

# Data sheet

Order No.: 1778166

Type: MSTB 2,5/20-STF-5,08

Plug component, Screw connection with tension sleeve



The figure shows a 10-position version of the product

## 1 Main features



|                           |                                      |                        |                     |
|---------------------------|--------------------------------------|------------------------|---------------------|
| • No. of pos.             | 20                                   | • Nominal current      | 12 A                |
| • Conductor cross section | 2.5 mm <sup>2</sup>                  | • Nominal voltage      | 320 V               |
| • Color                   | green                                | • Connection direction | 0 °                 |
| • Pitch                   | 5.08 mm                              | • Type of packaging    | packed in cardboard |
| • Connection method       | Screw connection with tension sleeve |                        |                     |

## 2 Your advantages

- ✓ Well-known connection principle allows worldwide use
- ✓ Low temperature rise, thanks to maximum contact force
- ✓ Screwable flange for superior mechanical stability
- ✓ Allows connection of two conductors



Make sure you always use the latest documentation.

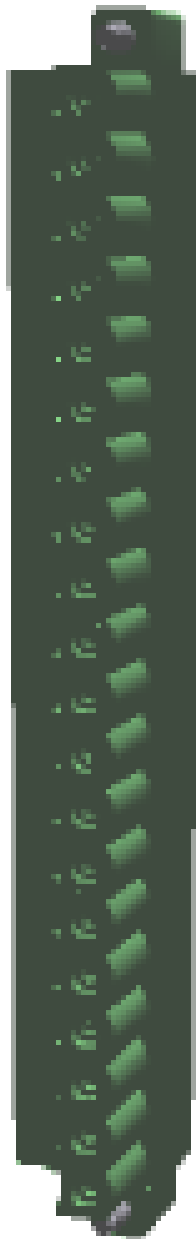
It can be downloaded at: [phoenixcontact.net/product/1778166](http://phoenixcontact.net/product/1778166)

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1778166 MSTB 2,5/20-STF-5,08

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



**1778166 MSTB 2,5/20-STF-5,08****5 item properties**

|                       |                                      |
|-----------------------|--------------------------------------|
| Order No.             | 1778166                              |
| Type                  | MSTB 2,5/20-STF-5,08                 |
| Type of contact       | Female connector                     |
| Range of articles     | MSTB 2,5/...STF                      |
| Pitch                 | 5.08 mm                              |
| Number of positions   | 20                                   |
| Connection method     | Screw connection with tension sleeve |
| Drive form screw head | Slotted                              |
| Screw thread          | M3                                   |
| Tightening torque     | 0.5 Nm ... 0.6 Nm                    |
| Locking               | Screw flange                         |

**5.1 Connection capacity**

|  |   |
|--|---|
| Conductor cross section, solid   | 0.2 mm <sup>2</sup> to 2.5 mm <sup>2</sup>  |
| Conductor cross section, flexible  | 0.2 mm <sup>2</sup> to 2.5 mm <sup>2</sup>  |
| Conductor cross section AWG/kcmil  | 24 to 12                                    |
| 2 conductors with same cross section, solid  | 0.2 mm <sup>2</sup> to 1 mm <sup>2</sup>    |
| 2 conductors with same cross section, stranded   | 0.2 mm <sup>2</sup> to 1.5 mm <sup>2</sup>  |
| Conductor cross section flexible, with ferrule without plastic sleeve                  | 0.25 mm <sup>2</sup> to 2.5 mm <sup>2</sup> |
| Conductor cross section flexible, with ferrule with plastic sleeve                     | 0.25 mm <sup>2</sup> to 2.5 mm <sup>2</sup> |
| 2 conductors with same cross section, stranded, with ferrule without plastic sleeve    | 0.25 mm <sup>2</sup> to 1 mm <sup>2</sup>   |
| 2 conductors with same cross section, stranded, with TWIN ferrules with plastic sleeve | 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup>  |
| Cylindrical gauge a x b / diameter   | 2.8 mm x 2.4 mm / 2.5 mm                    |
| Stripping length   | 7 mm  |

