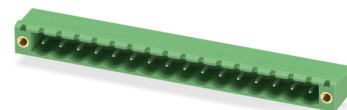


Item No.: 1776647

Type: MSTB 2,5/16-GF-5,08

PCB headers



## 1 Main features



- |                         |                     |                        |                     |
|-------------------------|---------------------|------------------------|---------------------|
| • No. of pos.           | 16                  | • Nominal current      | 12 A                |
| • Nominal cross section | 2.5 mm <sup>2</sup> | • Nominal voltage      | 320 V               |
| • Color                 | green (RAL 6021)    | • Connection direction | 0 °                 |
| • Pitch                 | 5.08 mm             | • Type of packaging    | packed in cardboard |
| • Mounting type         | Wave soldering      |                        |                     |

## 2 Your advantages

- ✓ Maximum flexibility when it comes to device design – one header for connectors with different connection technologies
- ✓ Easy PCB replacement thanks to plug-in modules
- ✓ Well-known mounting principle allows worldwide use
- ✓ Plug-in direction parallel to the PCB
- ✓ Screwable flange for superior mechanical stability



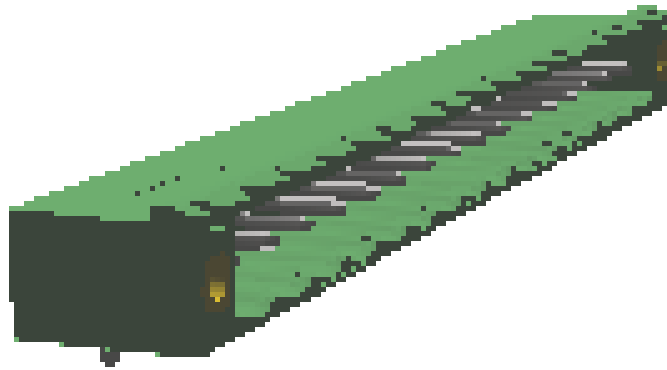
Make sure you always use the latest documentation.  
It can be downloaded at: [phoenixcontact.com/product/1776647](https://phoenixcontact.com/product/1776647)

**3 Table of contents**

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1776647 MSTB 2,5/16-GF-5,08

4 3D model in PDF can be activated (Acrobat Reader only)



**1776647 MSTB 2,5/16-GF-5,08****5 General Technical Data****5.1 item properties**

Item no.	1776647
Type	MSTB 2,5/16-GF-5,08
Product line	COMBICON Connectors M
Connector system	COMBICON MSTB 2,5
Product type	PCB headers
Contact connection type	Pin
Range of articles	MSTB 2,5/..-GF
Pitch	5.08 mm
Number of positions	16
Number of rows	1
Number of connections	16
Number of potentials	16
Connection direction of the connector to the PCB	0 °
Pin layout	Linear pinning
Solder pins per potential	1
Type	Standard

**1776647 MSTB 2,5/16-GF-5,08****6 Mounting****6.1 Flange mounting**

Type of locking	Screw locking mechanism
Mounting flange	Threaded flange
Tightening torque	0.3 Nm

**6.2 Mounting the PCB**

Screw	Sheet metal screw ISO 1481-ST 2,2x6,5 C or ISO 7049-ST 2,2x6,5 C
Tightening torque	0.3 Nm

