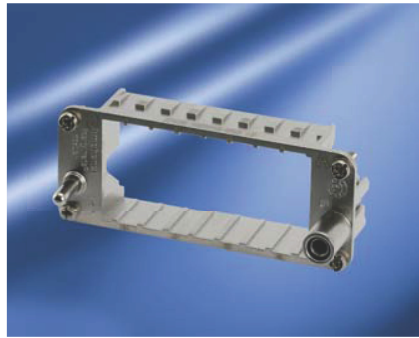
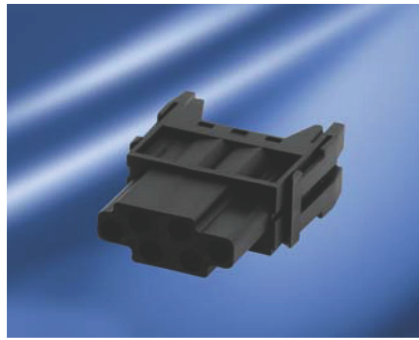





heavy | mate[®] F

- **Modular connector**
- **Compatible with market standard**
- **Rated voltage up to 1000 V**
- **Rated current up to 100 A**
- **Termination: crimp**
- **Numbers of contacts: 2 - 102**



Approvals, Testhouse	Characteristics	Approval-Number
UL 	in preparation	in preparation
CSA 	in preparation	in preparation

General information

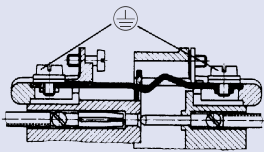
- Modules inserts without crimp contacts, crimping tools see separate catalogue “Tools”.
- Contacts must be ordered separately, processing instructions see catalogue “Tools”.
- Connectors series heavy|mate® F may be engaged or disengaged when live but without electrical load.
If these connectors are mated or unmated under load, the load shall be reduced to 10 % of rated current.
- We recommend using the high profile housings / hoods for the heavy|mate® F inserts.
- Empty modul spaces have to be filled with blind modules.
- Torque for PE connection 1.2 Nm



Advantages of the system

- No standard but interchangeable with competitive products.
- Housings are designed according to DIN EN 175 301 801
- Simply connecting of the modules and frames.

First-to-mate last-to-break protective ground contact



Range of housings

Size E6



Size E10



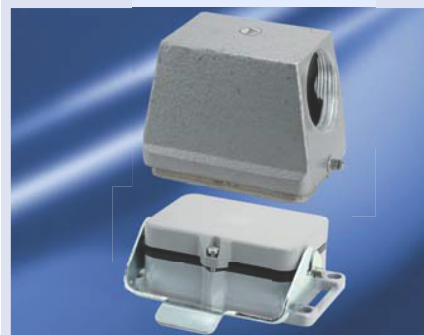
Size E16



Size E24



Size E48



Requirements

- 3 x 400V; 50A; 6mm² wire gauge
- 8 x 250V; 8A; 1.5mm² wire gauge
- 5 x 400V; 15A; 4mm² wire gauge

Solution

1. Check how 16 contacts can be realized; see modules overview on page 78

Possible selection:

- a) 1 x 17 contacts
- b) 2 x 12 contacts
- c) 1 x 6 contacts + 1 x 12 contacts
- d) 1 x 3 contacts + 1 x 6 contacts + 1 x 12 contacts

2. Check technical parameters / solution, see detail pages of the modules from page 84

Possible selection:

- a) not possible due to voltage
- b) not possible due to voltage
- c) not possible due to current
- d) POSSIBLE

3. Choose matching contact, see detail page of the modules on page 84

Possible selection:

- a) 3 contacts = C146 10A003 500 15 → contacts = VN01 040 0013 1C
- b) 6 contacts = C146 10A006 500 15 → contacts = VN01 025 0039 1C
- c) 12 contacts = C146 10A012 500 15 → contacts = VN01 016 0027 1C

