

# FMC 1,5/20-ST-3,5-RFBKAUCN4,17 - PCB connector



1811569

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PCB connector, nominal cross section: 1.5 mm<sup>2</sup>, color: black, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Au, contact connection type: Socket, number of potentials: 20, number of rows: 1, number of positions: 20, number of connections: 20, product range: FMC 1,5/...-ST-RF, pitch: 3.5 mm, connection method: Push-in spring connection, conductor/PCB connection direction: 0 °, plug-in system: COMBICON FMC 1,5 - MCDN 1,5, locking: Snap-in locking, mounting method: Latching flange, type of packaging: packed in cardboard



## Your advantages

- Gold-plated contacts ensure transfer quality remains stable over the long term
- Time saving push-in connection, tools not required
- Defined contact force ensures that contact remains stable over the long term
- Intuitive operation due to color-coded actuating push button
- Operation and conductor connection from one direction enable integration into front of device
- Intuitive locking mechanism prevents accidental disconnection

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1811569       |
| Packing unit                         | 50 pc         |
| Minimum order quantity               | 50 pc         |
| Sales key                            | AA02          |
| Product key                          | AABFAC        |
| GTIN                                 | 4046356723732 |
| Weight per piece (including packing) | 12.538 g      |
| Weight per piece (excluding packing) | 11.51 g       |
| Customs tariff number                | 85366990      |
| Country of origin                    | DE            |

## Technical data

### Product properties

|                       |                       |
|-----------------------|-----------------------|
| Product type          | PCB connector         |
| Product family        | FMC 1,5/..-ST-RF      |
| Product line          | COMBICON Connectors S |
| Number of positions   | 20                    |
| Pitch                 | 3.5 mm                |
| Number of connections | 20                    |
| Number of rows        | 1                     |
| Number of potentials  | 20                    |
| Mounting type         | without               |

### Electrical properties

#### Properties

|                             |        |
|-----------------------------|--------|
| Nominal current $I_N$       | 8 A    |
| Nominal voltage $U_N$       | 160 V  |
| Contact resistance          | 1.8 mΩ |
| Rated voltage (III/3)       | 160 V  |
| Rated surge voltage (III/3) | 2.5 kV |
| Rated voltage (III/2)       | 160 V  |
| Rated surge voltage (III/2) | 2.5 kV |
| Rated voltage (II/2)        | 320 V  |
| Rated surge voltage (II/2)  | 2.5 kV |

### Connection data

#### Connection technology

|                         |                             |
|-------------------------|-----------------------------|
| Connector system        | COMBICON FMC 1,5 - MCDN 1,5 |
|                         | COMBICON FMC 1,5 - MCDN 1,5 |
| Nominal cross section   | 1.5 mm <sup>2</sup>         |
| Contact connection type | Socket                      |

#### Interlock

|               |                 |
|---------------|-----------------|
| Locking type  | Snap-in locking |
| Mounting type | Latching flange |

#### Conductor connection

|   |  |
|---|--|
| Connection method   | Push-in spring connection                    |
| Conductor/PCB connection direction                                      | 0 °  |
| Conductor cross-section rigid   | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>  |
| Conductor cross-section flexible  | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>  |
| Conductor cross-section AWG   | 24 ... 16                                    |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |

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|  |   |
|--|---|
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> |
| Cylindrical gauge a x b / diameter                                   | 2.4 mm x 1.5 mm / 1.6 mm                      |
| 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 ... 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: 10 mm           |

## Specifications for ferrules with insulating collar

|   |  |
|---|--|
| recommended crimping tool                                 | 1212034 CRIMPFOX 6   |
| ferrules with insulating collar, according to DIN 46228-4 | Cross section: 0.14 mm <sup>2</sup> ; Length: 8 mm           |
|   | Cross section: 0.25 mm <sup>2</sup> ; Length: 8 mm ... 10 mm |
|   | Cross section: 0.34 mm <sup>2</sup> ; Length: 8 mm ... 10 mm |
|   | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm ... 10 mm  |
|   | Cross section: 0.75 mm <sup>2</sup> ; Length: 10 mm          |

## 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                     | partially gold-plated  |
| Metal surface terminal point (top layer)    | Tin (3 µm - 8 µm Sn)   |
| Metal surface terminal point (middle layer) | Nickel (2 µm - 4 µm Ni)  |
| Metal surface contact area (top layer)      | Gold (0.8 µm - 1 µm Au)  |
| Metal surface contact area (middle layer)   | Nickel (2 µm - 4 µm Ni)  |

### Material data - housing

|   |              |
|---|--------------|
| Color (Housing)   | black (9005) |
| 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       |

### Material data – actuating element

|                           |               |
|---------------------------|---------------|
| Color (Actuating element) | orange (2003) |
|---------------------------|---------------|

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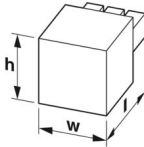


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|  |      |
|--|------|
| Insulating material                    | PBT  |
| Insulating material group              | IIIa |
| CTI according to IEC 60112             | 275  |
| Flammability rating according to UL 94 | V0   |

## Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Pitch               | 3.5 mm   |
| Width [w]           | 79.5 mm  |
| Height [h]          | 7.75 mm  |
| Length [l]          | 22.9 mm  |

## Notes

|                    |  |
|--------------------|--|
| 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. |
|--------------------|--|

## Mechanical tests

### Conductor connection

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

### Test for conductor damage and slackening

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

### Repeated connection and disconnection

|               |                     |
|---------------|---------------------|
| 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 |
|   | 1.5 mm <sup>2</sup> / solid / > 40 N    |
|   | 1.5 mm <sup>2</sup> / flexible / > 40 N |

### Insertion and withdrawal forces

|               |                        |
|---------------|------------------------|
| Specification | IEC 60512-13-2:2006-02 |
| Result        | Test passed            |
| No. of cycles | 100                    |

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|                                     |     |
|-------------------------------------|-----|
| Insertion strength per pos. approx. | 3 N |
| Withdraw strength per pos. approx.  | 3 N |

## Resistance of inscriptions

|               |                        |
|---------------|------------------------|
| Specification | IEC 60068-2-70:1995-12 |
| Result        | Test passed            |

## Polarization and coding

|               |                        |
|---------------|------------------------|
| Specification | IEC 60512-13-5:2006-02 |
| Result        | Test passed            |

## Visual inspection

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60512-1-1:2002-02 |
| Result        | Test passed           |

## Dimension check

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60512-1-2:2002-02 |
| Result        | Test passed           |

## Environmental and real-life conditions

### Durability test

|  |                       |
|--|-----------------------|
| Specification                                | IEC 60512-9-1:2010-03 |
| Impulse withstand voltage at sea level       | 2.95 kV               |
| Contact resistance $R_1$                     | 1.8 m $\Omega$        |
| Contact resistance $R_2$                     | 1.9 m $\Omega$        |
| Insertion/withdrawal cycles                  | 100                   |
| Insulation resistance, neighboring positions | > 5 M $\Omega$        |

### Climatic test

|                                   |  |
|-----------------------------------|--|
| Specification                     | DIN 50018:2013-05  |
| Corrosive stress                  | 1.0 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /40 °C/3 cycles |
| Thermal stress                    | 100 °C/168 h   |
| Power-frequency withstand voltage | 1.39 kV  |

### Vibration test

|                        |                             |
|------------------------|-----------------------------|
| Specification          | IEC 60068-2-6:2007-12       |
| Frequency              | 10 - 500 - 10 Hz            |
| Sweep speed            | 1 octave/min                |
| Amplitude              | 0.35 mm (10 Hz ... 60.1 Hz) |
| Acceleration           | 5g (60.1 Hz ... 500 Hz)     |
| Test duration per axis | 2 h                         |
| Test directions        | X-, Y- and Z-axis           |

### 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 ... 100 °C (dependent on the derating curve) |
|---------------------------------|---|

## Electrical tests

### Thermal test | Test group C

|                            |                       |
|----------------------------|-----------------------|
| Specification              | IEC 60512-5-1:2002-02 |
| Tested number of positions | 12                    |

### Insulation resistance

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

### Air clearances and creepage distances |

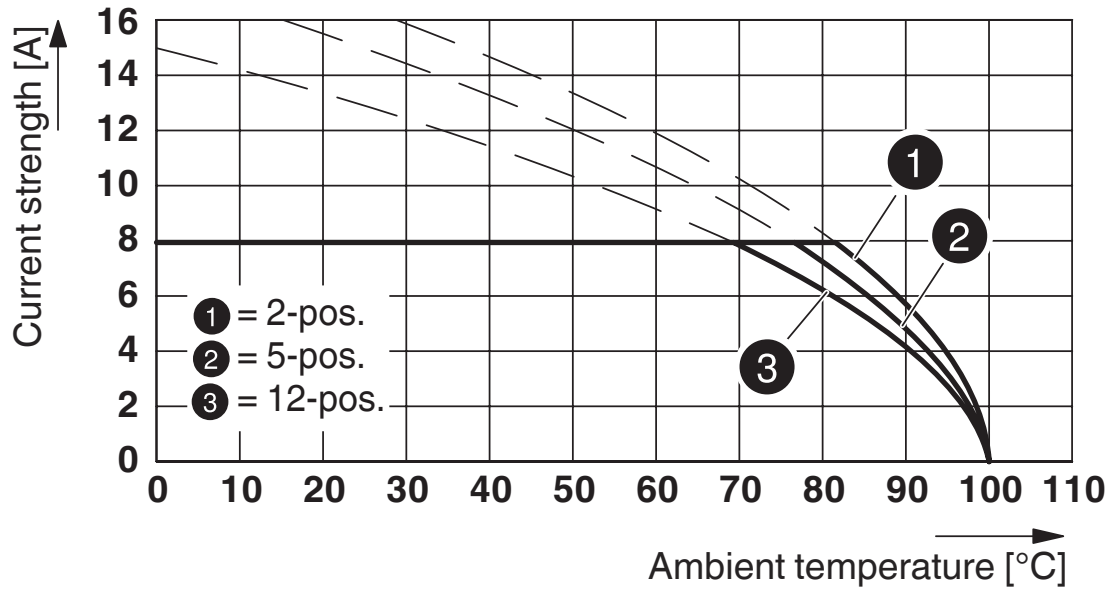
|  |                     |
|--|---------------------|
| Specification  | IEC 60664-1:2007-04 |
| Insulating material group                              | I                   |
| Comparative tracking index (IEC 60112)                 | CTI 600             |
| Rated insulation voltage (III/3)                       | 160 V               |
| Rated surge voltage (III/3)                            | 2.5 kV              |
| minimum clearance value - non-homogenous field (III/3) | 1.5 mm              |
| minimum creepage distance (III/3)                      | 2 mm                |
| Rated insulation voltage (III/2)                       | 160 V               |
| Rated surge voltage (III/2)                            | 2.5 kV              |
| minimum clearance value - non-homogenous field (III/2) | 1.5 mm              |
| minimum creepage distance (III/2)                      | 1.5 mm              |
| Rated insulation voltage (II/2)                        | 320 V               |
| Rated surge voltage (II/2)                             | 2.5 kV              |
| minimum clearance value - non-homogenous field (II/2)  | 1.5 mm              |
| minimum creepage distance (II/2)                       | 1.6 mm              |

## Packaging specifications

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

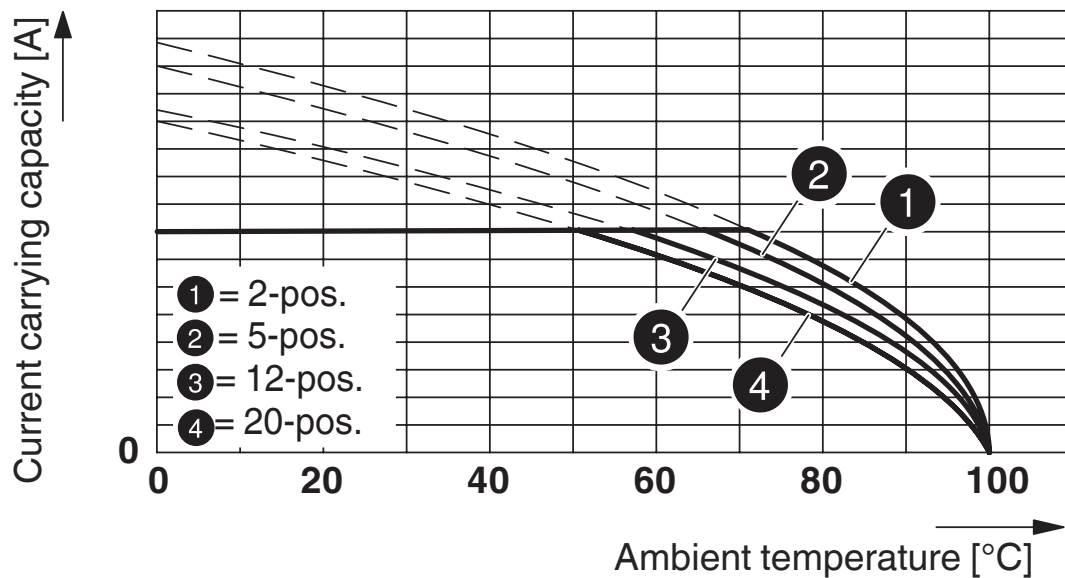
Drawings

Diagram



Type: FMC 1,5/...-ST-3,5-RF AU with MC 1,5/...-G-3,5-RN AU

Diagram




Type: FMC 1,5/...-ST-3,5-RF AU with MCDN 1,5/...-G1-3,5 RNP26THR AU


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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1811569>

|  <b>cULus Recognized</b><br>Approval ID: E60425-19920306 |                       |                       |                   |                      |
|---|-----------------------|-----------------------|-------------------|----------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
| <b>B</b>  |                       |                       |                   |                      |
| Field wiring  | 150 V                 | 8 A                   | 24 - 16           | -                    |
| <b>C</b>  |                       |                       |                   |                      |
| Factory wiring  | 50 V                  | 8 A                   | 24 - 16           | -                    |

|  <b>VDE approval of drawings</b><br>Approval ID: 40011723 |  |
|--|--|
|  |  |

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27460202 |
| ECLASS-15.0 | 27460202 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC002638 |
|-----------|----------|

### 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% |
|-------------------------------------|----------------------------|

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