**5.2 Material data**

|   |   |
|---|---|
| <b>Material of metal parts</b>                                    |   |
| Note  | WEEE/RoHS-compliant, whisker-free acc. to IEC 60068-2-82/JEDEC JESD 201 |
| Contact material  | Cu alloy  |
| Terminal point surface  | Sn 5 µm ... 7 µm  |
| Surface contact area  | Sn 5 µm ... 7 µm  |
| Surface characteristics   | hot-dip tin-plated  |
| <b>Insulating material data</b>                                   |   |
| Insulating material   | PA  |
| CTI according to IEC 60112  | 600   |
| Flammability rating according to UL 94                            | V0  |
| Color   | green (6021)  |
| Glow wire flammability index GWFI according to EN 60695-2-12      | 850   |
| Glow wire ignition temperature GWIT according to EN 60695-2-13    | 775   |
| Temperature for the ball pressure test according to EN 60695-10-2 | 125 °C  |

**6 Dimensions**

**1778166 MSTB 2,5/20-STF-5,08**

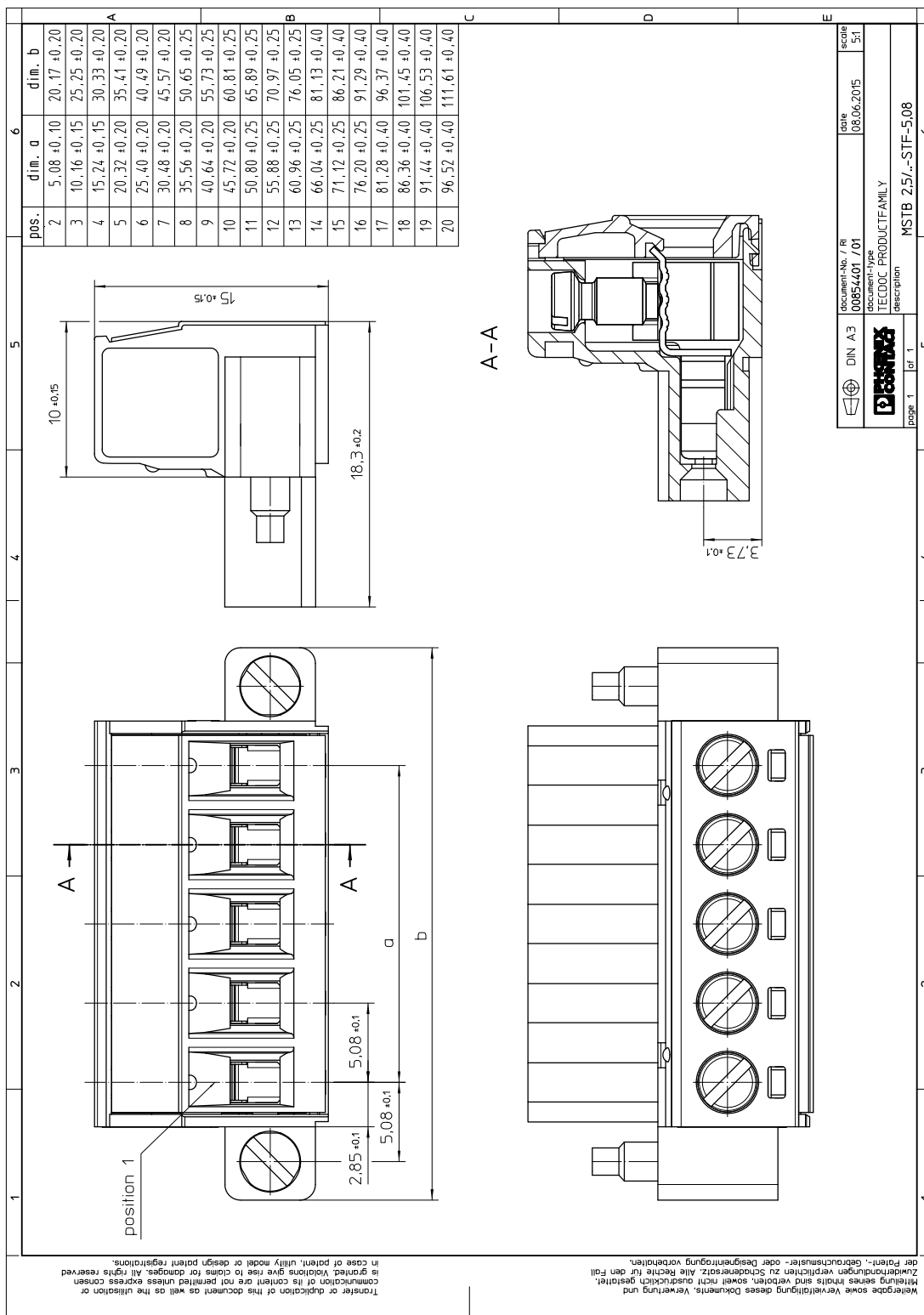
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**6.1 Dimensions for the product**