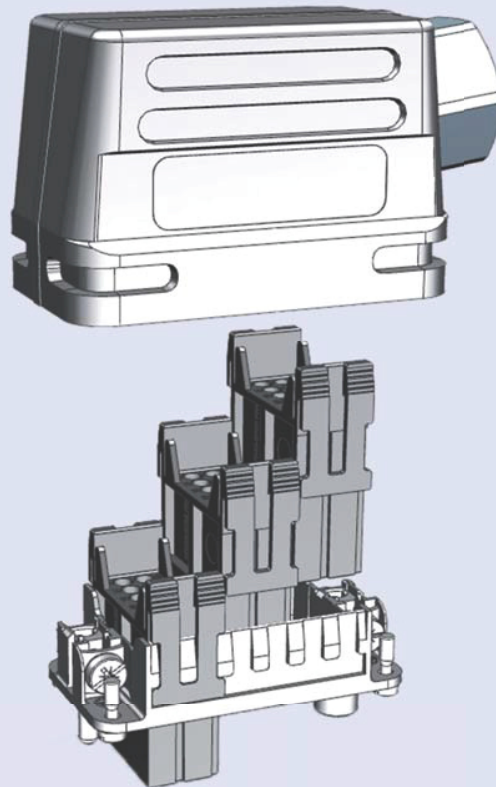
4. Choose matching frame, see frames on page 82

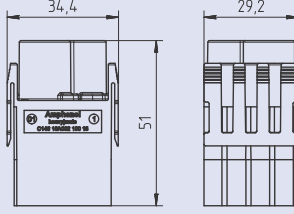
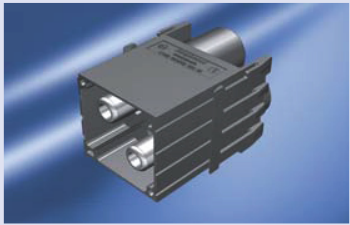
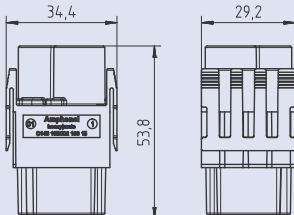
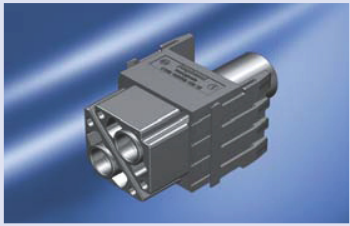
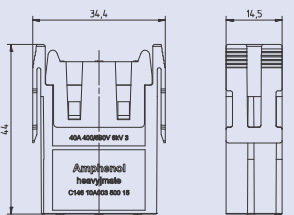