**7 Material properties****7.1 Material of metal parts**

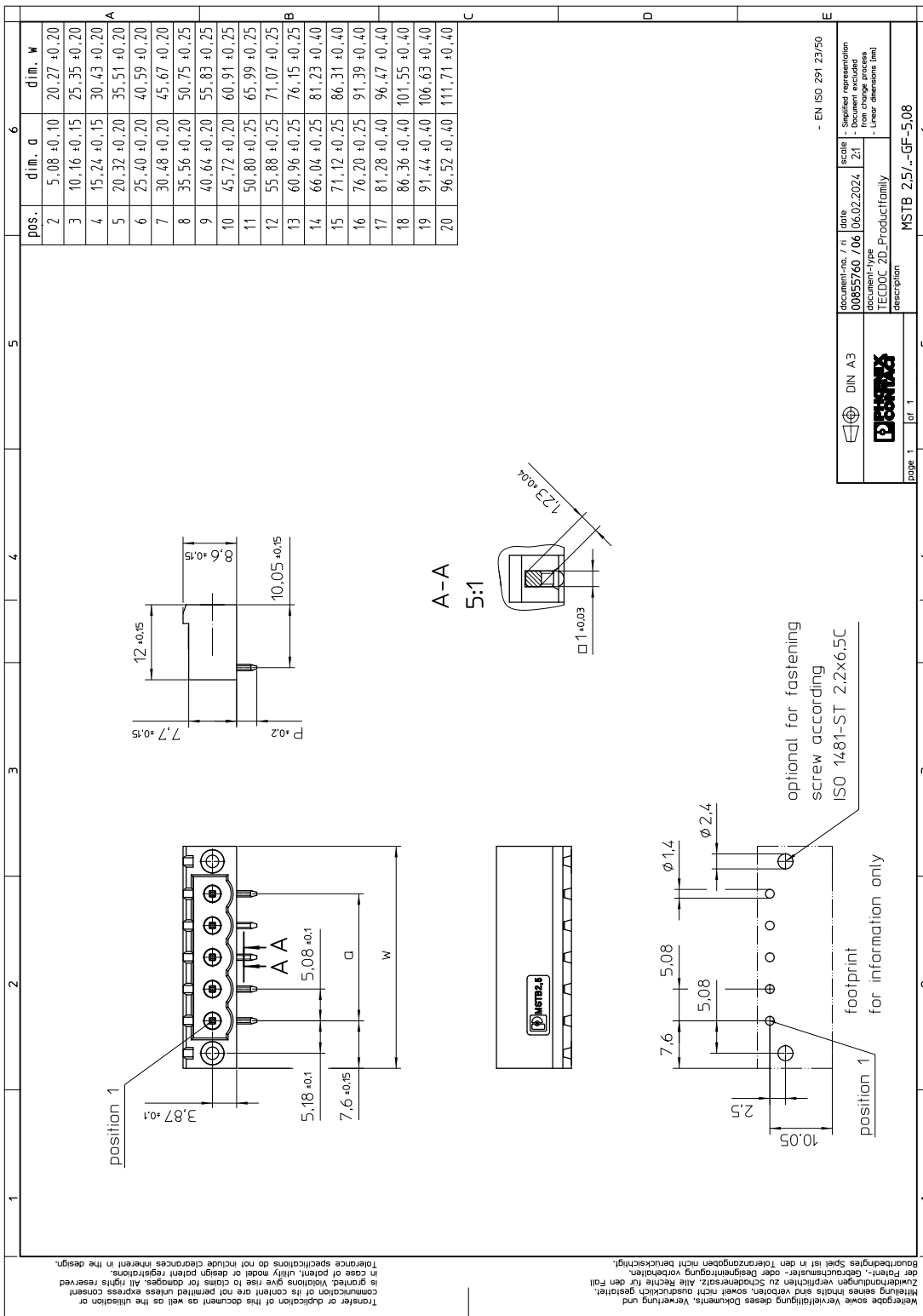
Note	WEEE/RoHS-compliant, whisker-free acc. to IEC 60068-2-82/JEDEC JESD 201
Contact material	Cu alloy
Surface contact area	Nickel (1.3 - 3 $\mu\text{m}$ Ni) , Tin (3 - 5 $\mu\text{m}$ Sn)
Soldering area surface	Nickel (1.3 - 3 $\mu\text{m}$ Ni) , Tin (3 - 5 $\mu\text{m}$ Sn)
Surface characteristics	Tin-plated
Insulating material data	Housing
Color	green (RAL 6021)
Insulating material	PBT
Insulating material group	IIIa
CTI according to IEC 60112	225
Flammability rating according to UL 94	V0

**1776647 MSTB 2,5/16-GF-5,08****8 Dimensions****8.1 Dimensions for the product**

Length	12 mm
Width	91.44 mm
Height (without solder pin)	8.57 mm
Total height	11.8 mm
Solder pin [P]	3.23 mm

1776647 MSTB 2,5/16-GF-5,08

9 Series drawing



**1776647 MSTB 2,5/16-GF-5,08****10 Product notes****10.1 General information**

Notes on operation

In accordance with IEC 61984, COMBICON connectors have no switching power (COC). During designated use, they must not be plugged in or disconnected when carrying voltage or under load.

