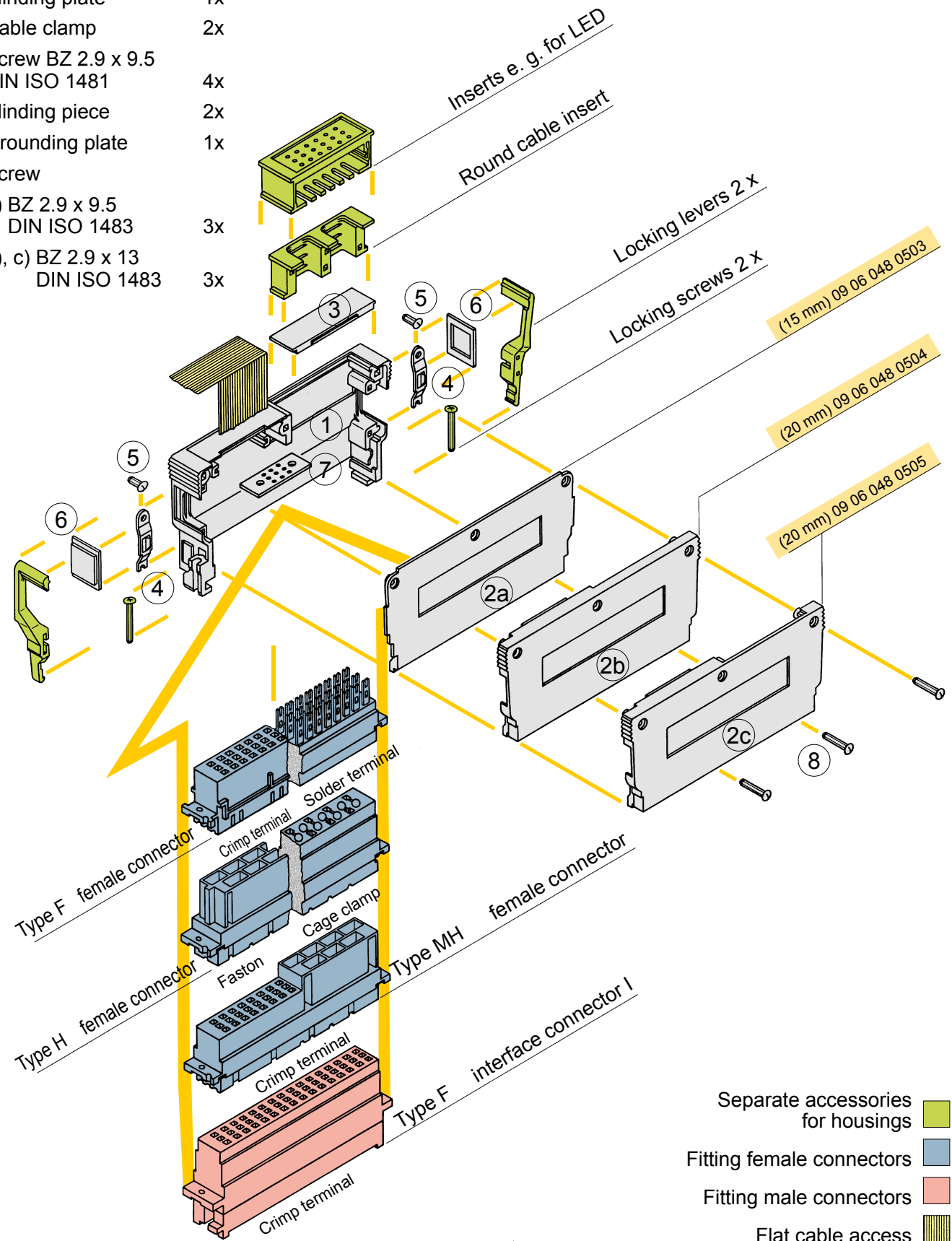
Identification	Part number	Drawing	Dimensions in mm
Shell housing A Side entry I	15 mm 09 06 048 0501 ^{f)}		
Top entry II	15 mm 09 06 048 0402 ^{f)}		
Cable clamp incl. screw	09 06 001 9986	1 x ④ + 2 x ⑤ on page 20.10	
Fixing brackets A for male connectors for 19" racks according to DIN EN 60 297, part 3-101 Multiple fixing III	left 09 06 000 9901 ^{f)} right 09 06 000 9902 ^{f)}		
Single fixing IV	left 09 06 000 9905 ^{f)} right 09 06 000 9906 ^{f)}		

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

Shell housing B for types F, H and MH

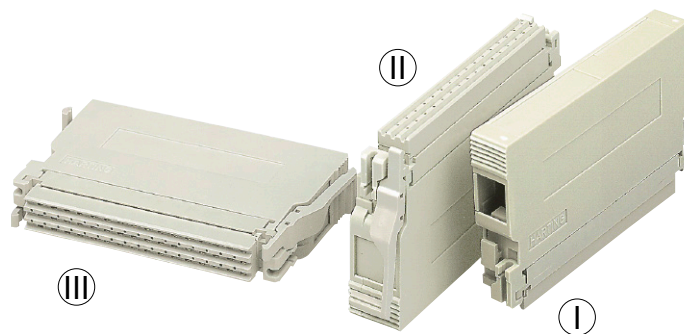


- ① Shell 1x
- ② Cover 1x
- ③ Blinding plate 1x
- ④ Cable clamp 2x
- ⑤ Screw BZ 2.9 x 9.5
DIN ISO 1481 4x
- ⑥ Blinding piece 2x
- ⑦ Grounding plate 1x
- ⑧ Screw
 - a) BZ 2.9 x 9.5
DIN ISO 1483 3x
 - b), c) BZ 2.9 x 13
DIN ISO 1483 3x



Shell housings

Shell housing B for types F, H and MH

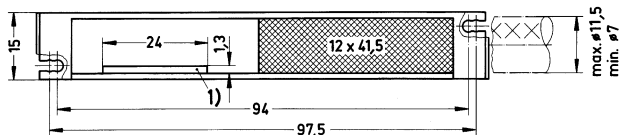


Identification Part number Drawing Dimensions in mm

Shell housing B

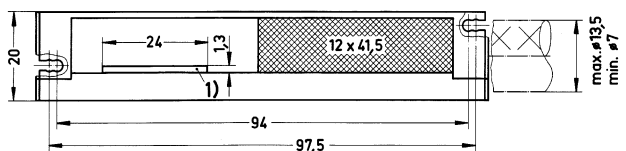
I

15 mm
09 06 048 0503



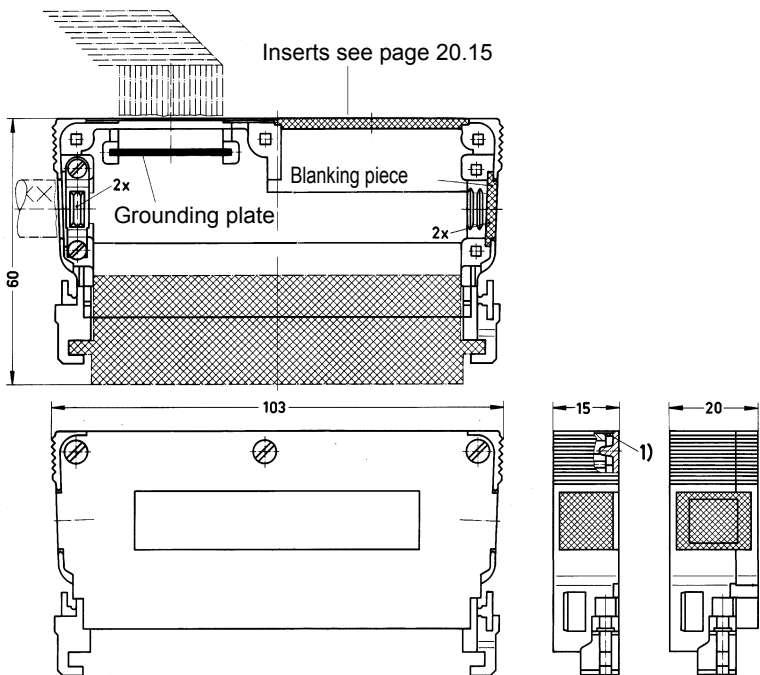
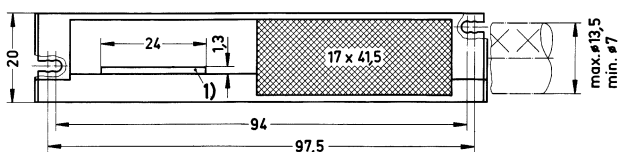
II

