



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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# heavy | mate<sup>®</sup>

## Heavy Duty Connectors



# Note from the CEO



## Ladies and Gentlemen,

For over 75 years Amphenol has enjoyed success as the interconnection technology provider of choice to industry-leading companies around the world. One of our key strategic areas of focus has been and is the Industrial market. Our organization works with leading manufacturers across a wide range of applications - including Energy Generation & Distribution, Transportation, Heavy Equipment, Factory Automation, Wireless Outdoor, ChipCard Readers - enabling smarter, faster and better technologies to connect products to customer solutions.

The Industrial market footprint of Amphenol covers over facilities in more than 12 different European countries and more than 30 countries worldwide. Our successful expansion into new regions as well as new industrial applications is a direct reflection of our agile, entrepreneurial management team and our unwavering commitment to execute Amphenol's strategies for the benefit of our customers, shareholders and employees.

Thank you for partnering with Amphenol. Our entire organization is at your service.

A handwritten signature in black ink, appearing to read 'R. Adam Norwitt'. The signature is fluid and stylized, with a long horizontal stroke at the end.

R. Adam Norwitt  
President and CEO, Amphenol Corporation

# Make use of the best

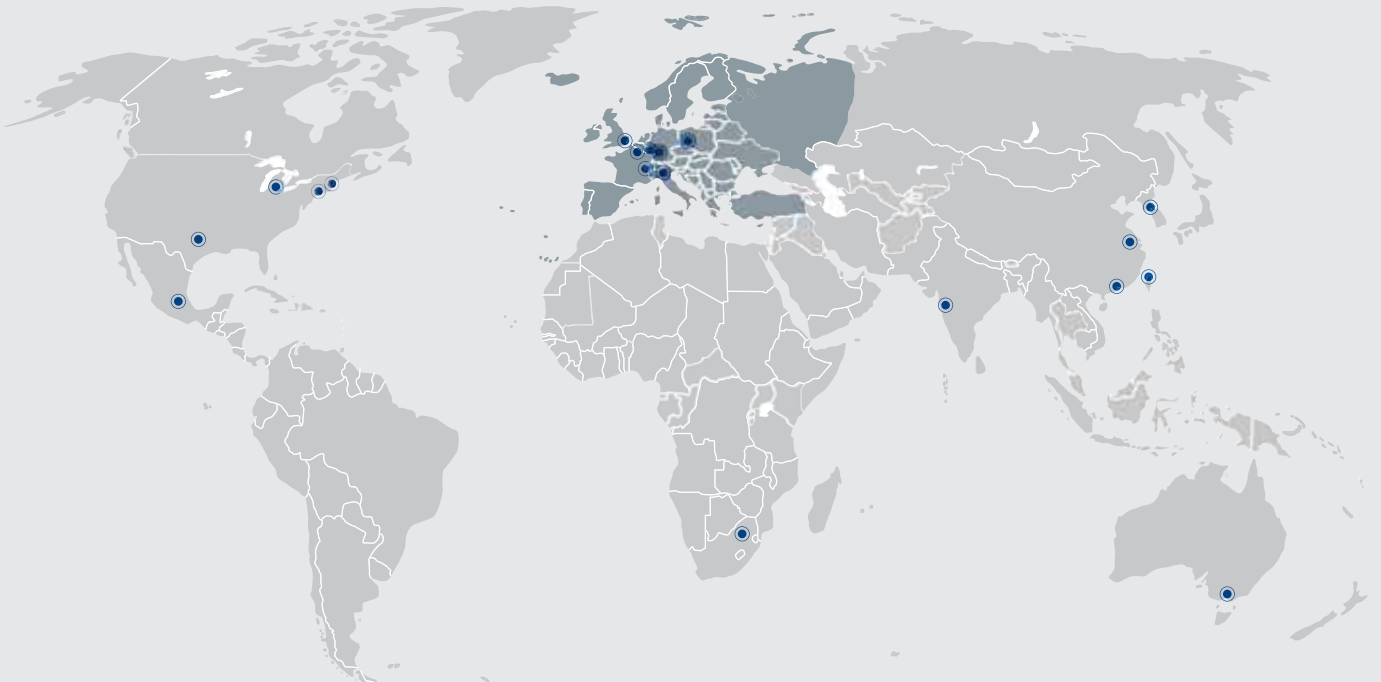
## Use our global resources

“Think global, act local!” Independently from where you are in Europe, we offer you our global expertise and great variety of products and technologies. And in comfort with your personal contact. Our numerous European offices are your access to our global resources.

### ● OUR OFFICES IN EUROPE AND WORLDWIDE

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FRANCE	CHINA	AUSTRALIA	SOUTH AFRICA
GERMANY	KOREA	MEXICO	INDIA
UNITED KINGDOM	TAIWAN	USA	ITALY