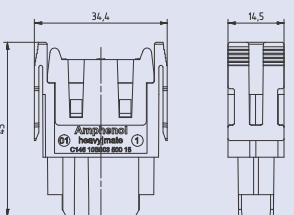

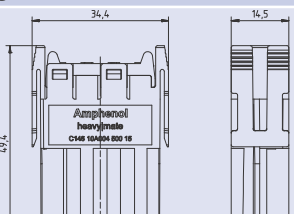

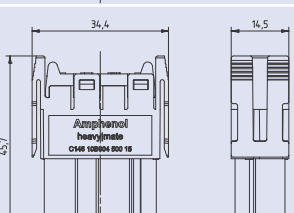

Solution: C146 10P10 000 15

5. Choose matching housing, see housings on page 184

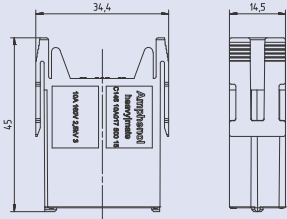

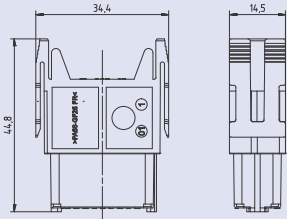

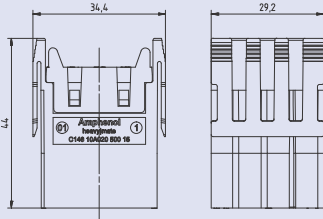

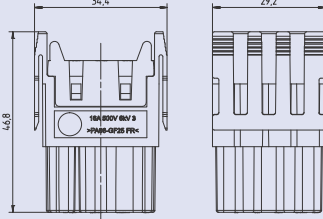

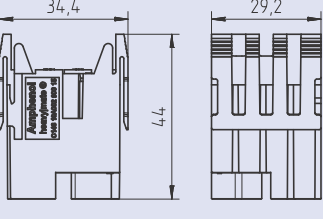

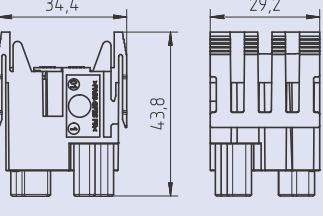

Solution: C146 21R010 600 8

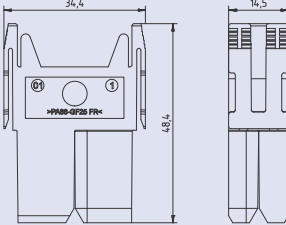

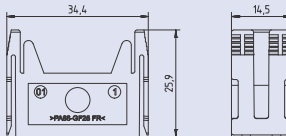

Schematic construction



Description	Part Number	Drawing	Figure
2 contacts module for turned contacts, 1000V, details see page 84			
Pin modules	C146 10A002 100 15		
Socket modules	C146 10B002 100 15		
3 contacts module for turned contacts, details see page 86			
Pin modules	C146 10A003 500 15		
Socket modules	C146 10B003 500 15		
4 contacts module for turned contacts, 830 V, details see page 88			
Pin modules	C146 10A004 500 15		
Socket modules	C146 10B004 500 15		

Description	Part Number	Drawing	Figure
6 contacts module for turned contacts, 500 V, details see page 90			
Pin modules	C146 10A006 500 15		
Socket modules	C146 10B006 500 15		
8 contacts module for turned contacts, 400 V, details see page 92			
Pin modules	C146 10A008 500 15		
Socket modules	C146 10B008 500 15		
12 contacts module for turned contacts, 250 V, details see page 94			
Pin modules	C146 10A012 500 15		
Socket modules	C146 10B012 500 15		

Description	Part Number	Drawing	Figure
17 contacts module for turned contacts, 160 V, details see page 96			
Pin modules	C146 10A017 500 15		
Socket modules	C146 10B017 500 15		
20 contacts module for turned contacts, 500 V, details see page 98			
Pin modules	C146 10A020 500 15		
Socket modules	C146 10B020 500 15		
Shielded module 2x4 contacts for bus signals,, 50 V, details see page 100			
Pin modules	C146 10A002 900 15 C146 10A004 901 15		
Socket modules	C146 10B002 900 15 C146 10B004 901 15		

Description	Part Number	Drawing	Figure
Blind module, details see page 102			
Blind module with centering function	C146 10H000 000 15		
Blind module standard	C146 10H000 001 15		

Description	Part Number	Drawing	Figure
Frame for 2 modules Size E6 Housings from page 196			
Frame for pin modules	C146 10P006 000 15		
Frame for socket modules	C146 10S006 000 15		
Frame for 3 modules Size E10 Housings from page 198			
Frame for pin modules	C146 10P010 000 15		
Frame for socket modules	C146 10S010 000 15		
Frame for 4 modules Size E16 Housings from page 205			
Frame for pin modules	C146 10P016 000 15		
Frame for socket modules	C146 10S016 000 15		

Description	Part Number	Drawing	Figure
Frame for 6 modules Size E24 Housings from page 211			
Frame for pin modules	C146 10P024 000 15		
Frame for socket modules	C146 10S024 000 15		

heavy|mate[®] F Characteristics 2 contacts high current module

General Characteristics	Standard	Value
Number of contacts		2
Termination technique		crimp
Wire Gauge		10 – 35 mm ² (AWG 8-2)
Flammability	UL94	V-0
Elektrische Kennwerte		
Rated voltage	IEC 60664-1	1000 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	8 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹² Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver)

Derating Curves

In preparation

heavy|mate® F 2 contacts high current module + crimp contacts

Description	Part Number	Drawing	Figure
2 contacts high current module (Please order contacts separately)			
Pin module	C146 10A002 100 15		
Socket module	C146 10B002 100 15		

Supplied as	for wire gauge	AWG	Part Number		Figure
			Male contact	Female contact	
Turned 8 mm crimp contacts single contact					
silver plating	10 mm ²	8	N01 080 0003 1	N02 080 0003 1	
	16 mm ²	6	N01 080 0004 1	N02 080 0004 1	
	25 mm ²	4	N01 080 0005 1	N02 080 0005 1	
	35 mm ²	2	N01 080 0006 1	N02 080 0006 1	