20 mm
09 06 048 0504



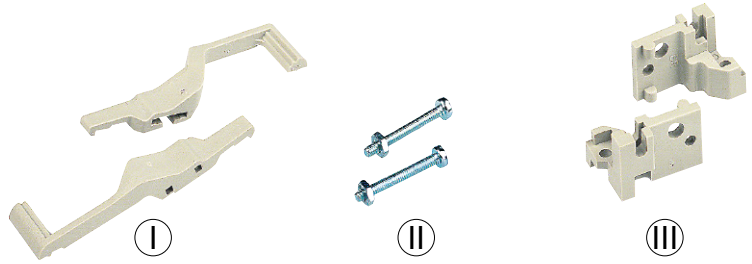
III

20 mm
09 06 048 0505



1) Possible access for flat cable (18 x ø 1.27). Remove the blanking piece

Shell housings

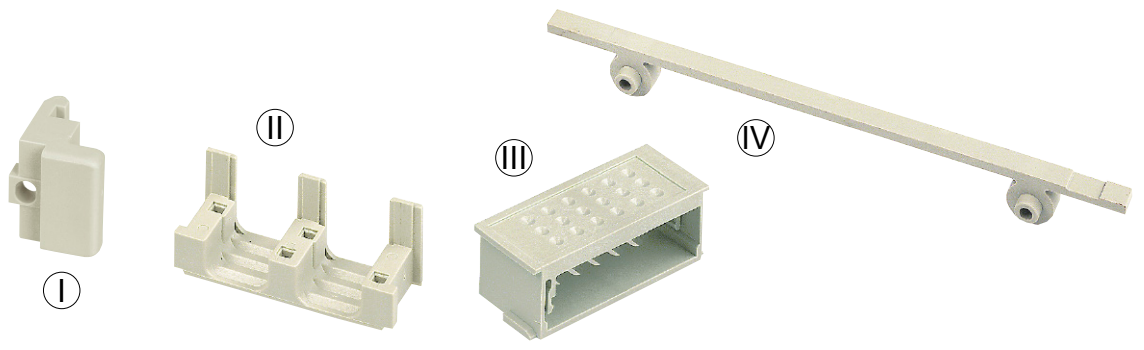


Accessories

Identification	Part number	Drawing	Dimensions in mm
Locking lever for shell housing B 09 06 048 0503 ①	09 06 000 9913 ¹⁾ f)		
09 06 048 0504 09 06 048 0505 left 09 06 000 9913 ^{f)} right 09 06 000 9919 ^{f)}	left 09 06 000 9913 ^{f)} right 09 06 000 9919 ^{f)}		
Locking screws ②	09 06 000 9926 ¹⁾		
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 ^{f)} right 09 06 000 9908 ^{f)}		
with nut M 2.5 DIN 562	left 09 06 000 9966 ^{f)} right 09 06 000 9967 ^{f)}		
Single fixing without nut ③	left 09 06 000 9909 ^{f)} right 09 06 000 9910 ^{f)}		
with nut M 2.5 DIN 562	left 09 06 001 9934 right 09 06 001 9935		

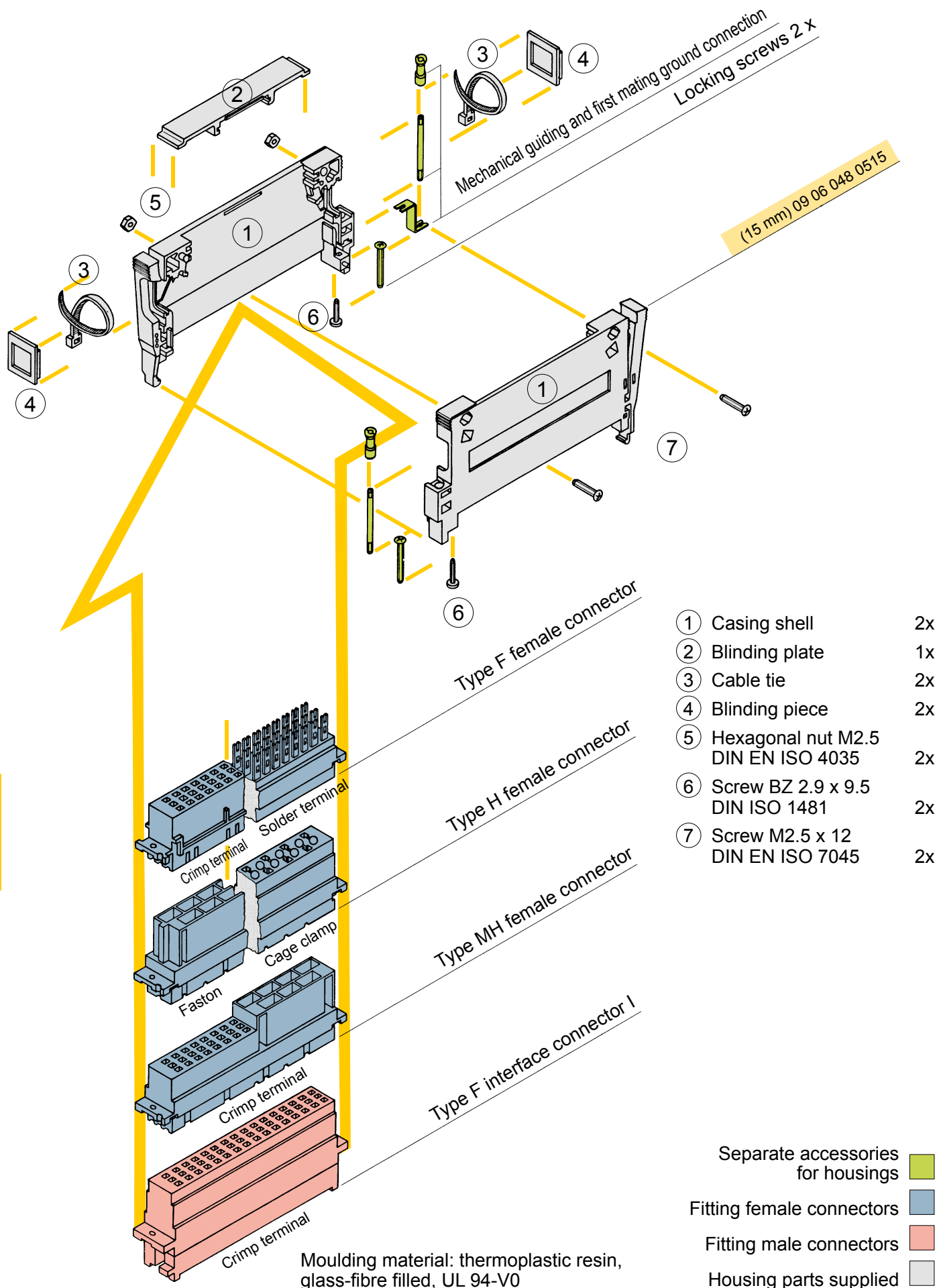
Shell housings

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

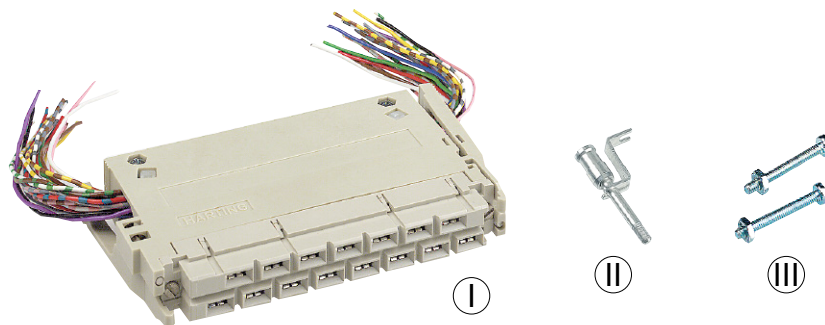


Accessories

Identification	Part number	Drawing	Dimensions in mm
<p>Fixing brackets B for female connectors for 19" racks according to DIN EN 60297, part 3-101</p> <p>Multiple fixing</p> <p>Ⓚ</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 12072²⁾</p> <p>Female connector type F</p> <p>2x 09 06 000 9912</p>	
<p>Round cable insert 2 x \varnothing 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>max. \varnothing 10 min. \varnothing 7</p>	
<p>Round cable insert 2 x \varnothing 12.5</p> <p>Ⓛ</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>max. \varnothing 12.5 min. \varnothing 7</p>	
<p>Insert for LED</p> <p>Ⓜ</p> <p>for shell housing B 09 06 048 0505</p>	09 06 000 9917	<p>35</p> <p>pcb 35.5 x 17 x 1.5</p> <p>508</p> <p>762</p> <p>A-B</p> <p>C-D</p>	
<p>Protection strip</p> <p>Ⓨ</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>128,5</p> <p>88,9±0,1</p> <p>20</p> <p>09 06 000 9909</p> <p>09 06 000 9910</p> <p>Male connector type F</p>	