SECURITY, RELIABILITY AND COMFORTABLE SERVICE FROM ONE SOURCE.

# More time for important things: benefit from our service and diversity

Enjoy security, reliability and comfortable service from one source. INDUSTRIAL@AMPHENOL offers one of the most individual and most diversified service programmes in the market – exclusively for industrial customers. Access all possibilities of the Amphenol group through your personal expert adviser.



## WIDE PRODUCT RANGE

Take advantage of a choice of Amphenol products. Our broad product portfolio offers individual solutions from more than 85 member companies in the global Amphenol group.



## EXCLUSIVENESS AND FLEXIBILITY

One face to the customer: every inquiry is handled on an individual service level by your personal key account service partner. This ensures maximum transparency and best-in-class flexibility in the whole process.



## QUALITY

Interconnect systems need reliability, speed and flawless data transmission. We continuously test and guarantee the required standard in our products – and also in our personal services.



## INDIVIDUAL SOLUTIONS

Your project requires an individual solution that is not available off-the-shelf? As your think tank and discussion partner we provide engineering support and solution-oriented development for your tailor-made Amphenol product.



## SPEED AND AVAILABILITY

Smart and intelligent processes are the secret behind our service programme. Flexible planning and distribution, perfect logistics and highest availability are our key factors for best customer service.



## GLOBAL KEY ACCOUNT SERVICE

Our key account service is your individual entrance to global know-how, products and services. More than 85 Amphenol companies around the world offer an extensive range of technologies and products. We offer access to our worldwide resources through one individual contact person.

# heavy|mate<sup>®</sup> is a Modular Metal Connector Line

## What is heavy|mate<sup>®</sup> ?

heavy|mate<sup>®</sup> is a modular connector line, consisting of:

- Hoods & Housings
- Inserts
- Contacts

## Why heavy|mate<sup>®</sup> ?

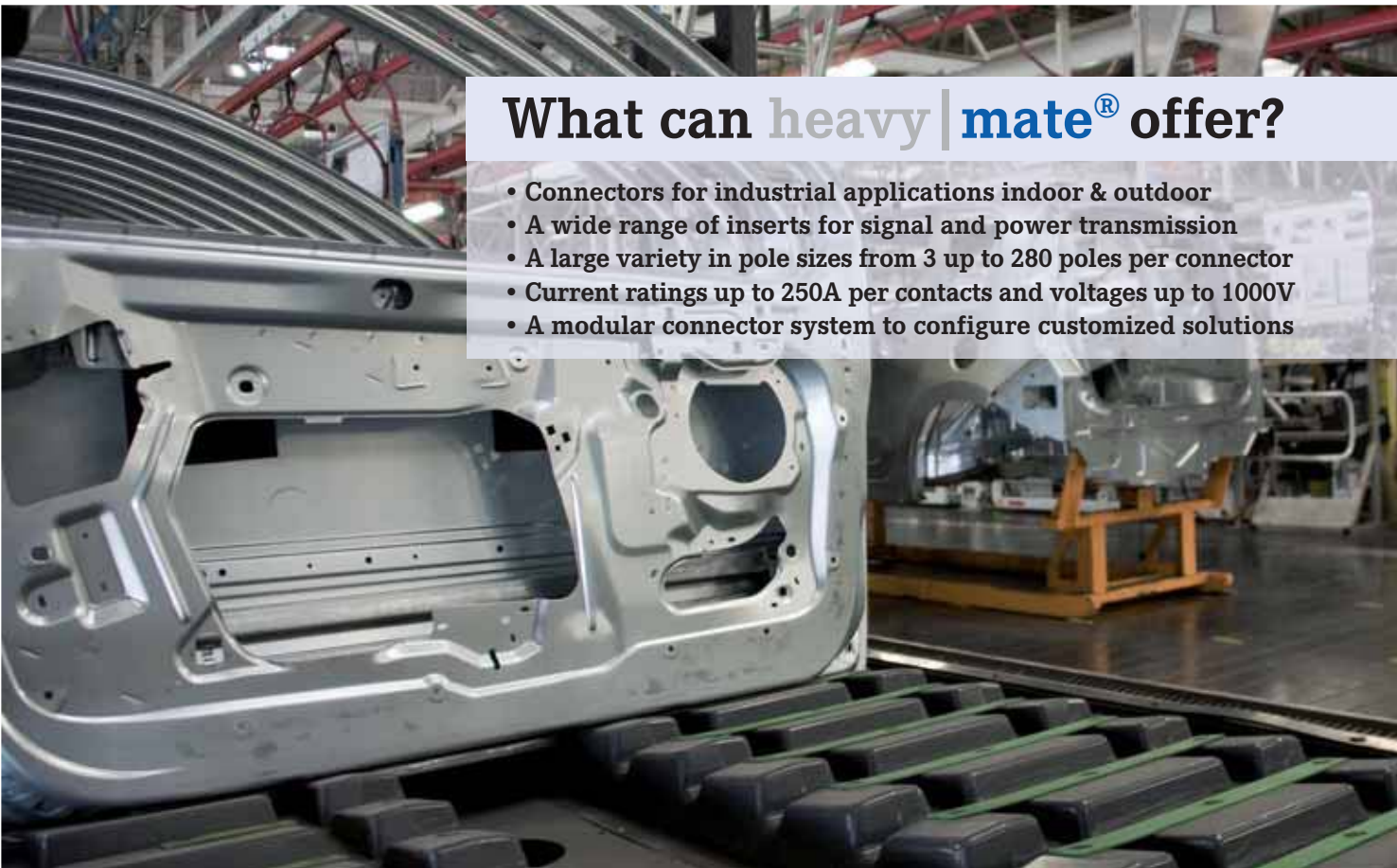
- Connections in harsh industrial environment
- Robust design necessary
- High number of poles or different kinds of signals transmitted
- Very good EMC protection required
- Power and signal transmission outdoor
- Very save locking system required

# for Applications in Industrial Environments.



## Major product features

- Hybrid interconnections
- Good costs
- Voltage up to 1000V
- VDE, UL, CSA approvals
- Vibration proof
- High current
- Signal transmission
- High pole sizes
- IP65 to IP68
- Corrosion resistance
- Robust



## What can heavy | **mate**<sup>®</sup> offer?

- Connectors for industrial applications indoor & outdoor
- A wide range of inserts for signal and power transmission
- A large variety in pole sizes from 3 up to 280 poles per connector
- Current ratings up to 250A per contacts and voltages up to 1000V
- A modular connector system to configure customized solutions



# How to select a solution with series heavy | mate®.

## Theory

- Select an insert that meets your requirements.
- Choose the related contacts if not included in inserts.
- Choose related housings.
- Choose related cable gland.
- If you are interested in a cable assembly, please ask us.