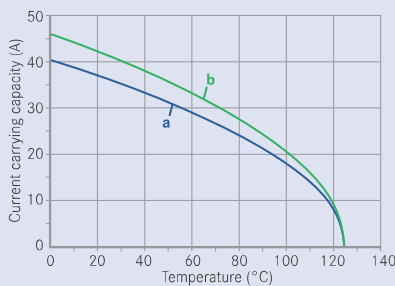
Tools					
Description	for wire gauge	Contact locator	Part Number		
			Crimping dies	Tool	
Crimping dies	25 mm ² 35 mm ²		TE 0600 042 TE 0600 022		

For use in pneumatic crimping tool EK12042 by Klauke or AHPW 400C by Neko .
Further tools see catalogue "Tools"

heavy|mate® F Characteristics 3 contacts module

General Characteristics	Standard	Value
Number of contacts		3
Termination technique		crimp
Wire Gauge		1.5 –6.0 mm ² (AWG 16-10)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	400 V (conductor – earth) 690 V (conductor – conductor)
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	6 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹⁰ Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver) / Au (gold)

Derating Curves



Curve	Wire gauge
a	4 mm ²
b	6 mm ²

heavy|mate® F 3 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
3 contacts module (Please order contacts separately)			
Pin module			
for wire gauge 1.5 - 6 mm ²	C146 10A003 500 15		
for wire gauge 10 mm ²	C146 10A003 501 15		
Socket module			
for wire gauge 1.5 - 6 mm ²	C146 10B003 500 15		
for wire gauge 10 mm ²	C146 10B003 501 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned 4 mm crimp contacts single contact						
silver plating	1.5 mm ²	16	100	VN01 040 0010 1C	VN02 040 0010 1C	
	2.5 mm ²	14	100	VN01 040 0011 1C	VN02 040 0011 1C	
	4 mm ²	12	100	VN01 040 0012 1C	VN02 040 0012 1C	
	6 mm ²	10	100	VN01 040 0013 1C	VN02 040 0013 1C	
	10 mm ²	8	100	VN01 040 0015 1C	VN02 040 0015 1C	

Tools for 4 mm² turned contacts

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Removal tool for contacts		TB 0000 146 0008	TP 0000 146 1400	FG 0300 146 5000
4-indent crimping tool ¹⁾				TB 0700 146
Further tools see catalogue "Tools"				

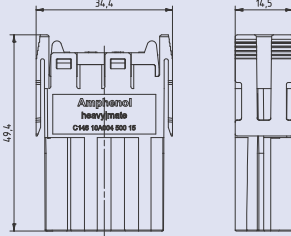

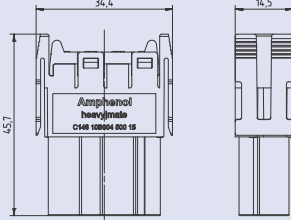

heavy|mate® F Characteristics 4 contacts module


General Characteristics	Standard	Value
Number of contacts		4
Termination technique		crimp
Wire Gauge		1.5 –6.0 mm ² (AWG 16-10)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	830 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	8 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹² Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
IP-degree of protection	IEC 60529	IP20
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver)

Derating Curves

In preparation

heavy|mate® F 4 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
4 contacts module (Please order contacts separately)			
Pin module	C146 10A004 500 15		
Socket module	C146 10B004 500 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned 4 mm crimp contacts single contact						
silver plating	1.5 mm ²	16	100	VN01 040 0010 1C	VN02 040 0010 1C	
	2.5 mm ²	14	100	VN01 040 0011 1C	VN02 040 0011 1C	
	4 mm ²	12	100	VN01 040 0012 1C	VN02 040 0012 1C	
	6 mm ²	10	100	VN01 040 0013 1C	VN02 040 0013 1C	

