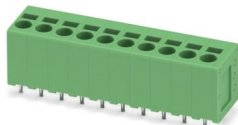


# SPT 2,5/10-V-5,0 - PCB terminal block

1991176

<https://www.phoenixcontact.com/us/products/1991176>

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PCB terminal block, nominal current: 24 A, rated voltage (III/2): 400 V, nominal cross section: 2.5 mm<sup>2</sup>, number of potentials: 10, number of rows: 1, number of positions per row: 10, product range: SPT 2,5/..-V, pitch: 5 mm, connection method: Push-in spring connection, mounting: Wave soldering, conductor/PCB connection direction: 90 °, color: green, Pin layout: Linear pinning, Solder pin [P]: 2.5 mm, number of solder pins per potential: 2, type of packaging: packed in cardboard

## Your advantages

- Time saving push-in connection, tools not required
- Defined contact force ensures that contact remains stable over the long term
- Clamping space opened by means of fixed screwdriver enables convenient conductor connection
- Operation and conductor connection from one direction enable integration into front of device
- Two solder pins reduce the mechanical strain on the soldering spots

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1991176       |
| Packing unit                         | 40 pc         |
| Minimum order quantity               | 50 pc         |
| Sales key                            | AA13          |
| Product key                          | AAMBFF        |
| GTIN                                 | 4046356104791 |
| Weight per piece (including packing) | 13.35 g       |
| Weight per piece (excluding packing) | 11.8 g        |
| Customs tariff number                | 85369010      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                           |                      |
|---------------------------|----------------------|
| Product type              | PCB terminal block   |
| Product family            | SPT 2,5/...-V        |
| Product line              | COMBICON Terminals M |
| Number of positions       | 10                   |
| Pitch                     | 5 mm                 |
| Number of connections     | 10                   |
| Number of rows            | 1                    |
| Number of potentials      | 10                   |
| Pin layout                | Linear pinning       |
| Solder pins per potential | 2                    |

### Electrical properties

#### Properties

|                             |       |
|-----------------------------|-------|
| Nominal current $I_N$       | 24 A  |
| Nominal voltage $U_N$       | 400 V |
| Rated voltage (III/3)       | 250 V |
| Rated surge voltage (III/3) | 4 kV  |
| Rated voltage (III/2)       | 400 V |
| Rated surge voltage (III/2) | 4 kV  |
| Rated voltage (II/2)        | 630 V |
| Rated surge voltage (II/2)  | 4 kV  |

### Connection data

#### Connection technology

|                       |                     |
|-----------------------|---------------------|
| Nominal cross section | 2.5 mm <sup>2</sup> |
|-----------------------|---------------------|

#### Conductor connection

|   |  |
|---|--|
| Connection method   | Push-in spring connection                    |
| Conductor cross-section rigid   | 0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>    |
| Conductor cross-section flexible  | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>  |
| Conductor cross-section AWG   | 24 ... 12                                    |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve    | 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |
| Stripping length  | 10 mm  |

#### Specifications for ferrules without insulating collar

|  |  |
|--|--|
| recommended crimping tool                                    | 1212034 CRIMPFOX 6                                 |
| ferrules without insulating collar, according to DIN 46228-1 | Cross section: 0.25 mm <sup>2</sup> ; Length: 7 mm |
|  | Cross section: 0.34 mm <sup>2</sup> ; Length: 7 mm |
|  | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm  |

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|  |  |
|--|--|
|  | Cross section: 0.75 mm <sup>2</sup> ; Length: 8 mm |
|  | Cross section: 1 mm <sup>2</sup> ; Length: 8 mm    |
|  | Cross section: 1.5 mm <sup>2</sup> ; Length: 8 mm  |
|  | Cross section: 2.5 mm <sup>2</sup> ; Length: 8 mm  |

## Specifications for ferrules with insulating collar

|   |  |
|---|--|
| recommended crimping tool                                 | 1212034 CRIMPFOX 6   |
| ferrules with insulating collar, according to DIN 46228-4 | Cross section: 0.25 mm <sup>2</sup> ; Length: 8 mm           |
|   | Cross section: 0.34 mm <sup>2</sup> ; Length: 8 mm           |
|   | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm ... 10 mm  |
|   | Cross section: 0.75 mm <sup>2</sup> ; Length: 8 mm ... 10 mm |
|   | Cross section: 1 mm <sup>2</sup> ; Length: 8 mm ... 10 mm    |
|   | Cross section: 1.5 mm <sup>2</sup> ; Length: 8 mm ... 10 mm  |
|   | Cross section: 2.5 mm <sup>2</sup> ; Length: 10 mm           |