**11 Application****12 Packaging specifications**

Type of packaging	packed in cardboard
-------------------	---------------------

Packing unit	50
--------------	----

**12.1 Temperature limit values**

Ambient temperature (storage/transport)	-40 °C ... 70 °C
---	------------------

Relative humidity (storage/transport)	30 % ... 70 %
---------------------------------------	---------------

Ambient temperature (assembly)	-5 °C ... 100 °C
--------------------------------	------------------

Ambient temperature (operation)	-40 °C ... 105 °C (dependent on the derating curve)
---------------------------------	---

**1776647 MSTB 2,5/16-GF-5,08****13 Mechanical tests****13.1 Visual examination**

Specification	IEC 61984:2008-10
Visual examination	Test passed
Specification	IEC 60512-1-1:2002-02

**13.2 Dimensional test**

Dimensional test	Test passed
Specification	IEC 60512-1-2:2002-02

**13.3 Resistance of marking**

Resistance of marking	Test passed
Specification	IEC 60068-2-70:1995-12

**13.4 Polarization and coding**

Polarization and coding	Test passed
Specification	IEC 60512-13-5:2006-02
Test force	20 N

**13.5 Contact retention in insert**

Contact holder in insert Requirements >20 N	Test passed
Specification	IEC 60512-15-1:2008-05

**1776647 MSTB 2,5/16-GF-5,08****14 Insertion and withdrawal forces**

Insertion and withdrawal force	
Specification	Test passed
No. of cycles	25
Insertion strength per pos. approx.	8 N
Withdraw strength per pos. approx.	6 N

**1776647 MSTB 2,5/16-GF-5,08****15 Electrical tests**

Rated current / conductor cross section	12 A / 2.5 mm <sup>2</sup>
Rated insulation voltage (III/2)	320 V
Rated surge voltage (III/2)	4 kV
Contact resistance	1 mΩ
Degree of pollution	2

**1776647 MSTB 2,5/16-GF-5,08****16 Air and creepage distances**

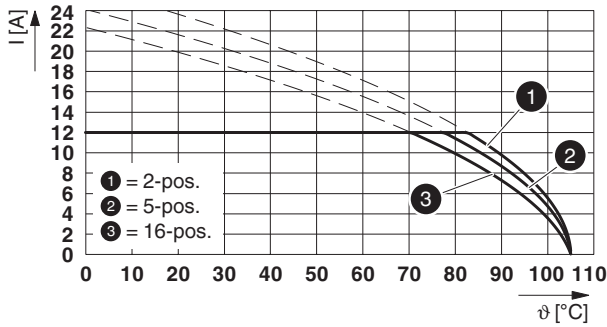
Component	PCB headers		
Specification	IEC 60664-1:2007-04		
Mains type	unearthed mains		
Insulating material group	IIIa		
Comparative tracking index (IEC 60112)	CTI 225		
Rated insulation voltage	250 V	320 V	400 V
Rated surge voltage	4 kV	4 kV	4 kV
Degree of pollution	3	2	2
Overvoltage category	III	III	II
Minimum clearance case A (inhomogeneous field)	3 mm	3 mm	3 mm
Minimum value of the creepage path requirement in acc. with table	4 mm	3.2 mm	4 mm