## Practice 1

### Requirements

- 250V
- 5A
- 60 contacts
- Termination: crimp

### Solution

- Check: Make a pre-selection on the overview page of the series, s. p. 10/11  
Possible series: heavy | mate® D, DD and M
- Check: Details on the overview pages of the sub-series, see pages 22, 38, 114  
All 3 variants are possible; Selection heavy | mate® D
- Check: Contact inserts on the detail page of the sub-series  
Selection: C146 10A064 000 2
- Check: Contacts on the same double page  
Selection: VN01 016 0002 1
- Check: Housings via crosslink at contact inserts  
Selection: C146 21R024 600 8
- Check: Gland bushing via crosslink at housings  
Selection: VN16 320 0126X



## Practice 2

### Requirements

- 3 x 400V; 50A; 6mm<sup>2</sup> wire gauge
- 8 x 250V; 8A; 1.5mm<sup>2</sup> wire gauge
- 5 x 400V; 15A; 4mm<sup>2</sup> wire gauge

### Solution

- **Check:** Make a pre-selection on the overview page of the series, see pages 10/11  
Possible series: heavy | **mate**<sup>®</sup> M
- **Check:** How 16 contacts can be realized, see modules overview on page 118  
Possible selection: a) 1 x 20 contacts  
b) 2 x 10 contacts  
c) 1 x 10 contacts + 1 x 5 contacts  
d) 1 x 3 contacts + 1 x 5 contacts + 1 x 10 contacts
- **Check:** Technical parameters / solution, see detail pages of the modules on page 126  
Possible selection: a) not possible due to voltage  
b) not possible due to voltage  
c) not possible due to current  
d) POSSIBLE
- **Check:** Choose matching contact, see detail page of the modules on page 126  
Possible selection: a) C146 A03 001 E8 - VN01 036 0002 1C  
b) C146 A0 001 E8 - VN01 025 0033 1C  
c) C146 A10 001 E8 - VN01 016 0027 1XC
- **Check:** Choose matching frame, see frames on page 124  
Solution: C146 P10 001 G8
- **Check:** Choose matching housing, see housings on page 162  
Solution: C146 21R010 600 8

# Make your selection out of the heavy | mate® series!

Series Characteristic	A page 14	D page 22	DD page 38	E page 44	EE page 62	E / FE / KO page 68	F page 74
<b>Voltage</b>							
250V	●	●	●	●	●	●	●
400V	●			●	●	●	●
500V				●	●		●
690V							●
830V							●
1000V							
<b>Current</b>							
10A	●	●	●	●	●	●	●
16A	●			●	●		●
35A							●
80A							●
100A							
200A							
<b>Numbers of contacts</b>				<b>Modules for</b>			
	3	7	24	6	10	6	3
	4	8	42	10	18	10	6
	10	15	72	16	32	16	8
	16	25	108	24	46	24	12
		40					17
		64					20
<b>Termination</b>							
Crimp		●	●	●	●		●
Screw	●			●		●	
Tension spring				●			

Cross reference list see [www.amphenol.de/xref/](http://www.amphenol.de/xref/)

HSE page 94	HvE page 98	K page 108	M page 114	Q page 156	Housings page 162	Accessories page 223	Series Characteristic
<b>Voltage</b>							
●	●	●	●	●			250V
●	●	●	●	●			400V
	●	●	●	●			500V
	●	●	●				690V
		●	●				830V
			●				1000V
<b>Current</b>							
●	●	●	●	●			10A
●	●	●	●	●			16A
●		●	●				35A
		●	●				80A
			●				100A
			●				200A
<b>Modules for</b>				<b>Numbers of contacts</b>			
6	3+2 6+2 10+2 16+2	4 / 0 4 / 2 6 / 36	1 2 3 4 5 10 20	5 7			
<b>Termination</b>							
		●	●	●			Crimp
●	●	●					Screw
							Tension spring

# The highlights of the series heavy|mate®.

## Contact technology

- Turned contacts, which correspond to the market standard.
- Turned female contacts of copper for higher current-carrying capacity – specifically for the modular system heavy|mate® M.
- Radsok contact technology: These are laminated contacts with very low transition resistance, suitable for high current applications.
- Stamped contacts with high performance for semi-automatic processing at great cost savings.
- Selectively coated gold plating stamped contacts offer great savings.



