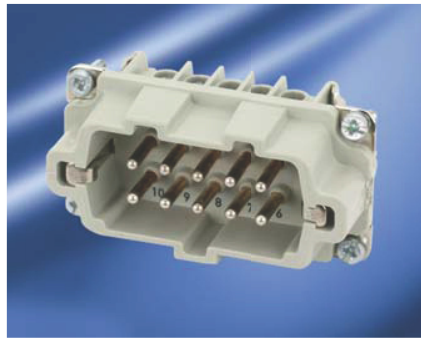


The background image shows a large industrial facility with a high ceiling, steel beams, and several large green and yellow machines. In the foreground, a white control cabinet is visible with various electrical components and hoses. The lighting is bright, coming from overhead industrial lamps.

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- Rated voltage 400 V
- Material contacts: iron-constantan
- Rated current 10 A
- Number of contacts: 6, 10, 16, 24



Connectors with iron (FE) and constantan (CO) contacts

are basically used in measuring and control circuits to serve as interface between FE/CO thermocouples and control unit, i. e. temperature control of moulds in injection moulding machines. Through the use of FE/CO connectors in the thermocouple circuit the measuring results are more accurate, thus the tolerance of the temperature control is much narrower.

Amphenol's Industrial Connectors with iron (FE) and Constantan (CO) contacts are used to connect FE/CO thermocouples with electronic signal amplifiers in measuring and control circuits, i. e. for temperature control of moulding machines.

Errors with various combinations

The connection of unlike metals (FE/Brass and CO/Brass) generate thermoelectric voltage errors in the measuring circuit caused by the flow from iron wire to the brass contact or by temperature changes at the contact elements.

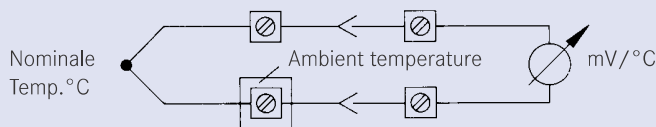
Nominal Temp.	Contact Material	without Thermo Contacts		with Thermo Contacts	
		MS/FE	MS/KO	FE/FE	KO/KO
100 °C		+ 4 %	- 16 %	- 4 %	- 2 %
200 °C		+ 2.5 %	- 8 %	- 3 %	- 1.5 %
300 °C		+ 1.3 %	- 12.7 %	- 1.3 %	0 %
400 °C		+ 1.5 %	- 4.5 %	- 1.0 %	0 %

By using FE/CO contacts respectively these deviations will be minimized.

Material / Temperature Range

Temperatur range	Material/measurement procedure
< 150 °C	any/Resistance measurement
150 °C - 450 °C	FE-CO (iron/Constantan)
450 °C - approx. 1000 °C	Ni/Cr-Ni (Nickel/Chrome/Nickel)

Temperature changes cause errors



heavy|mate® E / FE / KO Characteristics contact inserts

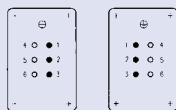
General Characteristics	Standard	Value			
Number of contacts		6 + ☺	10 + ☺	16 + ☺	24 + ☺
Termination technique		screw			
Wire gauge		0.25 mm ² - 2.5 mm ²			
Flammability	UL 94	V-0			
Electrical Characteristics					
Rated voltage	IEC 60664-1	500 V			
Pollution degree	IEC 60664-1	3			
Installation (overvoltage) category	IEC 60664-1	III			
Material group	IEC 60664-1	III b			
Current carrying capacity	IEC 60664-1	6 kV			
Rated current T _{amp} = 40 °C		10 A			
Contact resistance	IEC 60512-2-1	≤ 10 m Ω			
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					
IP-degree of protection pin insert ¹⁾	IEC 60529	unmated IP00		mated IP20	
IP-degree of protection socket insert ¹⁾	IEC 60529	unmated IP20		mated IP20	
Weight pin insert		45 g	60 g	78 g	105 g
Weight socket insert		45 g	60 g	78 g	105 g
Mechanical operation	IEC 60512-9-1	≥ 100 mating cycles			
Materials					
Insert		PA, GV (Polyamid)			
Colour insert		grey			
Contacts		iron; gal cd 4 constantan = without plating			

Description	Part Number	Drawing	Figure
Contact insert 6 + ⊕ with iron-constantan contacts			
Male insert with wire protection	C146 10A006 810 1		
Female insert with wire protection	C146 10B006 810 1		

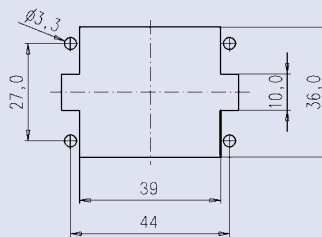
Pin layout

Assembly instruction

Male insert Female insert



Panel cut out (insert)

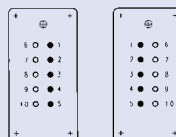


Description	Part Number	Drawing	Figure
Contact insert 10 + ⊕ with iron-constantan contacts			
Male insert with wire protection	C146 10A010 810 1		
Female insert with wire protection	C146 10B010 810 1		

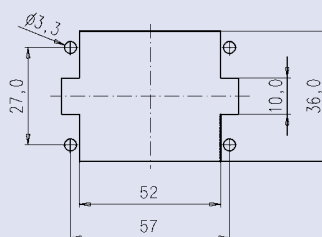
Pin layout

Assembly instruction

Male insert Female insert



Panel cut out (insert)



Description	Part Number	Drawing	Figure
Contact insert 16 + ⊕ with iron-constantan contacts			
Male insert with wire protection	C146 10A016 810 1		
Female insert with wire protection	C146 10B016 810 1		

Pin layout	Assembly instruction
<p>Male insert</p> <p>Female insert</p>	<p>Panel cut out (insert)</p>

Description	Part Number	Drawing	Figure
Contact insert 24 + ⊕ with iron-constantan contacts			
Male insert with wire protection	C146 10A024 810 1		
Female insert with wire protection	C146 10B024 810 1		

Pin layout	Assembly instruction
<p>Male insert</p> <p>Female insert</p>	<p>Panel cut out (insert)</p>