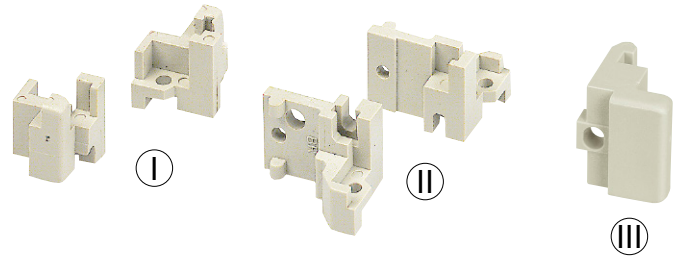
Shell housing D 15 for types F, H and MH



Identification	Part number	Drawing	Dimensions in mm
<p>Shell housing D 15</p> <p>(I)</p>	<p>15 mm 09 06 048 0515¹⁾</p>		
<p>Mechanical guiding and first mating ground connection</p> <p>(II)</p>	<p>09 06 000 9961</p>		
<p>Locking screws</p> <p>(III)</p> <p>¹⁾ Order 2 pieces for one shell housing</p>	<p>09 06 000 9926¹⁾</p>		

Shell housings

¹⁾ Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2



Accessories

Identification Part number 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



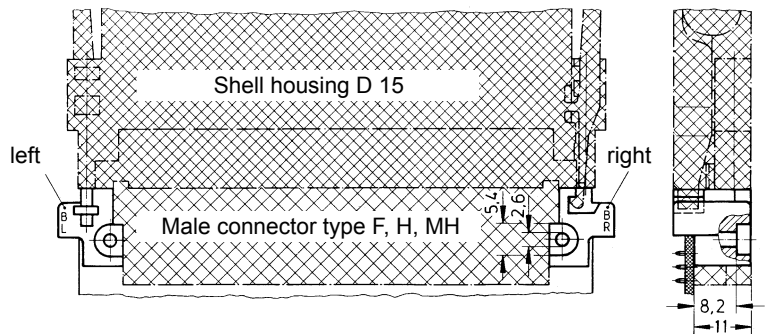
left
09 06 000 9907

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



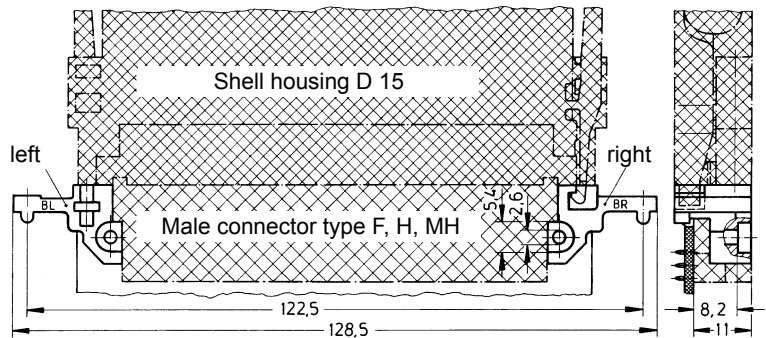
left
09 06 000 9909

right
09 06 000 9910

with nut
M 2.5 DIN 562

left
09 06 001 9934

right
09 06 001 9935

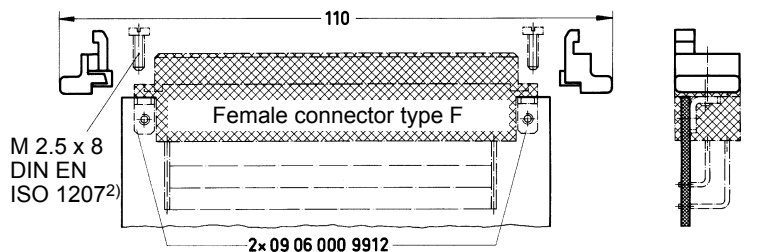


Fixing brackets B for female connectors for 19" racks according to DIN EN 60 297, part 3-101

Multiple fixing

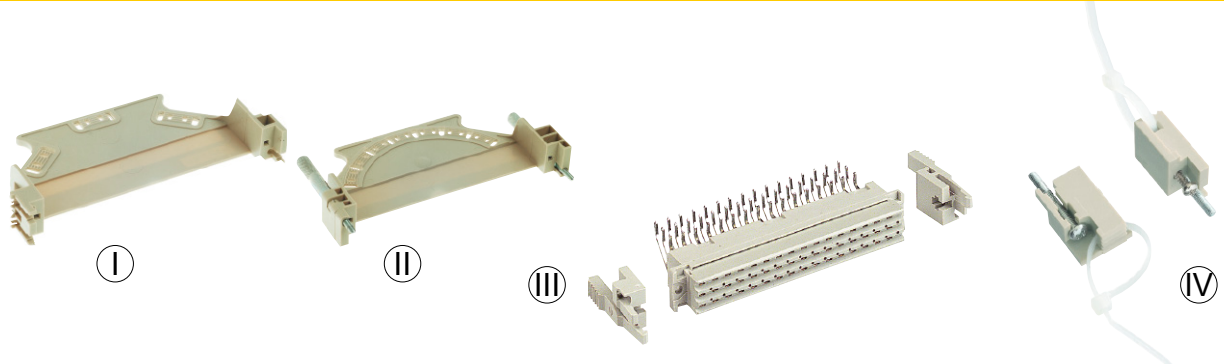


09 06 000 9933¹⁾



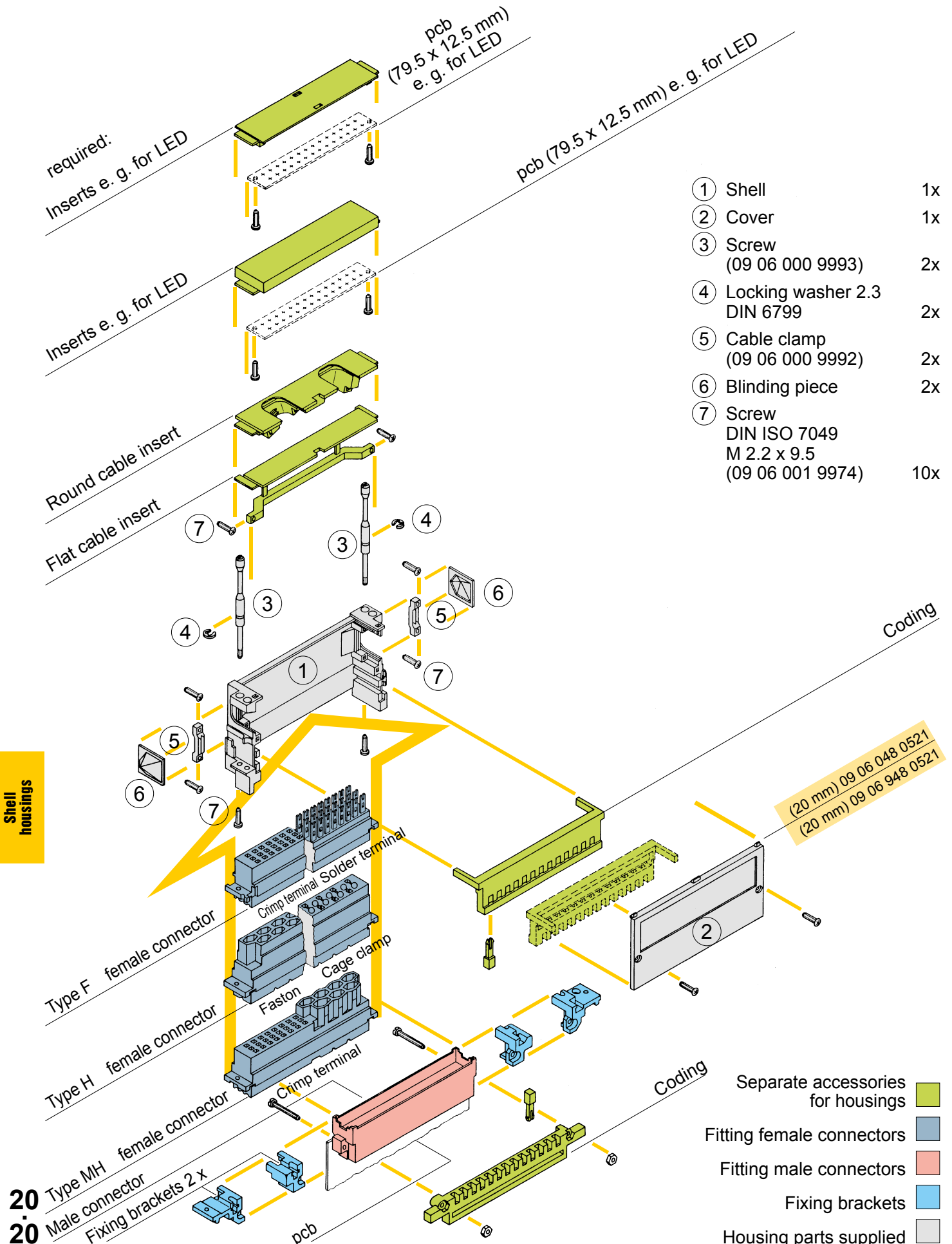
¹⁾ Order 2 pieces for one female connector