## Housings

Surface coatings available in two versions: Standard or High-End with a salt mist resistance up to 500 hours.

Flexible cable entry in different positions – possible on request.

Robust metal levers in 1 and 2 locking-lever-system.

Quality EMC solutions.

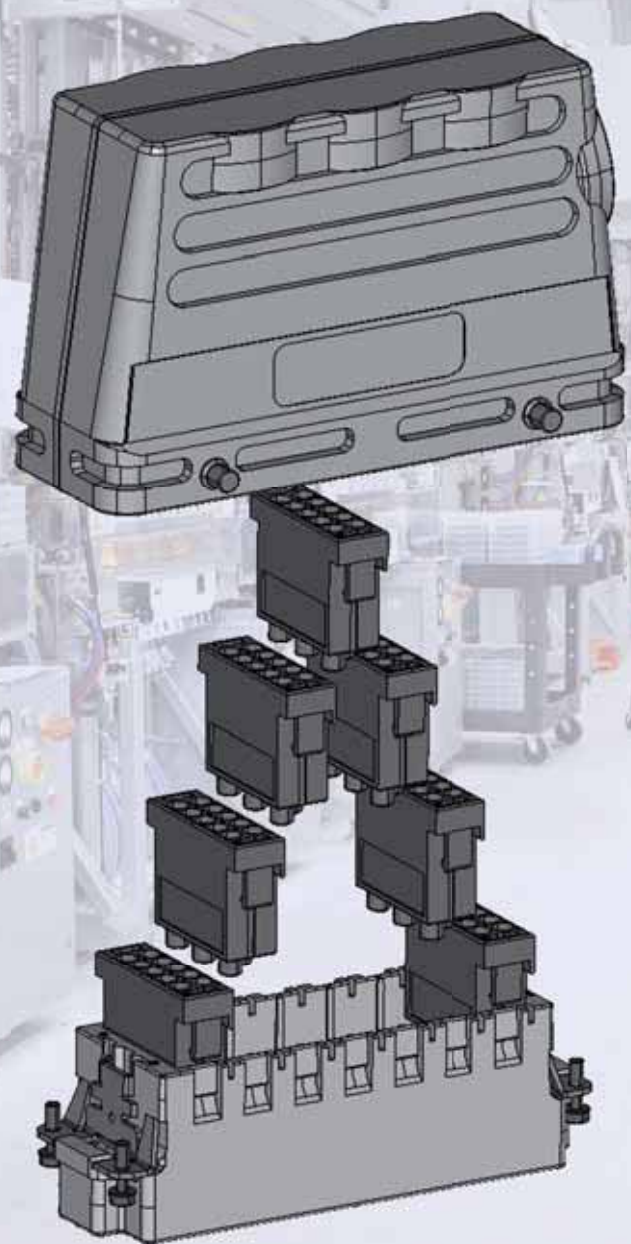
Tightness classes in IP65, IP67 or IP68!



# Modular system

With the new series heavy|mate® F Amphenol offers a new modular system that is compatible with the market leader. With the series heavy|mate® M Amphenol offers a system with many benefits:

- More module slots in the connector.
- Large selection of contact-safe male contacts
- Stamped contacts and the Radsok contact technology
- Great cost savings potential






The background of the entire page is a dynamic industrial scene. In the upper portion, there's a close-up of a mechanical assembly with two circular gauges and various bolts. Below this, a large volume of bright orange and yellow sparks is being ejected from a dark, metallic surface, likely a grinding or cutting process. The overall lighting is a mix of cool blues and warm oranges, creating a sense of intense industrial activity.

