

# FRONT 2,5-H/SA 5-EX - PCB terminal block



1701159

<https://www.phoenixcontact.com/us/products/1701159>

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Printed circuit board terminal, nominal current: 21 A, nominal cross section: 2.5 mm<sup>2</sup>, number of potentials: 1, number of rows: 1, number of positions per row: 1, product range: FRONT 2,5-H-EX, pitch: 5 mm, connection method: Front screw connection, screw head form: L Slotted, mounting: Wave soldering, conductor/PCB connection direction: 0 °, color: green, Pin layout: Linear pinning, Solder pin [P]: 3.5 mm, number of solder pins per potential: 2, type of packaging: packed in cardboard. The article can be aligned to create different nos. of positions!

## Your advantages

- Well-known connection principle allows worldwide use
- Low temperature rise, thanks to maximum contact force
- Satisfies the more stringent safety requirements of "Ex e" protection according to IEC 60079-7 for potentially explosive areas
- Operation and conductor connection from one direction enable integration into front of device
- Two solder pins reduce the mechanical strain on the soldering spots
- The latching on the side enables various numbers of positions to be combined
- Allows connection of two conductors

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1701159       |
| Packing unit                         | 50 pc         |
| Minimum order quantity               | 50 pc         |
| Sales key                            | AA13          |
| Product key                          | AAMFDA        |
| GTIN                                 | 4017918022990 |
| Weight per piece (including packing) | 3.56 g        |
| Weight per piece (excluding packing) | 3.32 g        |
| Customs tariff number                | 85369010      |
| Country of origin                    | PL            |

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## Technical data

### Product properties

|                           |                                  |
|---------------------------|----------------------------------|
| Product type              | Printed circuit board terminal   |
| Product family            | FRONT 2,5-H-EX                   |
| Product line              | COMBICON Terminals M             |
| Type                      | PC terminal block can be aligned |
| Number of positions       | 1                                |
| Pitch                     | 5 mm                             |
| Number of connections     | 1                                |
| Number of rows            | 1                                |
| Number of potentials      | 1                                |
| Pin layout                | Linear pinning                   |
| Solder pins per potential | 2                                |

### Electrical properties

#### Properties

|   |                          |
|---|--------------------------|
| Nominal current $I_N$                   | 21 A                     |
| Nominal voltage $U_N$                   | 176 V                    |
| Rated current / conductor cross-section | 21 A/2.5 mm <sup>2</sup> |

### Ex data

#### Ex approval

|                                 |   |
|---------------------------------|---|
| Identification                  | 0344 <sup>Ⓢ</sup> II 2GD / Ex eb IIC Gb |
| EU-type examination certificate | KEMA 00ATEX2053 U                       |
| IECEx certificate               | IECEx KEM 07.0023 U                     |

### Connection data

#### Connection technology

|                       |                                  |
|-----------------------|----------------------------------|
| Type                  | PC terminal block can be aligned |
| Nominal cross section | 2.5 mm <sup>2</sup>              |

#### Conductor connection

|  |  |
|--|--|
| Connection method                              | Front screw connection                       |
| Conductor cross-section rigid                  | 0.2 mm <sup>2</sup> ... 2.5 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 ... 14                                    |
| 2 conductors with same cross section, rigid    | 0.2 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> |
| 2 conductors with same cross section, flexible | 0.2 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> |
| Stripping length                               | 9 mm   |
| Drive form screw head                          | Slotted (L)                                  |
| Tightening torque                              | 0.4 Nm ... 0.5 Nm                            |

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## Mounting

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

## Material specifications

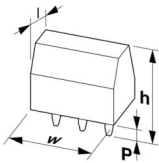
### Material data - contact

|  |  |
|--|--|
| Note                                     | WEEE/RoHS-compliant, free of whiskers according to IEC 60068-2-82/JEDEC JESD 201 |
| Contact material                         | Cu alloy   |
| Surface characteristics                  | hot-dip tin-plated   |
| Metal surface terminal point (top layer) | Tin (4 $\mu\text{m}$ - 8 $\mu\text{m}$ Sn)                                       |
| Metal surface soldering area (top layer) | Tin (4 $\mu\text{m}$ - 8 $\mu\text{m}$ 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

|                       |  |
|-----------------------|--|
| Dimensional drawing   |  |
| Pitch                 | 5 mm   |
| Width [w]             | 6.8 mm   |
| Height [h]            | 21.8 mm  |
| Length [l]            | 19.5 mm  |
| Installed height      | 18.3 mm  |
| Solder pin length [P] | 3.5 mm   |
| Pin dimensions        | 0.8 x 0.8 mm   |

### PCB design

|               |        |
|---------------|--------|
| Pin spacing   | 5 mm   |
| Hole diameter | 1.2 mm |