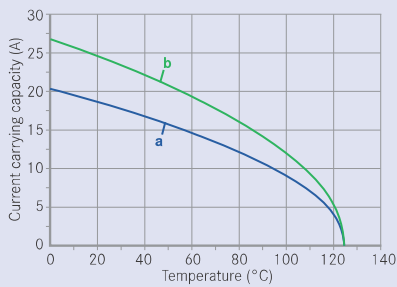
Tools for 4 mm² turned contacts

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Removal tool for contacts		TB 0000 146 0008	TP 0000 146 1400	FG 0300 146 5000
4-indent crimping tool ¹⁾				TB 0700 146
Further tools see catalogue "Tools"				

heavy|mate[®] F Characteristics 6 contacts module

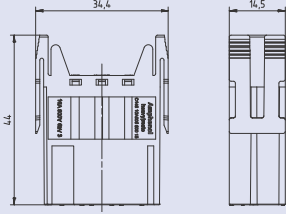

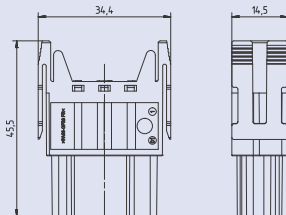

General Characteristics	Standard	Value
Number of contacts		6
Termination technique		crimp
Wire Gauge		0.5 – 4.0 mm ² (AWG 20-12)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	500 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	6 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹⁰ Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥ 500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver) / Au (gold)

Derating Curves



Curve	Wire gauge
a	1.5 mm ²
b	2.5 mm ²

heavy|mate® F 6 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
6 contacts module (Please order contacts separately)			
Pin module	C146 10A006 500 15		
Socket module	C146 10B006 500 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned 2.5 mm crimp contacts single contact						
silver plating	0.5 mm ²	20	100	VN01 025 0035 1C	VN02 025 0035 1C	
	0.75 - 1.0 mm ²	18	100	VN01 025 0036 1C	VN02 025 0036 1C	
	1.5 mm ²	16	100	VN01 025 0037 1C	VN02 025 0037 1C	
	2.5 mm ²	14	100	VN01 025 0038 1C	VN02 025 0038 1C	
	4.0 mm ²	12	100	VN01 025 0039 1C	VN02 025 0039 1C	
gold plating	0.5 mm ²	20	100	VN01 025 0035 2C	VN02 025 0035 2C	
	0.75 - 1.0 mm ²	18	100	VN01 025 0036 2C	VN02 025 0036 2C	
	1.5 mm ²	16	100	VN01 025 0037 2C	VN02 025 0037 2C	
	2.5 mm ²	14	100	VN01 025 0038 2C	VN02 025 0038 2C	
	4.0 mm ²	12	100	VN01 025 0039 2C	VN02 025 0039 2C	

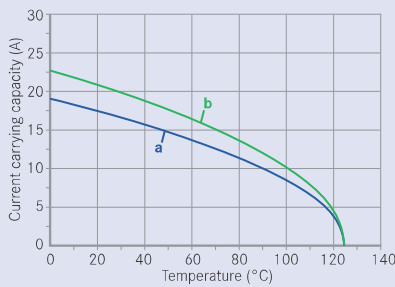
Tools for turned contacts

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Removal tool for contacts				FG 0300 146 7
Crimping tool for turned single contacts	0.5 - 2.5 mm ² 4 mm ²	TA 0010 146 000 6 TA 0010 146 000 7	TA 0000 144 TA 0000 124	TA 0000 TA 0500
4-indent crimping tool for turned contacts				TB 0600 146

Further tools see catalogue "Tools"

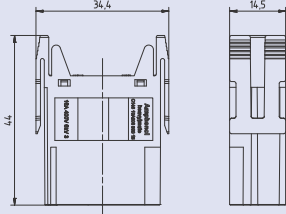

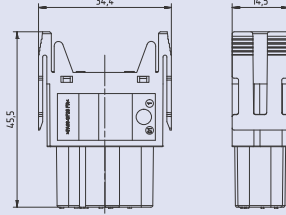

General Characteristics	Standard	Value
Number of contacts		8
Termination technique		crimp
Wire Gauge		0.5 – 4.0 mm ² (AWG 20-12)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	400 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	6 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹⁰ Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver) / Au (gold)