1776647 MSTB 2,5/16-GF-5,08

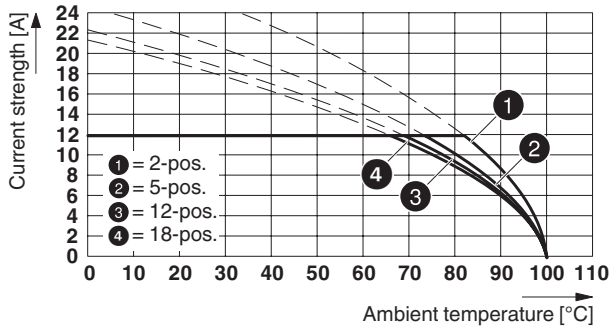
17 Current carrying capacity/derating curves

Specification	IEC 61984:2008-10
Note	Representation based on IEC 60512-5-2:2002-02
Note	For number of positions, see diagram
Reduction factor	0.8
Conductor cross section	2.5 mm <sup>2</sup>

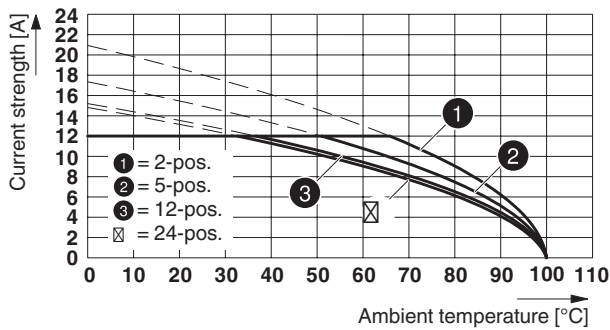
Type: FKCS 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08



Type: FKCT 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08

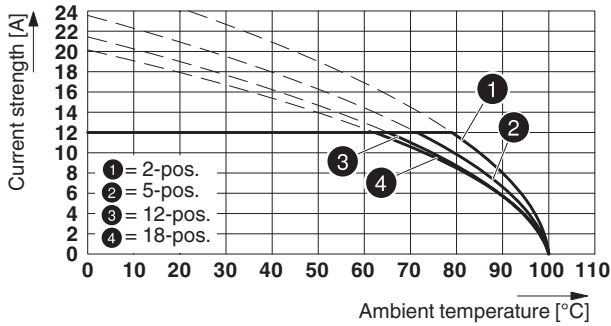


Type: MVSTBR 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08

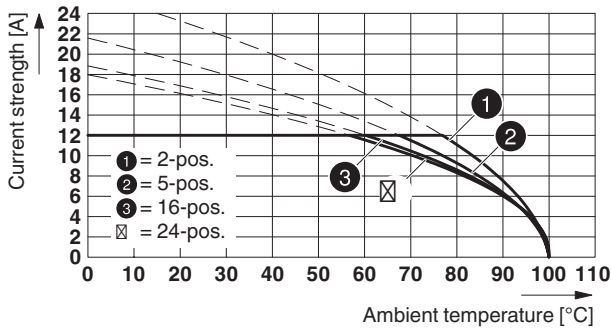


1776647 MSTB 2,5/16-GF-5,08

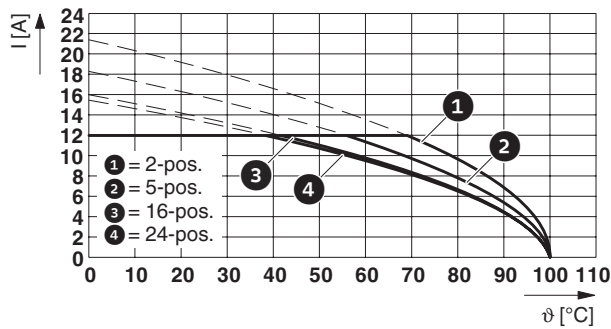
Type: MSTBT 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08