²⁾ nut and screw not supplied with fixing brackets



Identification	Part number	Drawing	Dimensions in mm
<p>Open hood G Ⓚ for types E, F, H and MH, for applications Ⓐ Ⓑ Ⓒ</p> <p>Supplied with: Open hood 1x Locking screw 2x (09 06 000 9958) Cable tie 1x Screw 2x</p>	09 06 000 9957	<p>2 x ST 2.2 x 9.5 F-Z; E1U; ISO 7049</p>	
<p>Open hood G Ⓛ for types E, F, H and MH, for application Ⓒ</p> <p>Supplied with: Open hood 1x Pre-assembled, undetachable locking screw 2x Cable tie 1x Screw 2x</p>	09 06 001 9939		
<p>Junction element O for type F Ⓧ</p> <p>Supplied with: Junction element 2x Cable tie 2x Screw 2x Screw M2.5 x 20 2x</p>	09 06 000 9968	<p>2 x ST 2.2 x 9.5 F-Z; E1U; ISO 7049</p>	
<p>Locking lever for type F, H and MH Ⓩ</p> <p>¹⁾ Order 2 pieces for one female connector</p>	09 06 000 9930 ¹⁾		
	09 06 000 9911 ¹⁾		<p>²⁾ nut and screw not supplied with locking levers</p>

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



required:
Inserts e. g. for LED

pcb
(79.5 x 12.5 mm)
e. g. for LED

pcb (79.5 x 12.5 mm) e. g. for LED

Inserts e. g. for LED

Round cable insert
Flat cable insert

- ① Shell 1x
- ② Cover 1x
- ③ Screw (09 06 000 9993) 2x
- ④ Locking washer 2.3 DIN 6799 2x
- ⑤ Cable clamp (09 06 000 9992) 2x
- ⑥ Blinding piece 2x
- ⑦ Screw DIN ISO 7049 M 2.2 x 9.5 (09 06 001 9974) 10x

Coding

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

Shell housings

Type F female connector
Type H female connector
Type MH female connector

Crimp terminal
Solder terminal
Cage clamp
Faston

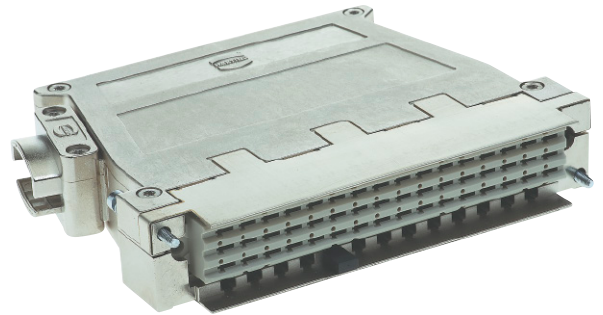
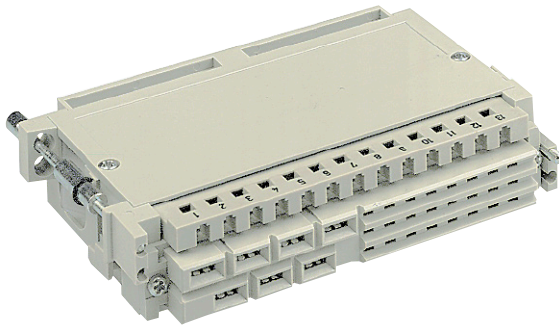
20 Male connector
20 Fixing brackets 2 x

pcb

Coding

- 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:

32 = 32 contacts
48 = 48 contacts

09 06 2__ 853



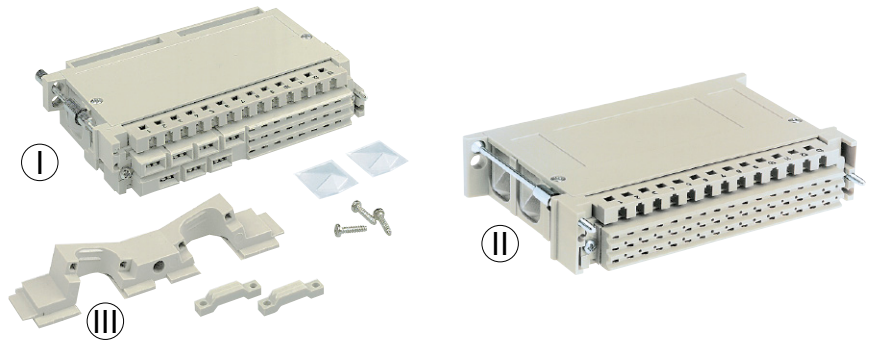
7 = performance level 3
6 = performance level 2
2 = performance level 1

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 number	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	IP20	IP20	IP20	IP20	IP20	IP20

¹⁾ upper temperature limit is +105 °C

Shell housing D 20 for types F, H and MH



Identification Part number Drawing Dimensions in mm

<p>Shell housing D 20/2 Two side cable entries</p> <p>I</p>	<p>20 mm 09 06 048 0521</p>	<p>Order inserts separately</p> <p>Blanking piece 2 x</p>	<p>20</p>
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<p>Shell housing D 20/4 Four side cable entries</p> <p>II</p> <p>Supplied with: Shell 1x Cover 1x Locking screw 2x (09 06 000 9920) Locking washer 2.3 2x Screw BZ 2.2x9.5 12x Blinding piece 3x Cable clamp 2x</p>	<p>20 mm 09 06 048 0522</p>		<p>20</p>
---	---------------------------------	--	-----------

<p>Inserts e. g. for LED*</p> <p>for 55 mm height</p>	<p>09 06 000 9986</p>		
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<p>for 60 mm height</p>	<p>09 06 000 9987</p>		
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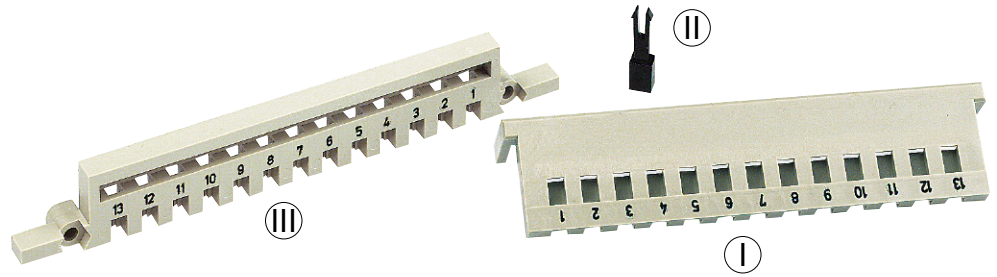
<p>Round cable insert* 2 x ø 11</p> <p>III</p>	<p>09 06 000 9988</p>		
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<p>Flat cable insert*</p>	<p>09 06 000 9989</p>		
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Shell housings