Derating Curves



Curve	Wire gauge
a	1.5 mm ²
b	2.5 mm ²

heavy|mate® F 8 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
8 contacts module (Please order contacts separately)			
Pin module	C146 10A008 500 15		
Socket module	C146 10B008 500 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned 2.5 mm crimp contacts single contact						
silver plating	0.5 mm ²	20	100	VN01 025 0035 1C	VN02 025 0035 1C	
	0.75 - 1.0 mm ²	18	100	VN01 025 0036 1C	VN02 025 0036 1C	
	1.5 mm ²	16	100	VN01 025 0037 1C	VN02 025 0037 1C	
	2.5 mm ²	14	100	VN01 025 0038 1C	VN02 025 0038 1C	
	4.0 mm ²	12	100	VN01 025 0039 1C	VN02 025 0039 1C	
gold plating	0.5 mm ²	20	100	VN01 025 0035 2C	VN02 025 0035 2C	
	0.75 - 1.0 mm ²	18	100	VN01 025 0036 2C	VN02 025 0036 2C	
	1.5 mm ²	16	100	VN01 025 0037 2C	VN02 025 0037 2C	
	2.5 mm ²	14	100	VN01 025 0038 2C	VN02 025 0038 2C	
	4.0 mm ²	12	100	VN01 025 0039 2C	VN02 025 0039 2C	

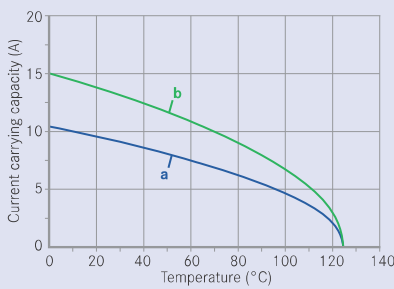
Tools for turned contacts

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Removal tool for contacts				FG 0300 146 7
Crimping tool for turned single contacts	0.5 - 2.5 mm ² 4 mm ²	TA 0010 146 000 6 TA 0010 146 000 7	TA 0000 144 TA 0000 124	TA 0000 TA 0500
4-indent crimping tool for turned contacts				TB 0600 146

Further tools see catalogue "Tools"

General Characteristics	Standard	Value
Number of contacts		12
Termination technique		crimp
Wire Gauge		0.14 – 2.5 mm ² (AWG 26–14)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	250 V (conductor – earth) 400 V (conductor – conductor)
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	4 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹⁰ Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/100/21
Upper temperature	IEC 60512-11-9	+100°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver) / Au (gold)

Derating Curves



Curve	Wire gauge
a	1.0 mm ²
b	1.5 mm ²

heavy|mate® F 12 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
12 contacts module (Please order contacts separately)			
Pin module	C146 10A012 500 15		
Socket module	C146 10B012 500 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned crimp contacts single contact						
silver plating	0.14 - 0.37 mm ²	26 - 22	100	VN01 016 0024 1C	VN02 016 0024 1C	
	0.5 mm ²	20	100	VN01 016 0025 1C	VN02 016 0025 1C	
	0.75 - 1.0 mm ²	20 - 16	100	VN01 016 0026 1C	VN02 016 0026 1C	
	1.5 mm ²	16 - 15	100	VN01 016 0027 1C	VN02 016 0027 1C	
	2.5 mm ²	14	100	VN01 016 0028 1C	VN02 016 0028 1C	
gold plating	0.14 - 0.37 mm ²	26 - 22	100	VN01 016 0024 2C	VN02 016 0024 2C	
	0.5 mm ²	20	100	VN01 016 0025 2C	VN02 016 0025 2C	
	0.75 - 1.0 mm ²	20 - 16	100	VN01 016 0026 2C	VN02 016 0026 2C	
	1.5 mm ²	16 - 15	100	VN01 016 0027 2C	VN02 016 0027 2C	
	2.5 mm ²	14	100	VN01 016 0028 2C	VN02 016 0028 2C	

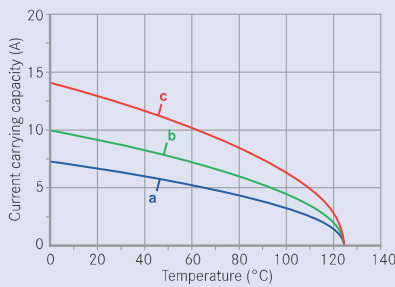
Tools for turned contacts

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Removal tool for contacts	-	-	-	FG 0300 146 1
Service crimping tool	0.14 - 0.5 mm ² 0.5 - 1.5 mm ²	-	-	TA 0100 146

Further tools see catalogue "Tools"