|              |           |
|--------------|-----------|
| Length       | 18.3 mm   |
| Width        | 111.61 mm |
| Total height | 15 mm     |
| Dimension a  | 96.52 mm  |

1778166 MSTB 2,5/20-STF-5,08

7 Series drawing



**1778166 MSTB 2,5/20-STF-5,08****8 Packaging information**

|                    |                     |
|--------------------|---------------------|
| Type of packaging  | packed in cardboard |
| Pieces per package | 50                  |

**9 Application****9.1 Temperature limit values**

|   |  |
|---|--|
| Ambient temperature (storage/transport) | -40 °C ... 70 °C                         |
| Ambient temperature (assembly)          | -5 °C ... 100 °C                         |
| Ambient temperature (operation)         | -40 °C (dependent on the derating curve) |

**1778166 MSTB 2,5/20-STF-5,08****10 Mechanical tests**

| Mechanical test group A             |                        |
|-------------------------------------|------------------------|
| Specification                       | IEC 61984:2008-10      |
| Visual test                         | Test passed            |
| Specification                       | IEC 60512-1-1:2002-02  |
| Dimensional test                    | Test passed            |
| Specification                       | IEC 60512-1-2:2002-02  |
| Resistance of marking               | Test passed            |
| Specification                       | IEC 60068-2-70:1995-12 |
| Insertion and withdrawal force      | Test passed            |
| Specification                       | IEC 60512-13-2:2006-02 |
| No. of cycles                       | 25                     |
| Insertion strength per pos. approx. | 8 N                    |
| Withdraw strength per pos. approx.  | 6 N                    |
| Polarization and coding             | Test passed            |
| Specification                       | IEC 60512-13-5:2006-02 |
| Test force                          | 20 N                   |
| Contact retention in insert         | Test passed            |
| Specification                       | IEC 60512-15-1:2008-05 |
| Test force per pos.                 | 27 N                   |

**10.1 Termination and connection method**

|  |                     |
|--|---------------------|
| Specification                              | IEC 60999-1:1999-11 |
| Check for damage to conductor or loosening | Test passed         |

**10.2 Pull-out test**

| Termination and connection method: pull-out test                   |   |
|--|---|
| Specification  | IEC 60999-1:1999-11                     |
| Result   | Test passed                             |
| Conductor cross section/conductor type/tractive force actual value | 0.2 mm <sup>2</sup> / solid / > 10 N    |
| Conductor cross section/conductor type/tractive force actual value | 0.2 mm <sup>2</sup> / stranded / > 10 N |
| Conductor cross section/conductor type/tractive force actual value | 2.5 mm <sup>2</sup> / solid / > 50 N    |
| Conductor cross section/conductor type/tractive force actual value | 2.5 mm <sup>2</sup> / stranded / > 50 N |
| Conductor cross section/conductor type/tractive force actual value | AWG 12 / stranded / > 60 N              |

**1778166 MSTB 2,5/20-STF-5,08****11 Electrical tests****11.1 Electrical data**

|   |                            |
|---|----------------------------|
| 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                      | 1.3 mΩ                     |
| Degree of pollution                     | 2                          |