# heavy | mate<sup>®</sup> A

- Rated voltage 250 / 400 V
- Rated current 14 A ... 18 A
- Termination: screw
- Number of contacts: 3, 4, 10, 16, 32



Approvals, Testhouse	Characteristics	Approval-Number
SEV 	250 V, 10 A	
UL 	600 V, 14 A	E 63093
CSA 	600 V, 10 A; 16 A; 20 A	LR 700721

In general approvals refer to representative versions of the connector series. Extent and specification of tests upon request.



## General information

- For series heavy|mate® A connectors may be engaged or disengaged when live but without electrical load. If these connectors are used as plug and socket device, the load shall be reduced to 10 % of the rated current.

- Low and high profile housing for heavy|mate® A series inserts for 10 and 16 contacts.

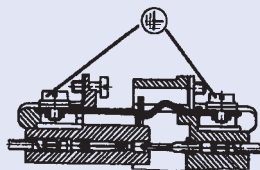


## No standard for this series, but:

- Interchangeable with other makes
  - a) contact insert to contact insert
  - b) contact insert to housing 10, 16 contacts

Housings are designed according to DIN EN 175 301 - 801

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



## Range of housings

Size A3/4



Size A10

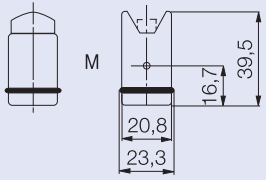

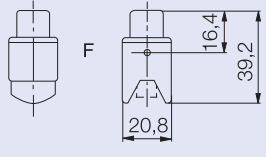



Size A16

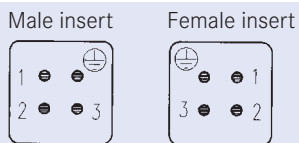


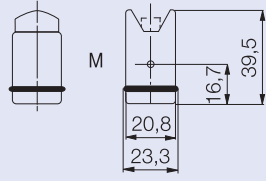

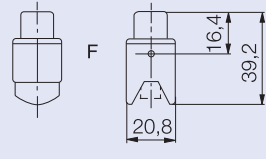

## heavy|mate® A Characteristics contact inserts

General Characteristics	Standard	Value			
Number of contacts		3/4 + ⊕	10 + ⊕	16 + ⊕	32 + ⊕
Termination technique		screw			
Wire gauge		0.25 - 2.5 mm <sup>2</sup>			
Flammability	UL 94	V-0			
Electrical Characteristics					
Rated voltage	IEC 60664-1	400 V	250 V		
Pollution degree	IEC 60664-1	3			
Installation (overvoltage) category	IEC 60664-1	III			
Material group	IEC 60664-1	III b			
Rated impulse withstand voltage	IEC 60664-1	4 KV			
Current carrying capacity	IEC 60512-5-2	see derating curves			
Rated current T <sub>amp</sub> = 40 °C		18 A	16 A	14 A	14 A
Contact resistance	IEC 60512-2-1	≤ 5 m Ω			
Insulation resistance	IEC 60512-3-1	≥ 10 <sup>10</sup> 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					
IP-degree of protection pin insert <sup>1)</sup>	IEC 60529	unmated IP00		mated IP20	
IP-degree of protection socket insert <sup>1)</sup>	IEC 60529	unmated IP20		mated IP20	
Weight pin insert		13 g	48 g	68 g	136 g
Weight socket insert		13 g	52 g	73 g	146 g
Mechanical operation	IEC 60512-9-1	≥ 500 mating cycles			
Materials					
Insert		PA	PBT	PBT	PBT
Contacts		Cu Zn (brass)			
Contact plating		Ag (silver)			

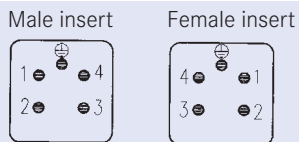
Description	Part Number	Drawing	Figure
<b>Contact insert 3 + ⊕</b>			
Male insert for screw termination	C146 10A003 002 4		
Female insert for screw termination	C146 10B003 002 4		

**Pin layout**

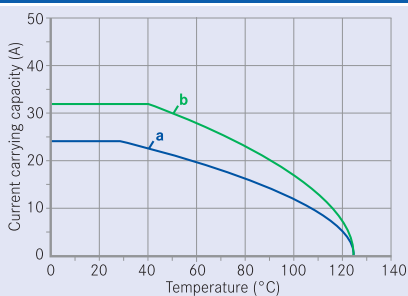


Description	Part Number	Drawing	Figure
<b>Contact insert 4 + ⊕</b>			
Male insert for screw termination	C146 10A004 002 4		
Female insert for screw termination	C146 10B004 002 4		

**Pin layout**

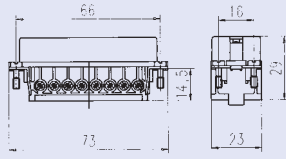

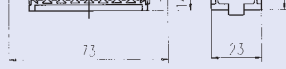
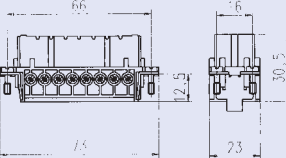




**Derating curves**



Curve	Wire gauge
a	1.5 mm <sup>2</sup>
b	2.5 mm <sup>2</sup>



Description	Part Number	Drawing	Figure
<b>Contact insert 16 + ⊕</b>			
Male insert for screw termination	C146 10A016 002 4		
Male insert with wire protection for screw termination	C146 10A016 102 4		
Female insert for screw termination	C146 10B016 002 4		
Female insert with wire protection for screw termination	C146 10B016 102 4		

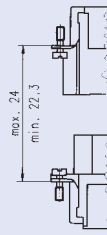
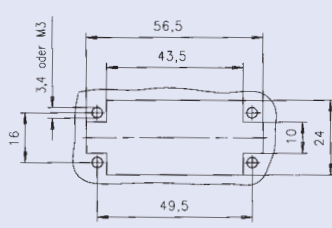
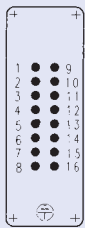
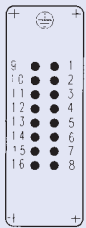
**Pin layout**

**Assembly instruction**

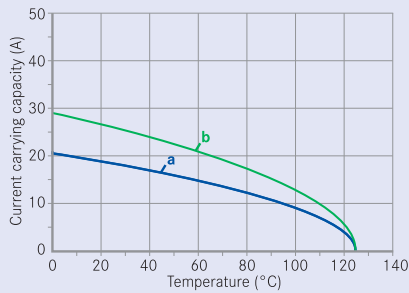
Male insert

Female insert

Panel cut out (insert)



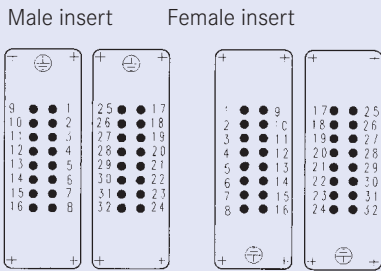
**Derating curves**



Curve	Wire gauge
a	1.5 mm <sup>2</sup>
b	2.5 mm <sup>2</sup>

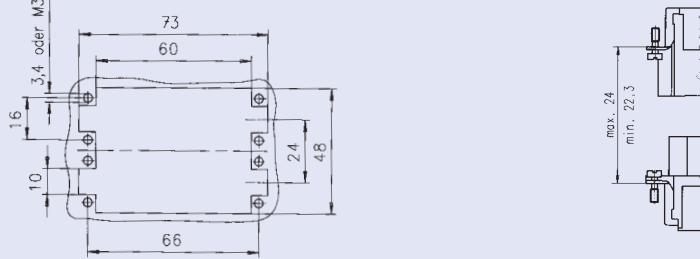
Description	Part Number	Drawing	Figure
<b>Contact insert 32 + ⊕</b>			
Male insert for screw termination	C146 10A016 002 4 (1 - 16) + C146 10A016 004 4 (17 - 32)		
Male insert with wire protection for screw termination	C146 10A016 102 4 (1 - 16) + C146 10A016 104 4 (17 - 32)		
Female insert for screw termination	C146 10B016 002 4 (1 - 16) + C146 10B016 004 4 (17 - 32)		
Female insert with wire protection for screw termination	C146 10B016 102 4 (1 - 16) + C146 10B016 104 4 (17 - 32)		

**Pin layout**

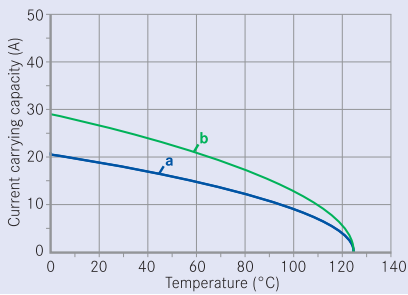


**Assembly instruction**

Panel cut out (insert)



**Derating curves**






Curve	Wire gauge
a	1.5 mm <sup>2</sup>
b	2.5 mm <sup>2</sup>



# heavy | mate<sup>®</sup> D

- Rated voltage 250 V
- Rated current 10 A ... 16 A
- Termination: crimp
- Number of contacts: 7, 15, 25, 40, 50, 64, 128



Approvals, Testhouse	Characteristics	Approval-Number
SEV 	250 V, 10 A	
UL 	600 V, 14 A 600 V, 15 A (high current)	E 63093
CSA 	600 V, 10 A	48932

In general approvals refer to representative versions of the connector series. Extent and specification of tests upon request.



**General information**

- Contact inserts without crimp contacts, crimping tools see separate catalogue „Tools“.
- Contacts must be ordered separately, processing instructions see catalogue „Tools“.
- We recommend using the high profile housings / hoods for the heavy|mate® D inserts.
- Connectors series heavy|mate® D 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 the rated current.
- For contact inserts for turned contacts, guide pins and guide socket are recommended (see page 226).
- By using contact inserts with two PE-connections without hoods, it is necessary to connect the facing of each PE-connection.
- If connectors are mounted in non conductive housings both protective earthing terminals shall be mounted.



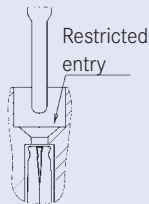
**Standardised connectors according to DIN EN 175 301 - 801 (DIN 43652)**

Interchangeable with all other products which are according to the standard.

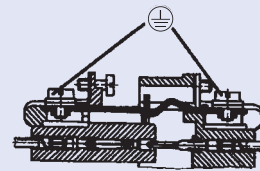
- a) Contact insert to contact insert 15, 25, 40, 64 way.
- b) Contact insert to housing 15, 25, 40, 64 way.

**High protection against mismatching**

- Female inserts with funnel shaped contact entry avoids mismatching with stamped contacts.



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



**Contact inserts for stamped contacts and for turned contacts**

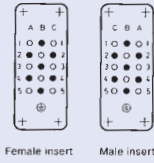


**Range of housings**

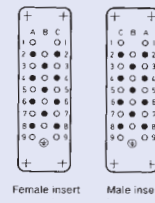
Size A3/4	Size A10	Size A16
Size E16	Size E24	Size E48

Modified contact arrangement for rated voltages of 400 V

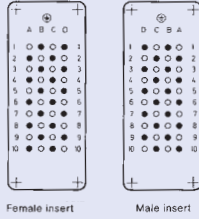
(15) → 7 + ⊕



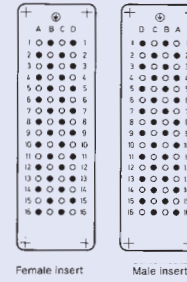
(25) → 11 + ⊕



(40) → 20 + ⊕



(64) → 32 + ⊕



- full load contact
- unoccupied

Removal of contacts, front releas

stamped male contacts  
all turned contacts



stamped female contacts