General Characteristics	Standard	Value
Number of contacts		17
Termination technique		crimp
Wire Gauge		0.14 –2.5mm ² (AWG 26-14)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	160 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	2.5 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹⁰ Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/100/21
Upper temperature	IEC 60512-11-9	+100°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver) / Au (gold)

Derating Curves



Curve	Wire gauge
a	0.5 mm ²
b	1.0 mm ²
c	1.5 mm ²

heavy|mate® F 17 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
17 contacts module (Please order contacts separately)			
Pin module	C146 10A017 500 15		
Socket module	C146 10B017 500 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned crimp contacts single contact						
silver plating	0.14 - 0.37 mm ²	26 - 22	100	VN01 016 0024 1C	VN02 016 0024 1C	
	0.5 mm ²	20	100	VN01 016 0025 1C	VN02 016 0025 1C	
	0.75 - 1.0 mm ²	20 - 16	100	VN01 016 0026 1C	VN02 016 0026 1C	
	1.5 mm ²	16 - 15	100	VN01 016 0027 1C	VN02 016 0027 1C	
	2.5 mm ²	14	100	VN01 016 0028 1C	VN02 016 0028 1C	
gold plating	0.14 - 0.37 mm ²	26 - 22	100	VN01 016 0024 2C	VN02 016 0024 2C	
	0.5 mm ²	20	100	VN01 016 0025 2C	VN02 016 0025 2C	
	0.75 - 1.0 mm ²	20 - 16	100	VN01 016 0026 2C	VN02 016 0026 2C	
	1.5 mm ²	16 - 15	100	VN01 016 0027 2C	VN02 016 0027 2C	
	2.5 mm ²	14	100	VN01 016 0028 2C	VN02 016 0028 2C	

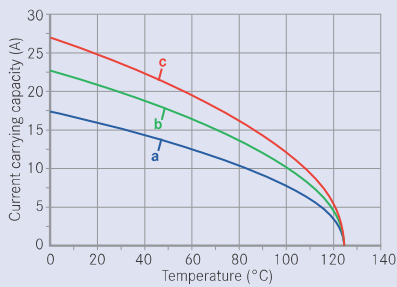
Tools for turned contacts					
Description	for wire gauge	Part Number			Tool
		Contact locator	Crimping dies		
Removal tool for contacts	-	-	-	-	FG 0300 146 1
Service crimping tool	0.14 - 0.5 mm ² 0.5 - 1.5 mm ²	-	-	-	TA 0100 146

Further tools see catalogue "Tools"

heavy|mate® F Characteristics 20 contacts module

General Characteristics	Standard	Value
Number of contacts		20
Termination technique		crimp
Wire Gauge		0.5 – 4.0 mm ² (AWG 20-12)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	500 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	6 kV
Current carrying capacity	IEC 60512-5-2	see derating curves
Contact resistance	IEC 60512-2-1	≤ 5 mΩ
Insulation resistance	IEC 60512-3-1	≥ 10 ¹⁰ Ω
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥ 500 mating cycles
IP-degree of protection	IEC 60529	IP00 (pin insert) / IP20 (socket insert)
Materials		
Module		PA6.6 GF
Colour module		black
Contact		CuZn (brass)
Contact plating		Ag (silver) / Au (gold)

Derating Curves



Curve	Wire gauge
a	1,5 mm ²
b	2,5 mm ²
c	4,0 mm ²

heavy|mate® F 20 contacts module + crimp contacts

Description	Part Number	Drawing	Figure
20 contacts module (Please order contacts separately)			
Pin module	C146 10A020 500 15		
Socket module	C146 10B020 500 15		

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	
Turned 2.5 mm crimp contacts single contact						
silver plating	0.5 mm ²	20	100	VN01 025 0035 1C	VN02 025 0035 1C	
	0.75 - 1.0 mm ²	18	100	VN01 025 0036 1C	VN02 025 0036 1C	
	1.5 mm ²	16	100	VN01 025 0037 1C	VN02 025 0037 1C	
	2.5 mm ²	14	100	VN01 025 0038 1C	VN02 025 0038 1C	
	4.0 mm ²	12	100	VN01 025 0039 1C	VN02 025 0039 1C	
gold plating	0.5 mm ²	20	100	VN01 025 0035 2C	VN02 025 0035 2C	
	0.75 - 1.0 mm ²	18	100	VN01 025 0036 2C	VN02 025 0036 2C	
	1.5 mm ²	16	100	VN01 025 0037 2C	VN02 025 0037 2C	
	2.5 mm ²	14	100	VN01 025 0038 2C	VN02 025 0038 2C	
	4.0 mm ²	12	100	VN01 025 0039 2C	VN02 025 0039 2C	