**11.2 Air and creepage distances**

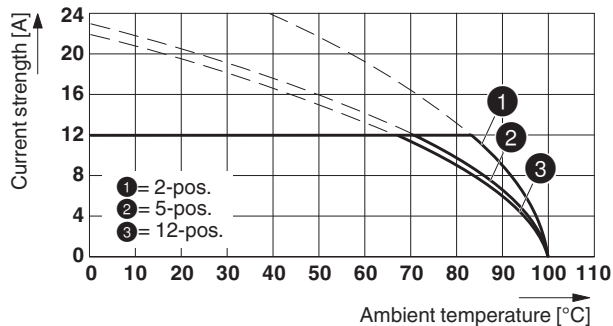
|   |                     |       |        |
|---|---------------------|-------|--------|
| Component   | Plug component      |       |        |
| Specification   | IEC 60664-1:2007-04 |       |        |
| Mains type  | unearthed mains     |       |        |
| Insulating material group   | I                   |       |        |
| Comparative tracking index (IEC 60112:2003-01)                    | CTI 600             |       |        |
| Rated insulation voltage  | 250 V               | 320 V | 630 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 | 3.2 mm              | 3 mm  | 3.2 mm |

1778166 MSTB 2,5/20-STF-5,08

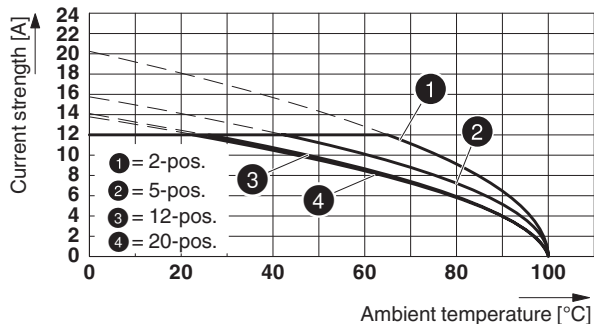
12 Current carrying capacity/derating curves

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

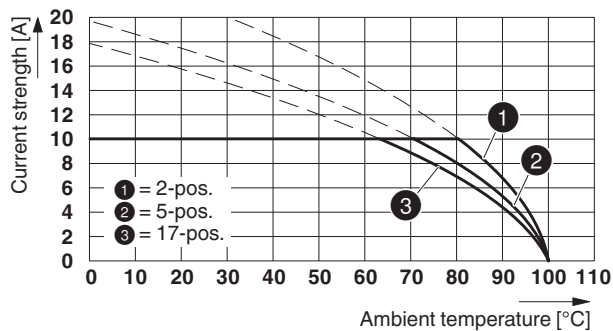
Type: MSTB 2,5/...-STF-5,08 with CC 2,5/...-GF-5,08 P26THR



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

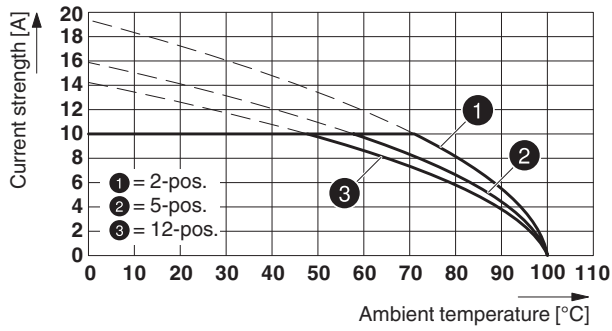


Type: MSTB 2,5/...-STF-5,08 with MDSTB 2,5/...-GF-5,08



**1778166 MSTB 2,5/20-STF-5,08**

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



**Type: MSTB 2,5/...-STF-5,08 with CCV 2,5/...-GF-5,08 P26THR**

88500\_1000\_en

**1778166 MSTB 2,5/20-STF-5,08**

**13 Environmental and durability tests**

**13.1 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 - 60.1 Hz) |
| Acceleration           | 5 g (60.1 - 150 Hz)    |
| Test duration per axis | 2.5 h                  |
| Test directions        | X-, Y- and Z-axis      |

**14 Classification for connectors**

|                                   |  |
|-----------------------------------|--|
| Specification                     | IEC 61984:2008-10                            |
| Main features                     | Connectors without switching capacity (COC)  |
| Construction form                 | Fixed connectors                             |
| Strain relief elements            | without strain relief                        |
| Connection method                 | Can be reconnected                           |
| Protection against electric shock | Not encapsulated - touch-proof when inserted |
| Protective conductor              | without PE                                   |
| Lock                              | no   |
| Connection method                 | Screw terminal points                        |