Type: FRONT-MSTB 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08

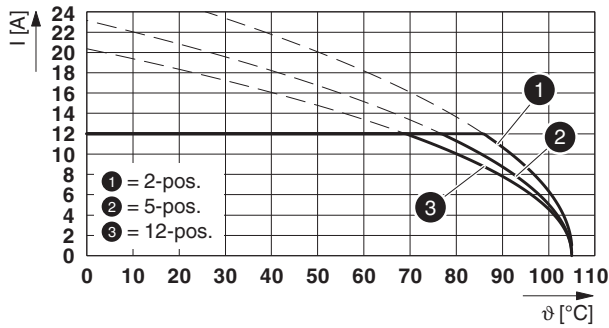


Type: SMSTB 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08

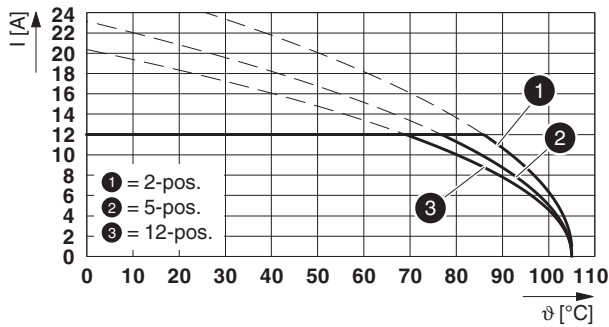


1776647 MSTB 2,5/16-GF-5,08

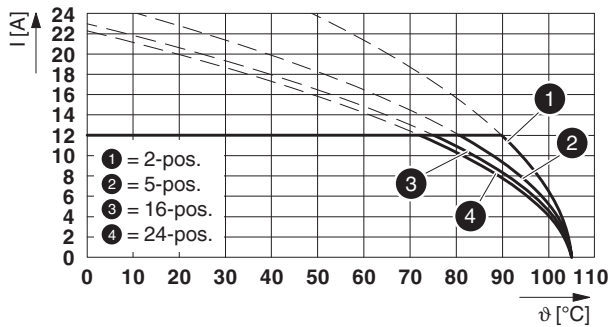
Type: FKCVR 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08



Type: FKCVW 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08

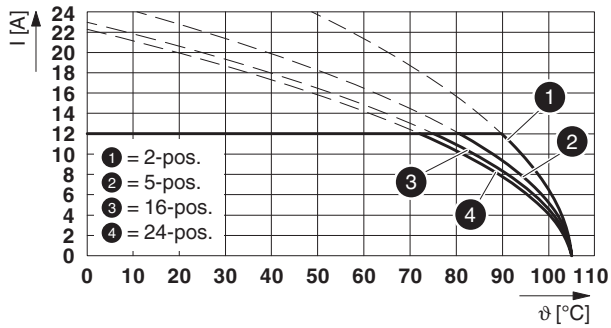


Type: FKCO(R/W) 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08

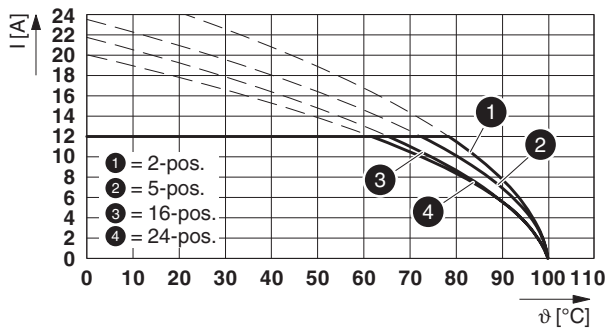


1776647 MSTB 2,5/16-GF-5,08

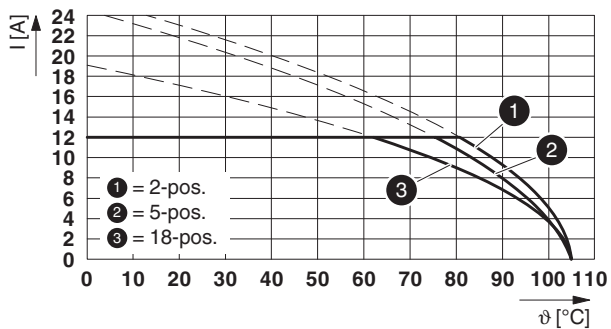
Type: FKCO(R/W) 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08