20
-
22

* Fits D 20/2
Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2



Coding

Identification	Part number	Drawing	Dimensions in mm			
<p>Code comb for shell housing³⁾ (can also be used as a blanking cover)</p> <p>Ⓚ</p>	09 06 000 9984 ^{f)}					
<p>Coding pin³⁾</p> <p>Ⓛ</p> <p>1) Order 13 pieces per code comb</p>	09 06 001 9905 ¹⁾					
<p>Code comb for male connectors³⁾</p> <p>Ⓜ</p> <p>short version for a full metal locking lever</p> <p>with nut M2.5</p>	<p>09 06 000 9985^{f)}</p> <p>09 06 001 9985^{f)}</p> <p>09 06 001 9995^{f)}</p>	<table border="1" style="margin-left: 20px;"> <tr><td>X</td></tr> <tr><td>109.55</td></tr> <tr><td>99.75</td></tr> </table>	X	109.55	99.75	
X						
109.55						
99.75						
<p>Mounting possibilities for the code comb in the shell housing D 20/2</p>		<p>2) Use the lower slot when coding the male connector with fixing brackets</p> <p>Mounting example A max. cable entry \varnothing 14 mm to the top, see page 20.25</p> <p>Mounting example B max. cable entry \varnothing 14 mm to the bottom, see page 20.25</p>				

³⁾ Fits D 20/2 and D 20/4

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

Identification	Part number	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 60 297, 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 20 mm</p> <p>15 mm 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>		

²⁾ supplied with fixing

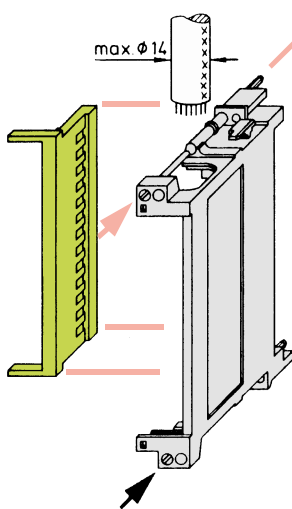
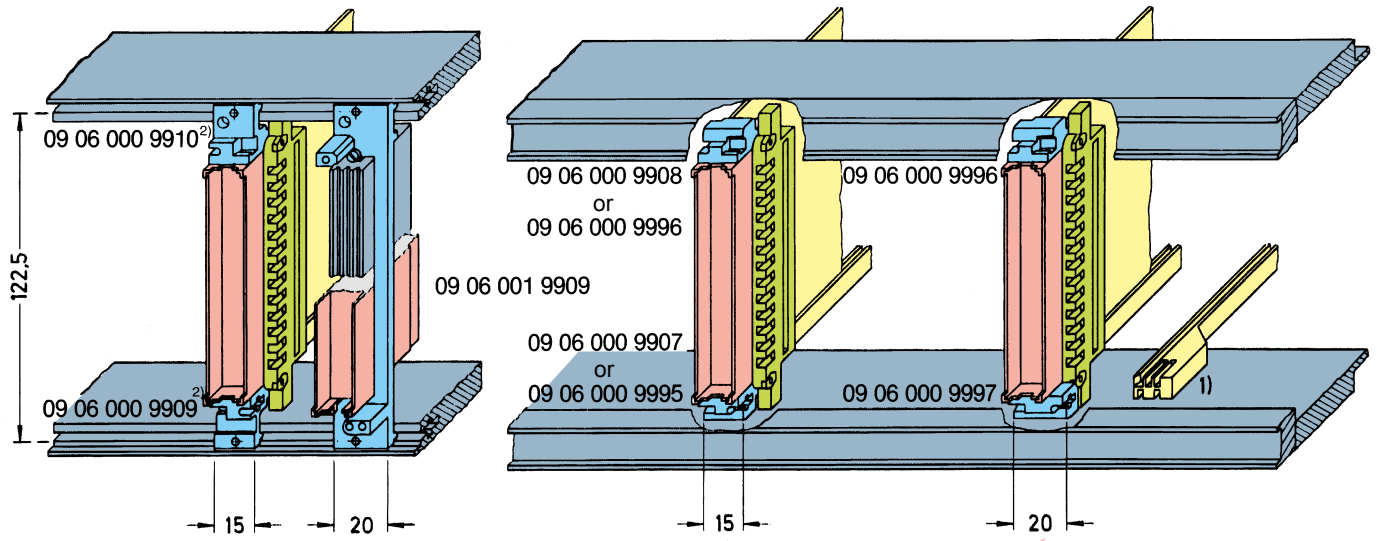
* Fits D 20/2 and D 20/4
¹⁾ Specific coding between the fixing bracket and the pcb guiding rail.
 The guiding rail and corresponding coding pins are not scope of delivery

Mounting examples

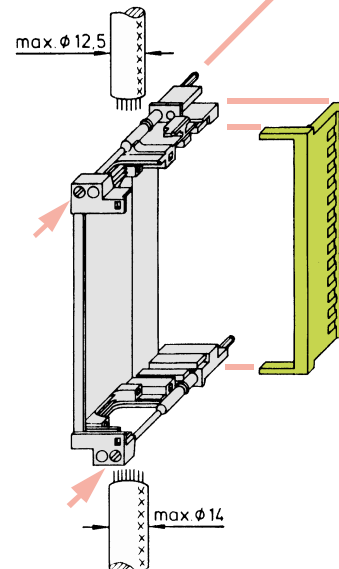
Dimensions in mm

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

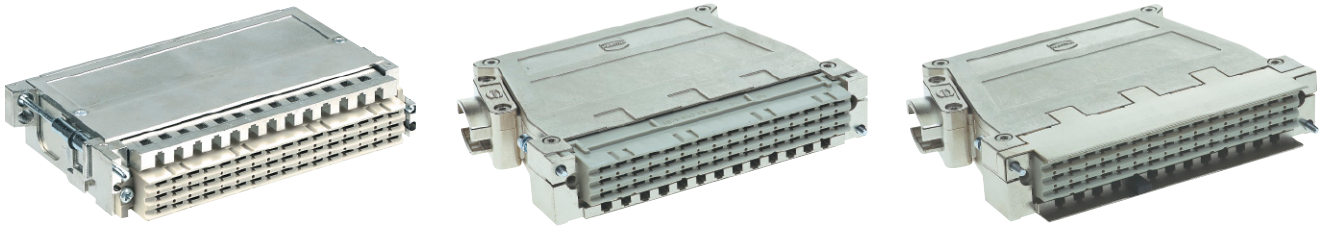
Fitting male connectors

Fixing brackets

Housing parts supplied

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

²⁾ Max. cable entry (ϕ 14 mm) from the bottom with fixing brackets 09 06 901 9924/...9925 possible. See page 20.32.



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.

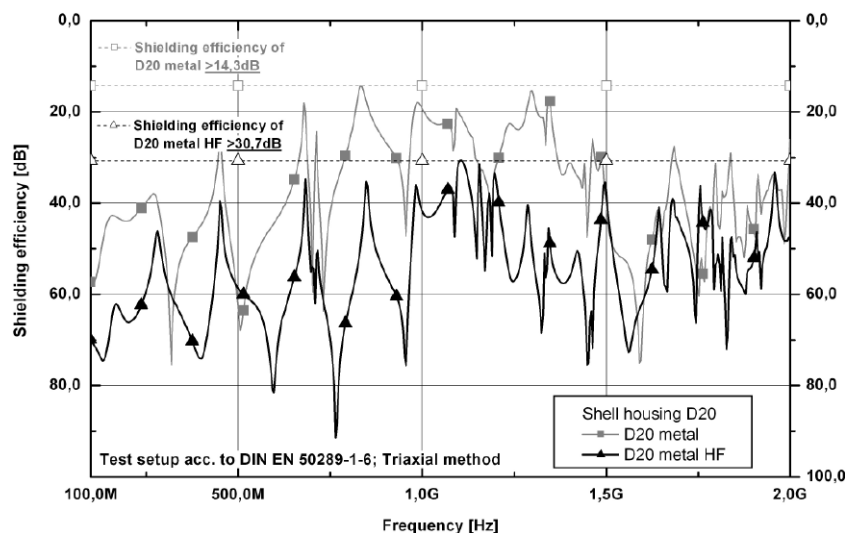
One advantage of metallised housings is their reduced weight (40 grams compared to 180 grams of a full metal housing). Therefore, minimal interference is applied to the pcb in applications where strong vibration is occurring. The HARTING housings are comparatively light through the use of metallised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

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

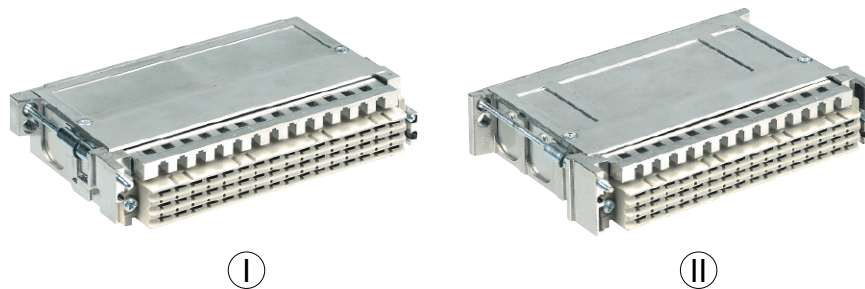
In general, one should keep in mind that an unshielded cable entry leads to loss of the shielding against electromagnetic interference.