Tools for turned contacts

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Removal tool for contacts				FG 0300 146 7
Crimping tool for turned single contacts	0.5 - 2.5 mm ² 4 mm ²	TA 0010 146 000 6 TA 0010 146 000 7	TA 0000 144 TA 0000 124	TA 0000 TA 0500
4-indent crimping tool for turned contacts				TB 0600 146

Further tools see catalogue "Tools"

General Characteristics	Standard	Value
Number of contacts		2X4
Termination technique		crimp
Wire Gauge		0.14 – 2.5 mm ² (AWG 26-14)
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	50 V
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	3
Material group	IEC 60664-1	II (PA)
Rated impulse withstand voltage	IEC 60664-1	0,8 kV
Current carrying capacity at 40 ° C	IEC 60512-5-2	10A
Durchgangswiderstand	IEC 60512-2-1	≤ 5 mΩ
Climatical Characteristics		
Climatic category	IEC 60068-1	40/125/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
Materials		
Module		PA
Colour module		black
Contact		Cu-alloy
Contact plating		Ag (silver) / Au (gold)

Modules for shielding surrender independently of the housing.
For the transmission of bus signals.

Description	Part Number	Drawing	Figure
Contact insert 2x4 contacts (Please order contacts separately)			
Pin module	C146 10A002 900 15		
Male contact carriers 4 contacts	C146 10A004 901 15		
Socket module	C146 10B002 900 15		
Female contact carriers 4 contacts	C146 10B004 901 15		
Potential balance spring Pin/ Socket module	N18 146 000 7	 for male module for female module	

Supplied as	for wire gauge	AWG	Pieces	Part Number		Figure
				Male contact	Female contact	

Turned 1.5 mm crimp contacts

single contact	0.14 – 0.37 mm ²	26-22	100	VN01 016 0024 2C	VN02 016 0024 2C	
	0.5 mm ²	20	100	VN01 016 0025 2C	VN02 016 0025 2C	
	0.75 – 1.0 mm ²	20-16	100	VN01 016 0026 2C	VN02 016 0026 2C	
	1.5 mm ²	16-15	100	VN01 016 0027 2C	VN02 016 0027 2C	
	2.5 mm ²	14	100	VN01 016 0028 2C	VN02 016 0028 2C	

Tools

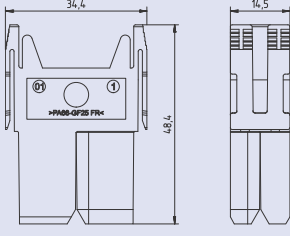

Description	for wire gauge	Part Number		
		Contact locator	Crimping dies	Tool
Crimping tool	-	-	-	TA 0000 oder TA 0500
Crimping dies	-	-	TA 0000 184	-
Contact locator	-	TA 0010 146 000 1	-	-
Removal tool for contacts	-	-	-	FG 0300 146 1

Further tools see catalogue "Tools"

heavy|mate® F Characteristics Blind module

General Characteristics	Standard	Value
Number of contacts		0
Flammability	UL94	V-0
Electrical Characteristics		
Rated voltage	IEC 60664-1	0
Pollution degree	IEC 60664-1	3
Installation (overvoltage) category	IEC 60664-1	III
Material group	IEC 60664-1	II (PA)
Climatical Characteristics		
Climatic category	IEC 60068-1	40/100/21
Upper temperature	IEC 60512-11-9	+125°C
Lower temperature	IEC 60512-11-10	-40°C
Mechanical Characteristics		
Mechanical operation	IEC 60512-9-1	≥500 mating cycles
Materials		
Module		PA6.6 GF

Modules with centering function allow the use of the modular system in rack and panel applications without housing. The modules align a floating frame so that modules can be plugged centred. For optimal function two modules must be used in the frame.

Description	Part Number	Drawing	Figure
Blind module			
Blind module with centering function	C146 10H000 000 15		
Blind module standard	C146 10H000 001 15	