**15 Approvals**

|                            |       |       |  |  |
|----------------------------|-------|-------|--|--|
| <b>CSA</b>                 |       |       |  |  |
| Use group                  | B     | D     |  |  |
| mm <sup>2</sup> /AWG/kcmil | 28-12 | 28-12 |  |  |
| Voltage                    | 300 V | 300 V |  |  |
| Current                    | 10 A  | 10 A  |  |  |


|  |         |  |  |  |
|--|---------|--|--|--|
| <b>VDE Gutachten mit Fertigungsüberwachung</b> |         |  |  |  |
| mm <sup>2</sup> /AWG/kcmil                     | 0.2-2.5 |  |  |  |
| Voltage  | 250 V   |  |  |  |
| Current  | 12 A    |  |  |  |

|           |  |  |  |  |
|-----------|--|--|--|--|
| <b>RS</b> |  |  |  |  |
|-----------|--|--|--|--|

|                            |         |  |  |  |
|----------------------------|---------|--|--|--|
| <b>IECEE CB Scheme</b>     |         |  |  |  |
| mm <sup>2</sup> /AWG/kcmil | 0.2-2.5 |  |  |  |
| Voltage                    | 250 V   |  |  |  |
| Current                    | 12 A    |  |  |  |

|                         |   |   |  |  |
|-------------------------|---|---|--|--|
| <b>cULus Recognized</b> |   |   |  |  |
| Use group               | B | D |  |  |

**1778166 MSTB 2,5/20-STF-5,08**

|  |       |       |  |  |
|--|-------|-------|--|--|
| cULus Recognized  |       |       |  |  |
| mm <sup>2</sup> /AWG/kcmil   | 30-12 | 30-12 |  |  |
| Voltage  | 300 V | 150 V |  |  |
| Current  | 15 A  | 15 A  |  |  |

EAC 

DNV GL

**1778166 MSTB 2,5/20-STF-5,08****16 Commercial Data**

|                    |  |
|--------------------|--|
| Order No.          | 1778166  |
| Type               | MSTB 2,5/20-STF-5,08                                 |
| Pieces per package | 50   |
| Net weight         | 34.186 g   |
| GTIN               | 4017918040031  |
|                    | Information that applies locally, see link on page 1 |
| Country of origin  | Information that applies locally, see link on page 1 |

**17 corresponding headers**



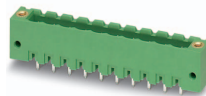
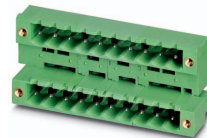
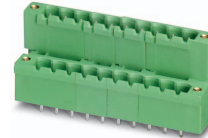
| Order No. | Type                  |
|-----------|-----------------------|
| 1776689   | MSTB 2,5/20-GF-5,08   |
| 1777251   | MSTBV 2,5/20-GF-5,08  |
| 1899799   | EMSTB 2,5/20-GF-5,08  |
| 1915877   | EMSTBV 2,5/20-GF-5,08 |

**18 Accessories**

| Description  | Order No. | Type                     |
|--|-----------|--------------------------|
| Actuation tool, for ST terminal blocks, insulated, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip | 1205053   | SZS 0,6X3,5              |
|  | 0804293   | SK 5,08/3,8:FORTL.ZAHLEN |
|  | 0803906   | SK U/3,8 WH:UNBEDRUCKT   |
|  | 0805085   | SK 5,08/3,8:SO           |
| Coding profile, is inserted into the slot on the plug or inverted header, red insulating material  | 1734634   | CP-MSTB                  |
| Marker pen, for manual labeling of unprinted Zack strips, smear-proof and waterproof, line thickness 0.5 mm  | 1051993   | B-STIFT                  |
| Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm  | 0811228   | X-PEN 0,35               |