## Mounting

|               |                |
|---------------|----------------|
| Mounting type | Wave soldering |
| Pin layout    | Linear pinning |

## Material specifications

### Material data - contact

|  |  |
|--|--|
| Note                                     | WEEE/RoHS-compliant, free of whiskers according to IEC 60068-2-82/JEDEC JESD 201 |
| Contact material                         | Cu alloy   |
| Surface characteristics                  | Tin-plated   |
| Metal surface terminal point (top layer) | Tin (4 µm - 8 µm Sn)   |
| Metal surface soldering area (top layer) | Tin (4 µm - 8 µm Sn)   |

### Material data - housing

|   |              |
|---|--------------|
| Color (Housing)   | green (6021) |
| Insulating material   | PA           |
| Insulating material group   | I            |
| CTI according to IEC 60112  | 600          |
| Flammability rating according to UL 94                            | V0           |
| 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       |

## Dimensions

|            |         |
|------------|---------|
| Pitch      | 5 mm    |
|            | 5 mm    |
| Width [w]  | 51.4 mm |
| Height [h] | 16.9 mm |
| Length [l] | 13.5 mm |

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|                       |         |
|-----------------------|---------|
| Installed height      | 14.4 mm |
| Solder pin length [P] | 2.5 mm  |
| PCB design            |         |
| Pin spacing           | 5 mm    |
| Hole diameter         | 1.2 mm  |

## Mechanical tests

### Test for conductor damage and slackening

|               |                     |
|---------------|---------------------|
| Specification | IEC 60999-1:1999-11 |
| Result        | Test passed         |

### Pull-out test

|   |   |
|---|---|
| Specification   | IEC 60999-1:1999-11                     |
| Conductor cross-section/conductor type/tractive force setpoint/actual value | 0.2 mm <sup>2</sup> / solid / > 10 N    |
|   | 0.2 mm <sup>2</sup> / flexible / > 10 N |
|   | 4 mm <sup>2</sup> / solid / > 60 N      |
|   | 2.5 mm <sup>2</sup> / flexible / > 50 N |

## Electrical tests

### Temperature-rise test

|                                   |  |
|-----------------------------------|--|
| Specification                     | IEC 60947-7-4:2019-01  |
| Requirement temperature-rise test | The sum of ambient temperature and temperature rise of the PCB terminal block shall not exceed the upper limiting temperature. |

### Short-time withstand current

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60947-7-4:2019-01 |
|---------------|-----------------------|

### Insulation resistance

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

### Air clearances and creepage distances | 1. Insulation coordination

|  |                       |
|--|-----------------------|
| Application  | without pitch spacer  |
| Specification  | IEC 60947-7-4:2019-01 |
| Insulating material group                              | I                     |
| Comparative tracking index (IEC 60112)                 | CTI 600               |
| Rated insulation voltage (III/3)                       | 250 V                 |
| Rated surge voltage (III/3)                            | 4 kV                  |
| minimum clearance value - non-homogenous field (III/3) | 3 mm                  |
| minimum creepage distance (III/3)                      | 3.2 mm                |
| Rated insulation voltage (III/2)                       | 400 V                 |
| Rated surge voltage (III/2)                            | 4 kV                  |
| minimum clearance value - non-homogenous field (III/2) | 3 mm                  |
| minimum creepage distance (III/2)                      | 3 mm                  |

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|   |        |
|---|--------|
| Rated insulation voltage (II/2)                       | 630 V  |
| Rated surge voltage (II/2)                            | 4 kV   |
| minimum clearance value - non-homogenous field (II/2) | 3 mm   |
| minimum creepage distance (II/2)                      | 3.2 mm |

## Air clearances and creepage distances | 2. Insulation coordination

|  |                       |
|--|-----------------------|
| Application  | with RZ-SPT 2,5-2,5   |
| Specification  | IEC 60947-7-4:2019-01 |
| Insulating material group                              | I                     |
| Comparative tracking index (IEC 60112)                 | CTI 600               |
| Rated insulation voltage (III/3)                       | 400 V                 |
| Rated surge voltage (III/3)                            | 6 kV                  |
| minimum clearance value - non-homogenous field (III/3) | 5.5 mm                |
| minimum creepage distance (III/3)                      | 5.5 mm                |
| Rated insulation voltage (III/2)                       | 630 V                 |
| Rated surge voltage (III/2)                            | 6 kV                  |
| minimum clearance value - non-homogenous field (III/2) | 5.5 mm                |
| minimum creepage distance (III/2)                      | 5.5 mm                |
| Rated insulation voltage (II/2)                        | 1000 V                |
| Rated surge voltage (II/2)                             | 6 kV                  |
| minimum clearance value - non-homogenous field (II/2)  | 5.5 mm                |
| minimum creepage distance (II/2)                       | 5.5 mm                |

## Air clearances and creepage distances | 3. Insulation coordination

|  |                       |
|--|-----------------------|
| Application  | with RZ-SPT 2,5-5,0   |
| Specification  | IEC 60947-7-4:2019-01 |
| Insulating material group                              | I                     |
| Comparative tracking index (IEC 60112)                 | CTI 600               |
| Rated insulation voltage (III/3)                       | 630 V                 |
| Rated surge voltage (III/3)                            | 8 kV                  |
| minimum clearance value - non-homogenous field (III/3) | 8 mm                  |
| minimum creepage distance (III/3)                      | 8 mm                  |
| Rated insulation voltage (III/2)                       | 800 V                 |
| Rated surge voltage (III/2)                            | 8 kV                  |
| minimum clearance value - non-homogenous field (III/2) | 8 mm                  |
| minimum creepage distance (III/2)                      | 8 mm                  |
| Rated insulation voltage (II/2)                        | 1000 V                |
| Rated surge voltage (II/2)                             | 8 kV                  |
| minimum clearance value - non-homogenous field (II/2)  | 8 mm                  |
| minimum creepage distance (II/2)                       | 8 mm                  |

## Environmental and real-life conditions

### Vibration test

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60068-2-6:2007-12 |
|---------------|-----------------------|

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|                        |  |
|------------------------|--|
| Frequency              | 10 - 150 - 10 Hz                         |
| Sweep speed            | 1 octave/min                             |
| Amplitude              | 0.35 mm (10 Hz ... 60.1 Hz)              |
| Acceleration           | 50 m/s <sup>2</sup> (60.1 Hz ... 150 Hz) |
| Test duration per axis | 2.5 h                                    |
| Test directions        | X-, Y- and Z-axis                        |

## Glow-wire test

|                  |                        |
|------------------|------------------------|
| Specification    | IEC 60695-2-10:2013-04 |
| Temperature      | 850 °C                 |
| Time of exposure | 5 s                    |

## Aging

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60947-7-4:2019-01 |
|---------------|-----------------------|

## Ambient conditions

|   |   |
|---|---|
| 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 (Depending on the current carrying capacity/derating curve) |

## Packaging specifications

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

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## Drawings

Diagram



Type: SPT 2,5/...-V-5,0

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1991176>

|  <b>cULus Recognized</b><br>Approval ID: E60425-20061129 |                       |                       |                   |                             |
|---|-----------------------|-----------------------|-------------------|-----------------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B   | 300 V                 | 20 A                  | 24 - 12           | -                           |
| C   | 150 V                 | 20 A                  | 24 - 12           | -                           |
| D   | 150 V                 | 15 A                  | 24 - 12           | -                           |

|  <b>VDE Zeichengenehmigung</b><br>Approval ID: 40042909 |                       |                       |                   |                             |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine  | 400 V                 | 32 A                  | -                 | 0.2 - 4                     |

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27460101 |
| ECLASS-15.0 | 27460101 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC002643 |
|-----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121400 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|   |                    |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes, No exemptions |
|---|--------------------|

### China RoHS

|  |  |
|--|--|
| Environment friendly use period (EFUP) | EFUP-E                                   |
|  | No hazardous substances above the limits |

### EU REACH SVHC

|                                     |                            |
|-------------------------------------|----------------------------|
| REACH candidate substance (CAS No.) | No substance above 0.1 wt% |
|-------------------------------------|----------------------------|

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 0.053 kg CO2e |
|---------|---------------|

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Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)