Type: FKC 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08



Type: FKCN 2,5/...-STF-5,08 with MSTB 2,5/...-GF-5,08



**1776647 MSTB 2,5/16-GF-5,08****18 Environmental and durability tests****18.1 Vibration test**

Specification	IEC 60068-2-6:2007-12
Result	Test passed
Frequency	10 - 150 - 10 Hz
Sweep speed	1 octave/min
Amplitude	0.35 mm (10 Hz ... 60.1 Hz)
Acceleration	5g (60.1 Hz ... 150 Hz)
Test duration per axis	2.5 h
Test directions	X-, Y- and Z-axis
Note	

**18.2 Insulation resistance**

Specification	IEC 60512-3-1:2002-02
Result	Test passed
Insulation resistance, neighboring positions	> 5 MΩ





**1776647 MSTB 2,5/16-GF-5,08**

---

## **19 Data transmission**

## 1776647 MSTB 2,5/16-GF-5,08

## 20 Approvals / Certificates

CSA 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
<b>Usegroup B</b>				
	300 V	10 A	-	-
<b>Usegroup D</b>				
	300 V	10 A	-	-
cULus Recognized 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
<b>Usegroup B</b>				
	300 V	15 A	-	-
<b>Usegroup D</b>				
	300 V	10 A	-	-
DNV GL 				
VDE Zeichengenehmigung 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
	250 V	12 A	-	-

**1776647 MSTB 2,5/16-GF-5,08****21 Commercial Data**

Item no.	1776647
Type	MSTB 2,5/16-GF-5,08
Packing unit	50
Net weight	7.703 g
GTIN	4017918038816
	Information that applies locally, see link on page 1

**22 corresponding plugs**

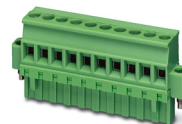
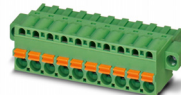
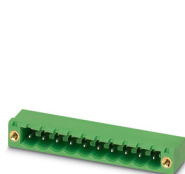
Item no.	Type
1754937	FKCN 2,5/16-STF-5,08
1777934	FRONT-MSTB 2,5/16-STF-5,08
1778124	MSTB 2,5/16-STF-5,08
1805437	MSTBT 2,5/16-STF-5,08
1809873	MSTBC 2,5/16-STZF-5,08
1835041	MVSTBW 2,5/16-STF-5,08
1835232	MVSTBR 2,5/16-STF-5,08
1873346	FKC 2,5/16-STF-5,08
1873948	FKCVW 2,5/16-STF-5,08
1874248	FKCVR 2,5/16-STF-5,08
1883899	QC 1/16-STF-5,08
1902440	FKCT 2,5/16-STF-5,08
1971206	SMSTB 2,5/16-STF-5,08
1975406	FKCS 2,5/16-STF-5,08

**23 Accessories**

Description	Item No.	Type
Keying cap, for forming sections, plugs onto header pin, green insulating material	1755477	MSTB-BL
	0804293	SK 5,08/3,8:FORTL.ZAHLEN
Coding section, inserted into the recess in the header or the inverted plug, red insulating material	1734401	CR-MSTB

