

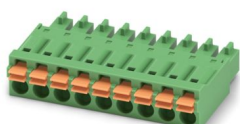
# FMC 1,5/ 9-ST-3,81 - PCB connector



1748040

<https://www.phoenixcontact.com/us/products/1748040>

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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 potentials: 9, number of rows: 1, number of positions: 9, number of connections: 9, product range: FMC 1,5/-ST, pitch: 3.81 mm, connection method: Push-in spring connection, conductor/PCB connection direction: 0 °, plug-in system: COMBICON FMC 1,5 - MCDN 1,5, locking: without, mounting method: without, 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
- Intuitive operation due to color-coded actuating push button
- Operation and conductor connection from one direction enable integration into front of device

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1748040       |
| Packing unit                         | 50 pc         |
| Minimum order quantity               | 50 pc         |
| Sales key                            | AA02          |
| Product key                          | AABFBA        |
| GTIN                                 | 4046356311083 |
| Weight per piece (including packing) | 5.454 g       |
| Weight per piece (excluding packing) | 5.2 g         |
| Customs tariff number                | 85366990      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                       |                       |
|-----------------------|-----------------------|
| Product type          | PCB connector         |
| Product family        | FMC 1,5/...-ST        |
| Product line          | COMBICON Connectors S |
| Type                  | Standard              |
| Number of positions   | 9                     |
| Pitch                 | 3.81 mm               |
| Number of connections | 9                     |
| Number of rows        | 1                     |
| Number of potentials  | 9                     |
| Mounting type         | without               |

### Electrical properties

#### Properties

|                             |        |
|-----------------------------|--------|
| Nominal current $I_N$       | 8 A    |
| Nominal voltage $U_N$       | 160 V  |
| Contact resistance          | 1.5 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

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

#### Interlock

|               |         |
|---------------|---------|
| Locking type  | without |
| Mounting type | without |

#### 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                                   |

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|                                                                       |                          |
|-----------------------------------------------------------------------|--------------------------|
| 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    |
| 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 mm²; Length: 7 mm           |
|                                                              | Cross section: 0.34 mm²; Length: 7 mm           |
|                                                              | Cross section: 0.5 mm²; Length: 8 mm ... 10 mm  |
|                                                              | Cross section: 0.75 mm²; Length: 8 mm ... 10 mm |
|                                                              | Cross section: 1 mm²; Length: 8 mm ... 10 mm    |
|                                                              | Cross section: 1.5 mm²; 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 mm²; Length: 8 mm           |
|                                                           | Cross section: 0.25 mm²; Length: 8 mm ... 10 mm |
|                                                           | Cross section: 0.34 mm²; Length: 8 mm ... 10 mm |
|                                                           | Cross section: 0.5 mm²; Length: 8 mm ... 10 mm  |
|                                                           | Cross section: 0.75 mm²; 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                  | hot-dip tin-plated                                                               |
| Metal surface terminal point (top layer) | Tin (4 - 8 µm Sn)                                                                |
| Metal surface contact area (top layer)   | Tin (4 - 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) |
|---------------------------|---------------|

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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               | 3.81 mm                                                                            |
| Width [w]           | 34.73 mm                                                                           |
| Height [h]          | 7.75 mm                                                                            |
| Length [l]          | 21.9 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 | 25                     |

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|                                     |     |
|-------------------------------------|-----|
| Insertion strength per pos. approx. | 8 N |
| Withdraw strength per pos. approx.  | 5 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

### 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           |

### Durability test

|                                              |                       |
|----------------------------------------------|-----------------------|
| Specification                                | IEC 60512-9-1:2010-03 |
| Impulse withstand voltage at sea level       | 2.95 kV               |
| Contact resistance R <sub>1</sub>            | 1.5 mΩ                |
| Contact resistance R <sub>2</sub>            | 1.7 mΩ                |
| Insertion/withdrawal cycles                  | 25                    |
| Insulation resistance, neighboring positions | > 5 MΩ                |

### Climatic test

|                                   |                                                                           |
|-----------------------------------|---------------------------------------------------------------------------|
| Specification                     | ISO 6988:1985-02                                                          |
| Corrosive stress                  | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /40 °C/1 cycle |
| Thermal stress                    | 100 °C/168 h                                                              |
| Power-frequency withstand voltage | 1.39 kV                                                                   |

### Ambient conditions

|                                         |                                                     |
|-----------------------------------------|-----------------------------------------------------|
| Ambient temperature (operation)         | -40 °C ... 100 °C (dependent on the derating curve) |
| Ambient temperature (storage/transport) | -40 °C ... 70 °C                                    |
| Relative humidity (storage/transport)   | 30 % ... 70 %                                       |