## 1778166 MSTB 2,5/20-STF-5,08

## 19 Combination tests

|  |  |  |  |  |  |
|--|---|---|---|--|---|
|  | <b>MSTB 2,5/...-STF</b>   | <b>CC 2,5/...-GF</b>  | <b>MSTBV 2,5/...-GF</b>   | <b>MDSTB 2,5/...-GF</b>  | <b>MDSTBV 2,5/...-GF</b>  |
| Specification  |   | IEC 61984   | IEC 61984   | IEC 61984  | IEC 61984   |
| <b>Mechanical tests (A)</b>  |   |   |   |  |   |
| 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<br>Requirement >20 N                      |   | Test passed   | Test passed   | Test passed  | Test passed   |
| Contact holder in insert<br>Requirements >20 N                       |   | Test passed   | Test passed   | Test passed  | Test passed   |
| <b>Durability tests (B)</b>  |   |   |   |  |   |
| Contact resistance R <sub>1</sub>                                    |   | 1.3 mΩ  | 2.5 mΩ  | 1.6 mΩ   | 2.5 mΩ  |
| Insertion/withdrawal cycles  |   | 25  | 25  | 25   | 25  |
| Contact resistance R <sub>2</sub>                                    |   | 1.4 mΩ  | 2.6 mΩ  | 1.6 mΩ   | 2.5 mΩ  |
| Rated impulse voltage at sea level<br>Voltage waveform ≥ (1.2/50 μs) |   | 4.8 kV  | 4.8 kV  | 4.8 kV   | 4.8 kV  |
| Power-frequency withstand voltage<br>Voltage waveform ≥ (50/60 Hz)   |   | 2.21 kV   | 2.21 kV   | 2.21 kV  | 2.21 kV   |
| Insulation resistance<br>Requirements > 5 MΩ                         |   | > 2 TΩ  | > 3 TΩ  | > 0.1 TΩ   | > 0.2 TΩ  |
| <b>Thermal tests (C)</b>   |   |   |   |  |   |
| Tested number of positions   |   | 12  | 20  | 17   | 12  |
| 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  | 10 A  | 10 A   | 10 A  |
| Upper limiting temperature<br>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  |   | 100 °C/168 h  | 100 °C/168 h  | 100 °C/168 h   | 100 °C/168 h  |
| Test sequence 3: noxious gas storage<br>(ISO 6988)                   |   | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /<br>40 °C/1 cycle     | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /<br>40 °C/1 cycle     | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /<br>40 °C/1 cycle      | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /<br>40 °C/1 cycle       |
| Rated impulse voltage at sea level<br>Voltage waveform ≥ (1.2/50 μs) |   | 4.8 kV  | 4.8 kV  | 4.8 kV   | 4.8 kV  |
| Power-frequency withstand voltage<br>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<br>test finger  | Finger safety with IP20<br>test finger  | Finger safety with IP20<br>test finger   | Finger safety with IP20<br>test finger  |

**1778166 MSTB 2,5/20-STF-5,08****MSTB 2,5/..-STF**

Specification

**Mechanical tests (A)**

Insertion/withdrawal force per position

Polarization when inserted  
Requirement >20 NContact holder in insert  
Requirements >20 N**Durability tests (B)**Contact resistance  $R_1$ 

Insertion/withdrawal cycles

Contact resistance  $R_2$ Rated impulse voltage at sea level  
Voltage waveform  $\geq (1.2/50 \mu\text{s})$ Power-frequency withstand voltage  
Voltage waveform  $\geq (50/60 \text{ Hz})$ Insulation resistance  
Requirements > 5 M $\Omega$ **Thermal tests (C)**

Tested number of positions

Tested conductor cross section

Test current

Upper limiting temperature  
Requirements < 100°C**Climatic tests (D)**

Test sequence 1: low temperature storage

Test sequence 2: heat storage

Test sequence 3: noxious gas storage  
(ISO 6988)Rated impulse voltage at sea level  
Voltage waveform  $\geq (1.2/50 \mu\text{s})$ Power-frequency withstand voltage  
Voltage waveform  $\geq (50/60 \text{ Hz})$ **Environmental and endurance tests (E)**

Specification

Degree of protection

**CCV 2,5/..-GF**

IEC 61984

approx. 8 N / 6 N

Test passed

Test passed

1.3 m $\Omega$ 

25

1.3 m $\Omega$ 

4.8 kV

2.21 kV

> 0.2 T $\Omega$ 

12

2.5 mm<sup>2</sup>

Test passed

-40 °C/2 h

100 °C/168 h

0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle

4.8 kV

2.21 kV

IEC 61984:2008-10

Finger safety with IP20  
test finger



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