## 1776647 MSTB 2,5/16-GF-5,08

## 24 Combination tests

**MSTB 2,5/16-GF****FKCS 2,5/16-STF****FKCT 2,5/16-STF****MVSTBR 2,5/16-STF****MSTBT 2,5/16-STF**

IEC 61984

IEC 61984

IEC 61984

IEC 61984

IEC 61984

**Mechanical tests (A)**

Insertion/withdrawal force per position

approx. 8 N / 6 N

approx. 8 N / 6 N

approx. 8 N / 6 N

approx. 8 N / 6 N

Polarization when inserted  
Requirement >20 N

Test passed

Test passed

Test passed

Test passed

Contact holder in insert  
Requirements >20 N

Test passed

Test passed

Test passed

Test passed

**Durability tests (B)**Contact resistance R<sub>1</sub> 1st level

1 mΩ

1.2 mΩ

2.4 mΩ

1.2 mΩ

Contact resistance R<sub>1</sub> 2nd level

Insertion/withdrawal cycles

25

25

25

25

Contact resistance R<sub>2</sub>

1 mΩ

1.2 mΩ

2.4 mΩ

1.2 mΩ

Rated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

2.21 kV

2.21 kV

Insulation resistance  
Requirements > 5 MΩ

&gt; 5 MΩ

&gt; 5 MΩ

&gt; 5 MΩ

&gt; 5 MΩ

**Thermal tests (C)**

Tested number of positions

16

18

24

18

Tested conductor cross section

2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>

Test current

12 A

12 A

12 A DC

12 A

Upper limiting temperature  
Requirements < 100°C

Test passed

Test passed

Test passed

Test passed

**Climatic tests (D)**

Test sequence 1: low temperature storage

-40 °C/2 h

-40 °C/2 h

-40 °C/2 h

-40 °C/2 h

Test sequence 2: heat storage

105 °C/168 h

100 °C/168 h

100 °C/168 h

100 °C/168 h

Test sequence 3: noxious gas storage

0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycleRated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

2.21 kV

2.21 kV

**Environmental and endurance tests (E)**

Specification

IEC 61984:2008-10

IEC 61984:2008-10

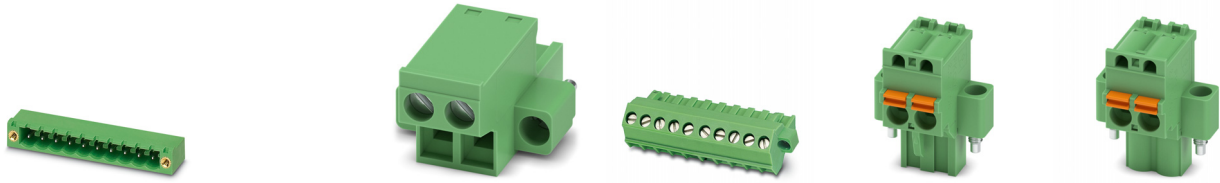
IEC 61984:2008-10

IEC 61984:2008-10

Degree of protection

Finger safety with IP20  
test fingerFinger safety with IP20  
test fingerFinger safety with IP20  
test fingerFinger safety with IP20  
test finger

## 1776647 MSTB 2,5/16-GF-5,08

**MSTB 2,5/16-GF****FRONT-MSTB 2,5/16-STF****SMSTB 2,5/16-STF****FKCVR 2,5/16-STF****FKCVW 2,5/16-STF**

IEC 61984

IEC 61984

IEC 61984

IEC 61984

IEC 61984

**Mechanical tests (A)**

Insertion/withdrawal force per position

approx. 8 N / 6 N

approx. 8 N / 6 N

approx. 14 N / 11 N

approx. 14 N / 11 N

Polarization when inserted  
Requirement >20 N

Test passed

Test passed

Test passed

Test passed

Contact holder in insert  
Requirements >20 N

Test passed

Test passed

Test passed

Test passed

**Durability tests (B)**Contact resistance R<sub>1</sub> 1st level

1.4 mΩ

2.3 mΩ

1.2 mΩ

1.2 mΩ

Contact resistance R<sub>1</sub> 2nd level

Insertion/withdrawal cycles

25

25

25

25

Contact resistance R<sub>2</sub>

1.4 mΩ

2.3 mΩ

1.2 mΩ

1.2 mΩ

Rated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

2.21 kV

2.21 kV

Insulation resistance  
Requirements > 5 MΩ

&gt; 5 MΩ

&gt; 5 MΩ

&gt; 5 MΩ

&gt; 5 MΩ

**Thermal tests (C)**

Tested number of positions

24

24

16

16

Tested conductor cross section

2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>

Test current

12 A

12 A

12 A

12 A

Upper limiting temperature  
Requirements < 100°C

Test passed

Test passed

Test passed

Test passed

**Climatic tests (D)**

Test sequence 1: low temperature storage

-40 °C/2 h

-40 °C/2 h

-40 °C/2 h

-40 °C/2 h

Test sequence 2: heat storage

100 °C/168 h

100 °C/168 h

105 °C/168 h

105 °C/168 h

Test sequence 3: noxious gas storage

0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycleRated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