“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).

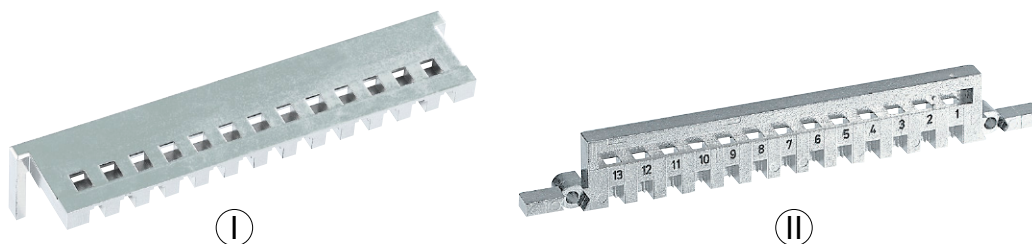


Shell housing D 20 metallised for types F, H and MH



Identification	Part number	Drawing	Dimensions in mm
<p>Shell housing D 20/2 metallised with two side cable entries</p> <p style="text-align: center;">I</p> <p>Supplied with: see page 20.20</p>	<p>20 mm 09 06 948 0521</p>	<p>Order inserts separately</p> <p>Blanking piece 2 x</p>	
<p>Shell housing D 20/4 metallised with four side cable entries</p> <p style="text-align: center;">II</p> <p>Supplied with: Shell 1x Cover 1x Locking screw 2x (09 06 000 9920) Locking washer 2.3 2x Screw BZ 2.2x7.5 12x Blinding piece 3x Cable clamp 2x</p>	<p>20 mm 09 06 948 0522</p>		
<p>Metallised insert e. g. for LED*</p> <p>for 55 mm height</p>	<p>09 06 900 9986</p>	<p>pcb</p>	
<p>for 60 mm height</p>	<p>09 06 900 9987</p>	<p>pcb</p>	
<p>Metallised round cable insert* 2 x \varnothing 11</p>	<p>09 06 900 9988</p>		

* Fits D 20/2 metallised
Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2



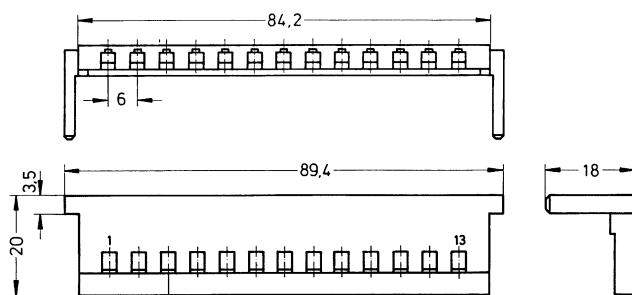
Coding

Identification Part number Drawing Dimensions in mm

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

I

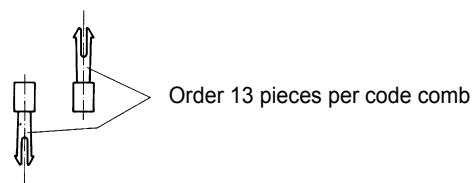
09 06 900 9984^{f)}



Code pin³⁾

09 06 001 9905¹⁾

¹⁾ Order 13 pieces per code comb



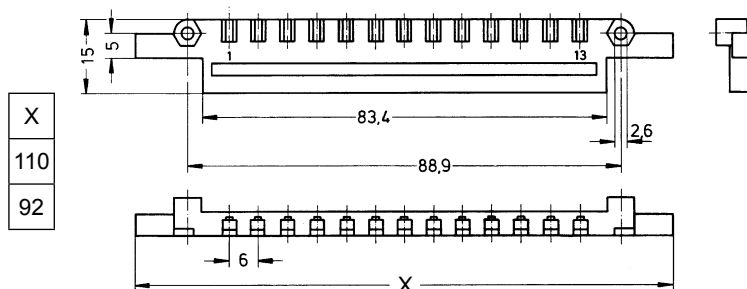
Metallised code comb for male connector³⁾

II

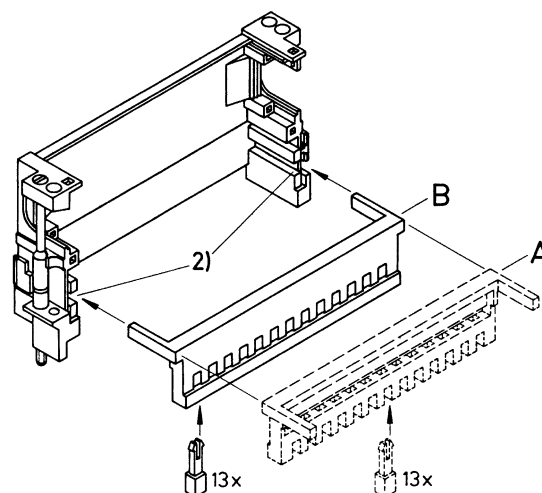
09 06 900 9985^{f)}

09 06 901 9985^{f)}

short version for a full metal locking lever



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 20.25

Mounting example **B** max. cable entry \varnothing 14 mm to the bottom, see page 20.25

³⁾ Fits D 20/2 and D 20/4 metallised

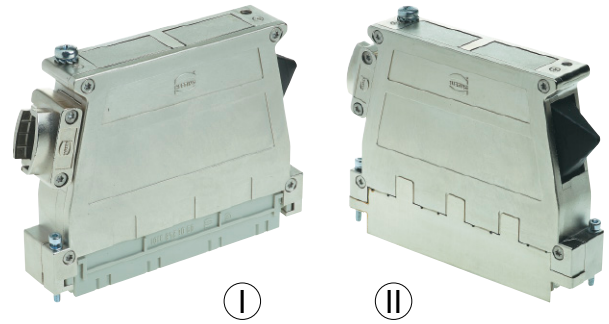
^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

Identification	Part number	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 60 297, part 3-101</p> <p>Single fixing* without nut</p> <p>with nut M 2.5 DIN EN ISO 4 036</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>M 2.5 DIN EN ISO 4 036</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>M 2.5 DIN 562</p> <p>2) supplied with fixing</p>	
<p>Protection and fixing* strip for 20 mm shell housing Single fixing fits female connectors and I element crimp</p>	<p>09 06 901 9909</p>		

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

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

Shell housing D 20 metal for types F, H and MH



Identification	Part number	Drawing	Dimensions in mm
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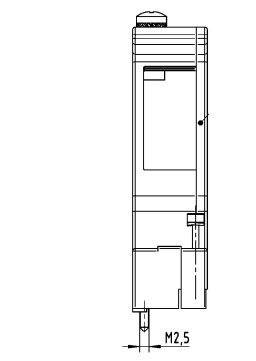
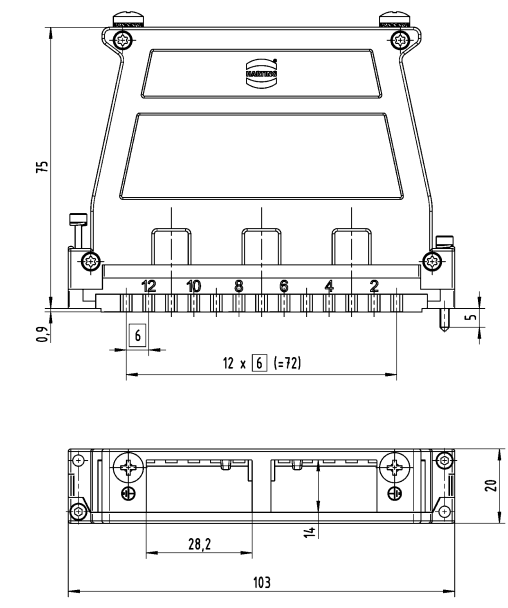
Shell housing D 20 metal

❶

Supplied with:

Shell with coding	1x
Cover	1x
Locking screw (hexagonal) M2.5 x 23 (09 06 800 9953)	2x
Screw (torx) M2.5 x 10 (09 06 800 9960)	4x
Earth screw M4 x 8 (09 06 800 9958)	2x

09 06 848 0550



Shell housings

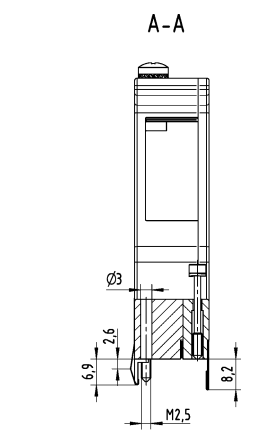
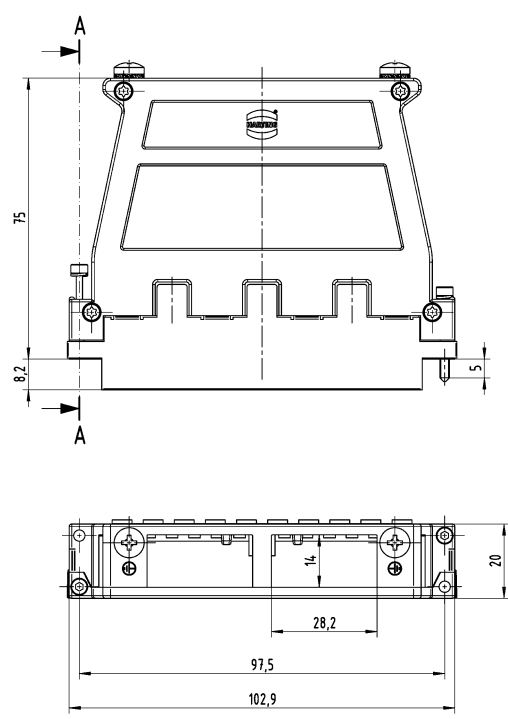
Shell housing D 20 metal HF with nickel-plated surface

❷

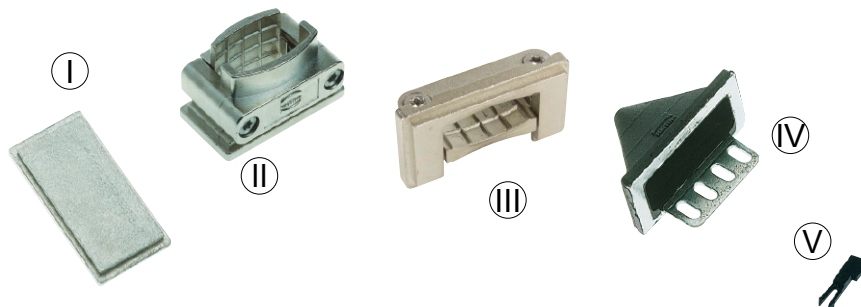
Supplied with:

Shell with coding and HF-sealing spring	1x
Cover with shielding plate	1x
Locking screw (hexagonal) M2.5 x 23 (09 06 800 9953)	2x
Screw (torx) M2.5 x 10 (09 06 800 9960)	4x
Earth screw M4 x 8 (09 06 800 9958)	2x

09 06 848 0551

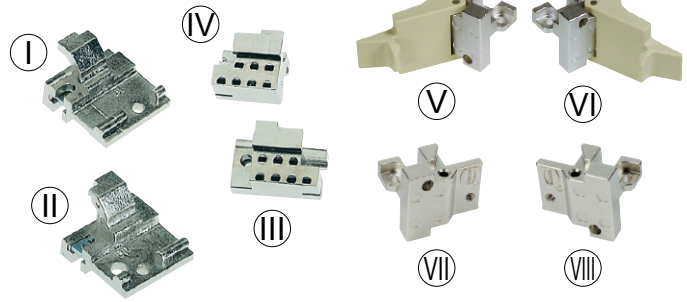


Shell housing D 20 metal for types F, H and MH



Identification	Part number	Drawing	Dimensions in mm
Blinding piece I	09 06 800 9951		
Cable clamp wide II	09 06 800 9955		
small III	09 06 800 9962		
Cable grommet with strain relief IV	09 06 800 9950		
Crimp flange insert	09 06 800 9952		
Cable clamp cable-Ø appr. 5- 7 mm	61 03 000 0141		
cable-Ø appr. 7-10 mm	61 03 000 0044		
cable-Ø appr. 10-12 mm	61 03 000 0143		
Blanking piece for hoods	61 03 000 0042		
Code pin V	09 06 001 9905	Order 13 pieces per code comb	
Hexagon ball-head screw driver	09 99 000 0003	Werkzeugsatz Set of tools 	

Shell housing D 20 metal HF for types F, H and MH



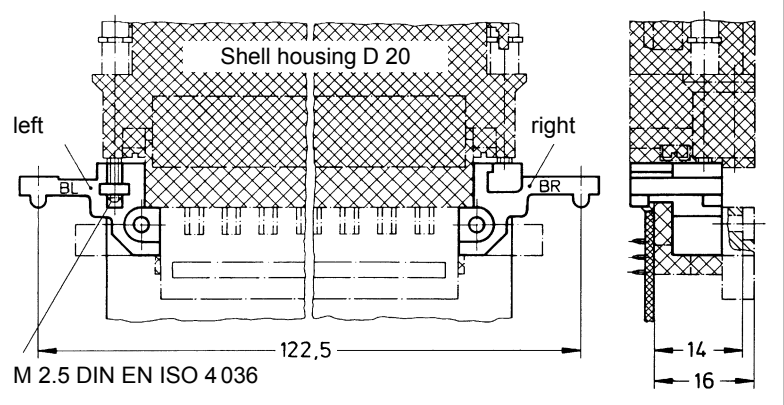
Identification Part number Drawing Dimensions in mm

Fixing brackets B metallised for male connectors
for 19" racks according to DIN EN 60 297, part 3-101

Single fixing (I)
with nut M 2.5 DIN EN ISO 4 036 (II)

left 20 mm 09 06 901 9924^{f)}

right 20 mm 09 06 901 9925^{f)}



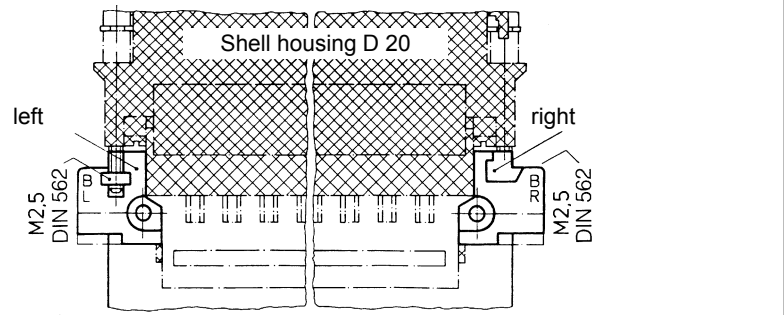
Multiple fixing

with coding at fixing bracket with nut M 2.5 DIN 562 (III)

(IV)

left 20 mm 09 06 900 9997^{f)}

right 15 mm 09 06 900 9996^{f)}



Shell housings

Fixing brackets B metal for male connectors
for 19" racks according to DIN EN 60 297, part 3-101

Single fixing

with ejector handle (V)

(VI)

without ejector handle (VII)