## Mechanical tests

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## 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 |
|   | 2.5 mm <sup>2</sup> / flexible / > 50 N |
|   | 2.5 mm <sup>2</sup> / solid / > 50 N    |

## Electrical tests

### Temperature-rise test

|                                   |  |
|-----------------------------------|--|
| Specification                     | IEC 60947-7-4:2013-08  |
| 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 60947-7-4:2013-08 |
|---------------|-----------------------|

### Insulation resistance

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

### Air clearances and creepage distances |

|                           |   |
|---------------------------|---|
| Insulating material group | I |
|---------------------------|---|

## Environmental and real-life conditions

### Vibration test

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

### Glow-wire test

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

### Aging

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60947-7-4:2013-08 |
|---------------|-----------------------|

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## 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)         | -50 °C ... 110 °C |

## Packaging specifications

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

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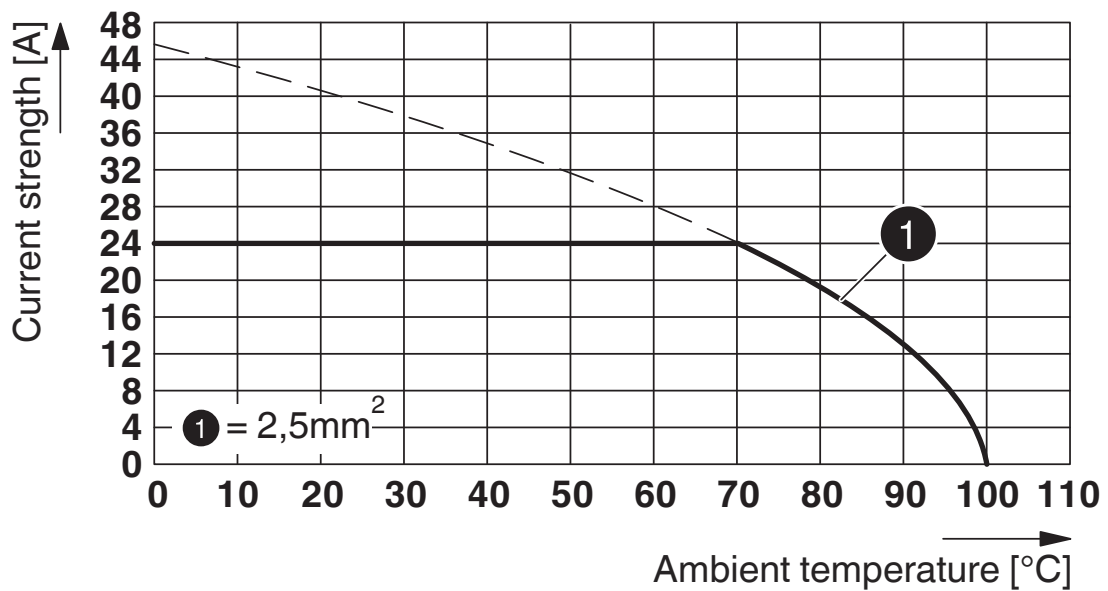
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## Drawings

Dimensional drawing



Diagram



Type: FRONT 2,5-H/SA 5/...

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Drilling plan/solder pad geometry



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1701159>

|  <b>cULus Recognized</b><br>Approval ID: E192998-20200414 |                       |                       |                   |                      |
|--|-----------------------|-----------------------|-------------------|----------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
| keine  |                       |                       |                   |                      |
| with pitch spacer  | 275 V                 | 20 A                  | 30 - 12           | -                    |
| Standard   | 176 V                 | 10 A                  | 30 - 12           | -                    |

|  <b>ATEX</b><br>Approval ID: KEMA 00ATEX2053 U |                       |                       |                   |                      |
|---|-----------------------|-----------------------|-------------------|----------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
| keine   |                       |                       |                   |                      |
|   | 176 V                 | 21 A                  | -                 | - 2.5                |
| with pitch spacer   | 275 V                 | 21 A                  | -                 | - 2.5                |
| with 2 pitch spacers  | 440 V                 | 21 A                  | -                 | - 2.5                |

|  <b>IECEX</b><br>Approval ID: IECEX KEM 07.0023U |                       |                       |                   |                      |
|---|-----------------------|-----------------------|-------------------|----------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
| keine   |                       |                       |                   |                      |
|   | 176 V                 | 21 A                  | -                 | - 2.5                |
| with pitch spacer   | 275 V                 | 21 A                  | -                 | - 2.5                |
| with 2 pitch spacers  | 440 V                 | 21 A                  | -                 | - 2.5                |

|  <b>CCC</b><br>Approval ID: 2021322313003649 |  |  |  |  |
|---|--|--|--|--|
|---|--|--|--|--|

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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 | 0.034 kg CO2e |
|---------|---------------|

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