2.21 kV

2.21 kV

**Environmental and endurance tests (E)**

Specification

IEC 61984:2008-10

IEC 61984:2008-10

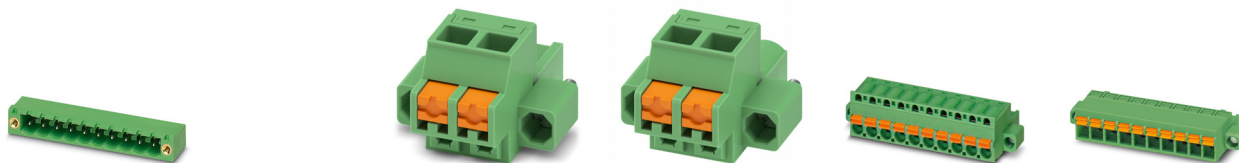
IEC 61984:2008-10

IEC 61984:2008-10

Degree of protection

Finger safety with IP20  
test fingerFinger safety with IP20  
test fingerFinger safety with IP20  
test fingerFinger safety with IP20  
test finger

## 1776647 MSTB 2,5/16-GF-5,08



MSTB 2,5/16-GF	FKCOR 2,5/16-STF	FKCOW 2,5/16-STF	FKC 2,5/16-STF	FKCN 2,5/16-STF
IEC 61984	IEC 61984	IEC 61984	IEC 61984	IEC 61984
<b>Mechanical tests (A)</b>				
Insertion/withdrawal force per position	approx. 10 N / 11 N	approx. 10 N / 11 N	approx. 8 N / 6 N	approx. 8 N / 6 N
Polarization when inserted Requirement >20 N	Test passed	Test passed	Test passed	Test passed
Contact holder in insert Requirements >20 N	Test passed	Test passed	Test passed	Test passed
<b>Durability tests (B)</b>				
Contact resistance R <sub>1</sub> 1st level	1.1 mΩ	1.1 mΩ	1 mΩ	1.1 mΩ
Contact resistance R <sub>1</sub> 2nd level				
Insertion/withdrawal cycles	25	25	25	25
Contact resistance R <sub>2</sub>	1.1 mΩ	1.1 mΩ	1 mΩ	1.1 mΩ
Rated impulse voltage at sea level Voltage waveform ≥ (1.2/50 μs)	4.8 kV	4.8 kV	4.8 kV	4.8 kV
Power-frequency withstand voltage Voltage waveform ≥ (50/60 Hz)	2.21 kV	2.21 kV	2.21 kV	2.21 kV
Insulation resistance Requirements > 5 MΩ	> 5 MΩ	> 5 MΩ	> 5 MΩ	> 5 MΩ
<b>Thermal tests (C)</b>				
Tested number of positions	24	24	24	18
Tested conductor cross section	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
Test current	12 A	12 A	12 A	12 A
Upper limiting temperature Requirements < 100°C	Test passed	Test passed	Test passed	Test passed
<b>Climatic tests (D)</b>				
Test sequence 1: low temperature storage	-40 °C/2 h	-40 °C/2 h	-40 °C/2 h	-40 °C/2 h
Test sequence 2: heat storage	105 °C/168 h	105 °C/168 h	105 °C/168 h	105 °C/168 h
Test sequence 3: noxious gas storage	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle
Rated impulse voltage at sea level Voltage waveform ≥ (1.2/50 μs)	4.8 kV	4.8 kV	4.8 kV	4.8 kV
Power-frequency withstand voltage Voltage waveform ≥ (50/60 Hz)	2.21 kV	2.21 kV	2.21 kV	2.21 kV
<b>Environmental and endurance tests (E)</b>				
Specification	IEC 61984:2008-10	IEC 61984:2008-10	IEC 61984:2008-10	IEC 61984:2008-10
Degree of protection	Finger safety with IP20 test finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger