

# FMCOW 1,5/ 4-ST-3,5-LR - PCB connector



1446085

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PCB connector, nominal cross section: 1.5 mm<sup>2</sup>, color: green, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Sn, contact connection type: Socket, number of rows: 1, number of positions: 4, product range: FMCOW 1,5/...-ST-LR, pitch: 3.5 mm, connection method: Push-in spring connection, conductor/PCB connection direction: -90 °, plug-in system: COMBICON MC 1,5, locking: Lock-and-release locking system, mounting method: Lock & Release ejector lever, type of packaging: packed in cardboard

## Your advantages

- The conductor connection orthogonal to the direction of operation simplifies the cabling of DIN-rail-mountable devices
- Time saving push-in connection, tools not required
- Intuitive operation due to color-coded actuating push button

## Commercial data

|                                      |                                |
|--------------------------------------|--------------------------------|
| Item number                          | 1446085                        |
| Packing unit                         | 50 pc                          |
| Minimum order quantity               | 50 pc                          |
| Note                                 | Made to order (non-returnable) |
| Sales key                            | AA02                           |
| Product key                          | AABFEC                         |
| GTIN                                 | 4063151829872                  |
| Weight per piece (including packing) | 3.642 g                        |
| Weight per piece (excluding packing) | 3.642 g                        |
| Customs tariff number                | 85366990                       |
| Country of origin                    | PL                             |

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## Technical data

### Product properties

|                     |                       |
|---------------------|-----------------------|
| Product type        | PCB connector         |
| Product family      | FMCOW 1,5/...-ST-LR   |
| Product line        | COMBICON Connectors S |
| Number of positions | 4                     |
| Pitch               | 3.5 mm                |
| Number of rows      | 1                     |

### Electrical properties

#### Properties

|                             |        |
|-----------------------------|--------|
| Nominal current $I_N$       | 8 A    |
| Nominal voltage $U_N$       | 160 V  |
| Contact resistance          | 2.3 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 MC 1,5 |
| Nominal cross section   | 1.5 mm²         |
| Contact connection type | Socket          |

#### Interlock

|               |                                 |
|---------------|---------------------------------|
| Locking type  | Lock-and-release locking system |
| Mounting type | Lock & Release ejector lever    |

#### Conductor connection

|                                                                                           |                           |
|-------------------------------------------------------------------------------------------|---------------------------|
| Connection method                                                                         | Push-in spring connection |
| Conductor/PCB connection direction                                                        | -90 °                     |
| Conductor cross-section rigid                                                             | 0.14 mm² ... 1.5 mm²      |
| Conductor cross-section flexible                                                          | 0.14 mm² ... 1.5 mm²      |
| Conductor cross-section AWG                                                               | 24 ... 16                 |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve                   | 0.25 mm² ... 1.5 mm²      |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve                      | 0.14 mm² ... 0.75 mm²     |
| 2 conductors with the same cross section, flexible, with TWIN ferrule with plastic sleeve | 0.5 mm² ... 0.75 mm²      |
| Cylindrical gauge a x b / diameter                                                        | 2.4 mm x 1.5 mm / 1.9 mm  |

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|                  |      |
|------------------|------|
| Stripping length | 8 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  |
|                                                              | Cross section: 0.75 mm <sup>2</sup> ; Length: 8 mm |
|                                                              | Cross section: 1 mm <sup>2</sup> ; Length: 7 mm    |
|                                                              | Cross section: 1.5 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: 0.14 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  |
|                                                           | Cross section: 0.75 mm <sup>2</sup> ; Length: 8 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                  | hot-dip tin-plated                                                               |
| Metal surface terminal point (top layer) | Tin (4 µm - 8 µm Sn)                                                             |
| Metal surface contact 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       |

### Material data – actuating element

|                                        |               |
|----------------------------------------|---------------|
| Color (Actuating element)              | orange (2003) |
| Insulating material                    | PBT           |
| Insulating material group              | I             |
| CTI according to IEC 60112             | 600           |
| Flammability rating according to UL 94 | V0            |

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## Dimensions

|                     |                                                                                    |
|---------------------|------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Pitch               | 3.5 mm                                                                             |
| Width [w]           | 21.29 mm                                                                           |
| Height [h]          | 27.4 mm                                                                            |
| Length [l]          | 12.73 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 | 0.14 mm <sup>2</sup> / solid / > 10 N    |
|                                                                             | 0.14 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                       | 25                     |
| Insertion strength per pos. approx. | 5 N                    |
| Withdraw strength per pos. approx.  | 4 N                    |

### Resistance of inscriptions

|               |                        |
|---------------|------------------------|
| Specification | IEC 60068-2-70:1995-12 |
|---------------|------------------------|

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|                         |                        |
|-------------------------|------------------------|
| 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 $R_1$                     | 2.3 mΩ                |
| Contact resistance $R_2$                     | 2.3 mΩ                |
| Insertion/withdrawal cycles                  | 25                    |
| Insulation resistance, neighboring positions | > 5 MΩ                |

|                                   |                                                                           |
|-----------------------------------|---------------------------------------------------------------------------|
| Climatic test                     |                                                                           |
| Specification                     | EN ISO 22479:2022-06                                                      |
| Corrosive stress                  | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /40 °C/1 cycle |
| Thermal stress                    | 105 °C/168 h                                                              |
| Power-frequency withstand voltage | 1.39 kV                                                                   |

|                        |                             |
|------------------------|-----------------------------|
| 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           |

|                                                  |                                                          |
|--------------------------------------------------|----------------------------------------------------------|
| Railway application: Oscillation/broadband noise |                                                          |
| Specification                                    | DIN EN 50155 (VDE 0115-200):2022-06<br>IEC 61373:2010-05 |
| Spectrum                                         | Long life test category 1, class B, body mounted         |
| Frequency                                        | $f_1 = 5 \text{ Hz}$ to $f_2 = 150 \text{ Hz}$           |
| ASD level                                        | 0.964 (m/s <sup>2</sup> ) <sup>2</sup> /Hz               |
| Acceleration                                     | 0.572 g                                                  |
| Test duration per axis                           | 5 h                                                      |

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|                      |                   |
|----------------------|-------------------|
| Test directions      | X-, Y- and Z-axis |
| Contact interruption | < 1 µs            |
| Result               | Test passed       |

## Railway application: Shocks

|                                |                                                          |
|--------------------------------|----------------------------------------------------------|
| Specification                  | DIN EN 50155 (VDE 0115-200):2022-06<br>IEC 61373:2010-05 |
| Pulse shape                    | Semi-sinusoidal                                          |
| Number of shocks per direction | 3                                                        |
| Contact interruption           | < 1 µs                                                   |
| Result                         | Test passed                                              |

## 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 (dependent on the derating curve) |

## Electrical tests

### Thermal test | Test group C

|                            |                       |
|----------------------------|-----------------------|
| Specification              | IEC 60512-5-1:2002-02 |
| Tested number of positions | 16                    |

### Insulation resistance

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

### Temperature cycles

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

### 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              |

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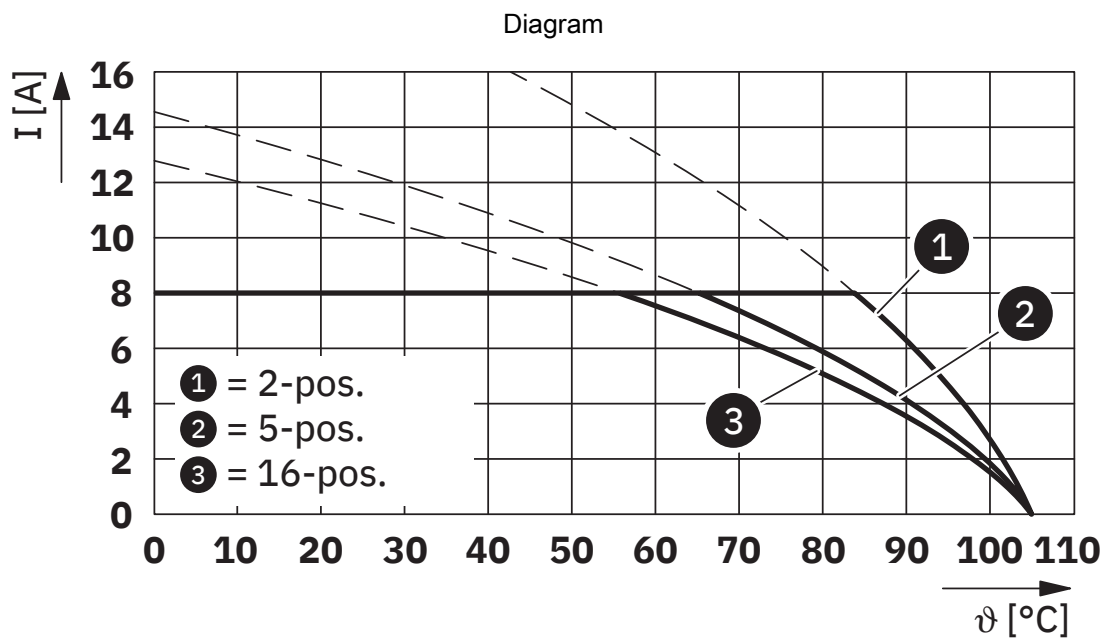
<https://www.phoenixcontact.com/us/products/1446085>

|                                  |        |
|----------------------------------|--------|
| minimum creepage distance (II/2) | 1.6 mm |
|----------------------------------|--------|

## Packaging specifications

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

## Drawings



Type: FMCOW 1,5/...-ST-3,5-LR with MCV 1,5/...-GF-3,5-LR

# FMCOW 1,5/ 4-ST-3,5-LR - PCB connector



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1446085>

|  <b>cULus Recognized</b><br>Approval ID: E60425-19920306 |                       |                       |                   |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                                           | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B                                                                                                                                         |                       |                       |                   |                             |
|                                                                                                                                           | 150 V                 | 8 A                   | 24 - 16           | -                           |

|  <b>VDE Zeichengenehmigung</b><br>Approval ID: 40011723 |                       |                       |                   |                             |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                                          | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine                                                                                                                                    |                       |                       |                   |                             |
|                                                                                                                                          | 160 V                 | 8 A                   | -                 | 0.2 - 1.5                   |

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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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