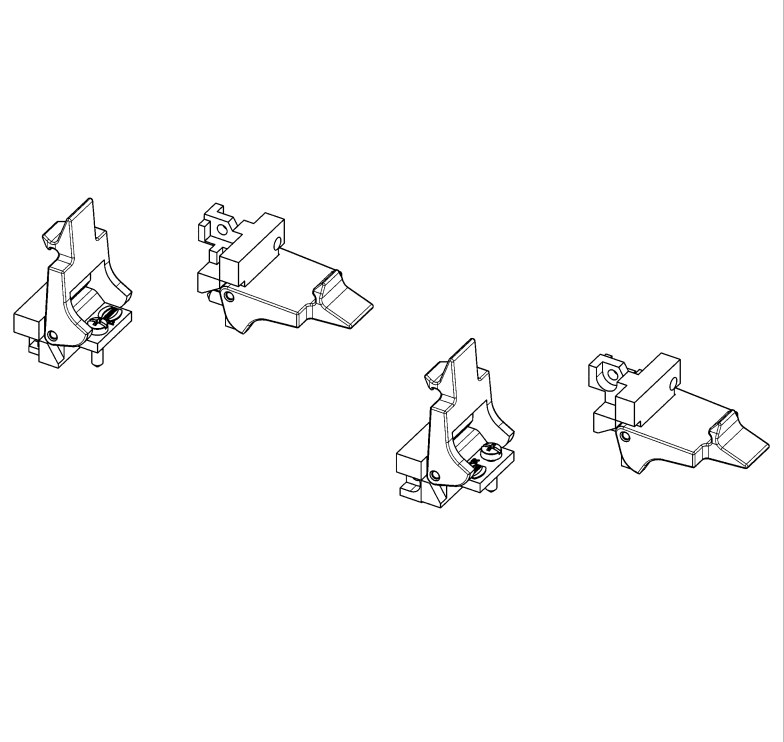
(VIII)

left 09 06 800 9946

right 09 06 800 9948

left 09 06 800 9966

right 09 06 800 9968



20
-
32

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

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 03
Male	2 x 48 way type F interface connectors I with crimp contact elements see chapter 03

Hoods and housings

see catalogue "Heavy Duty Han® Connectors"

chapter 30
size 24 B

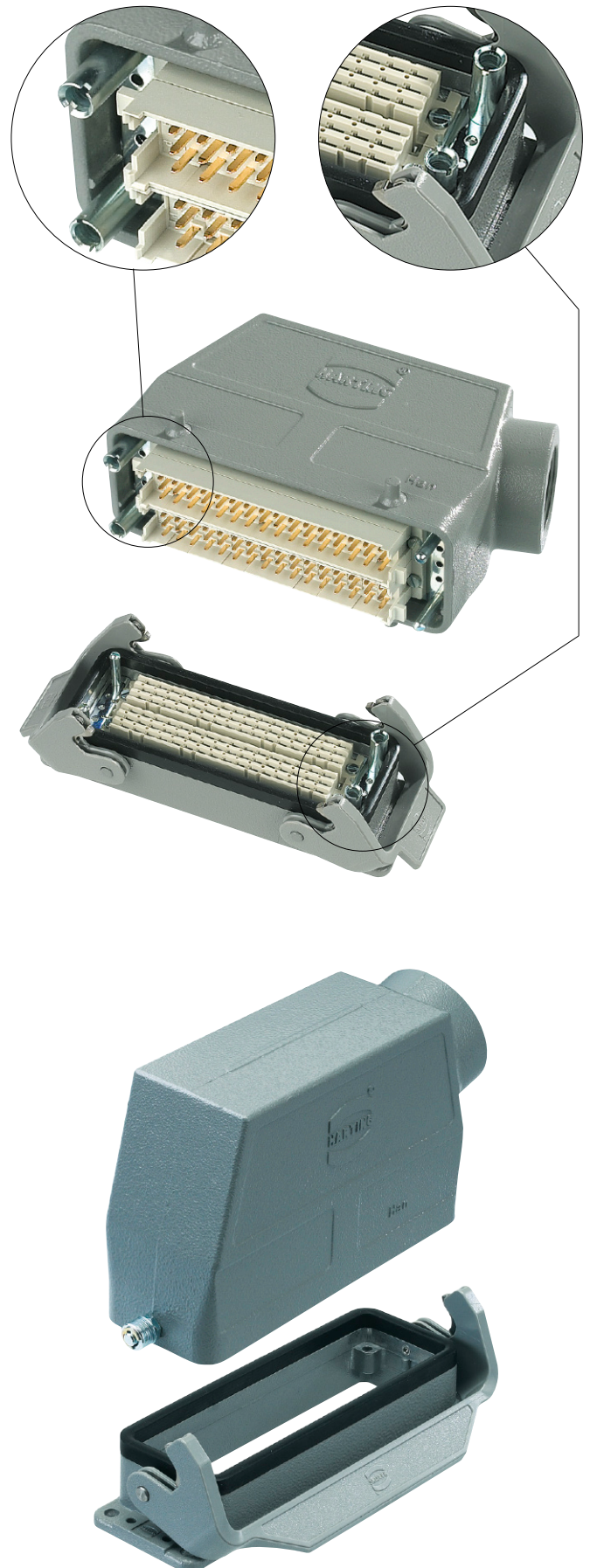
Degree of protection for hoods and housings: IP65

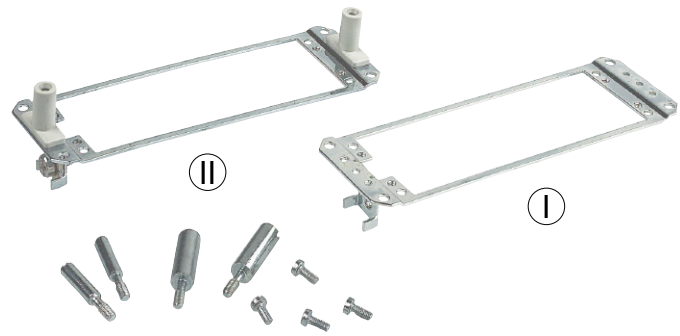
Retaining frames

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.

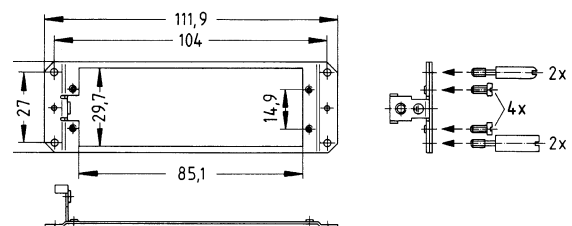




Identification Part number Drawing Dimensions in mm

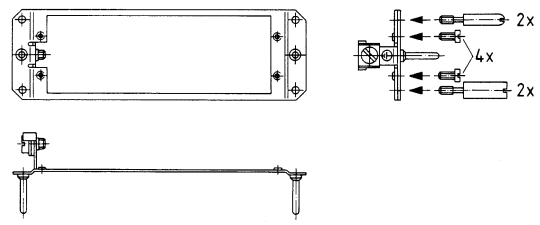
Retaining frame without contact elements
 I

09 06 001 9904



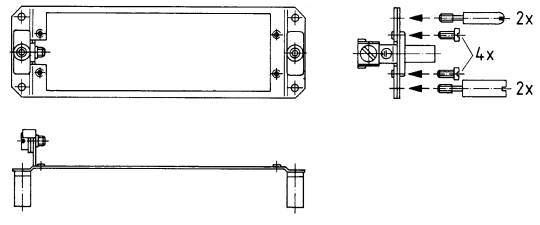
Retaining frame with 2 contact pins and ground termination

09 06 001 9902



Retaining frame with 2 contact sockets and ground termination

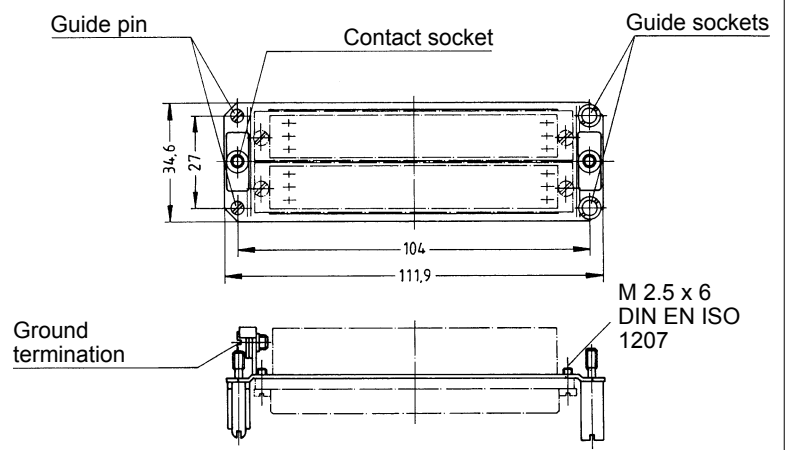
09 06 001 9903



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



Shell housings