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|                                |                  |
|--------------------------------|------------------|
| Ambient temperature (assembly) | -5 °C ... 100 °C |
|--------------------------------|------------------|

## Electrical tests

### Thermal test | Test group C

|                            |                       |
|----------------------------|-----------------------|
| Specification              | IEC 60512-5-1:2002-02 |
| Tested number of positions | 20                    |

### 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 |
|-------------------|---------------------|

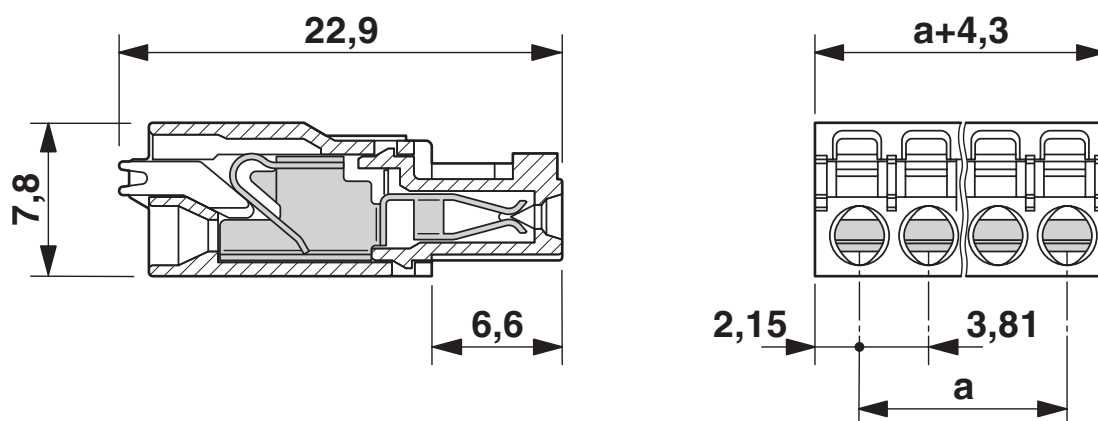
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## Drawings

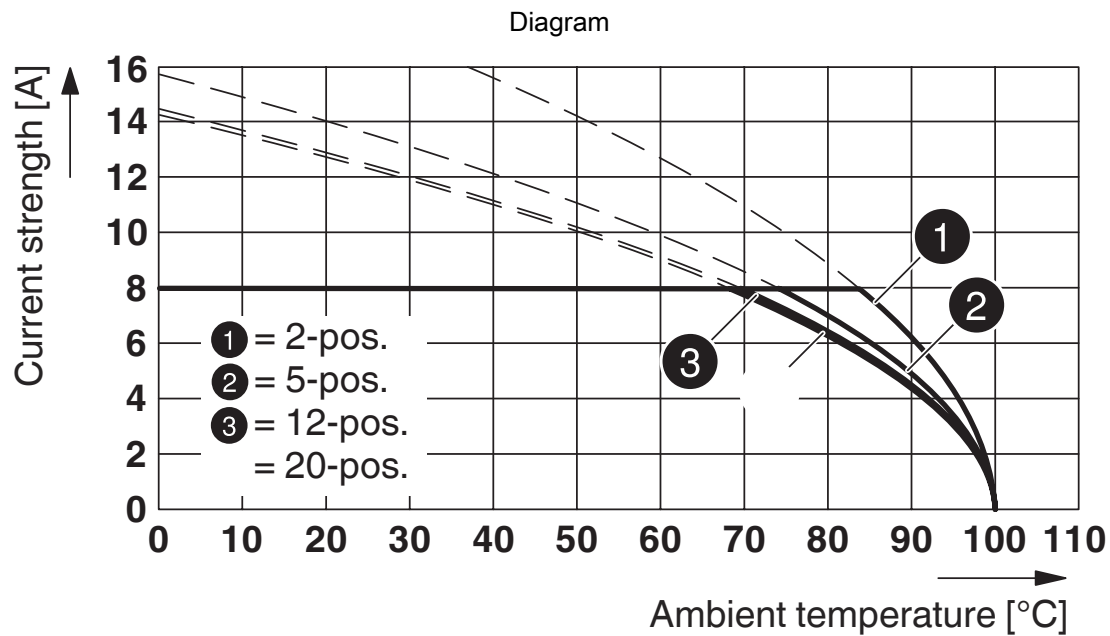
Dimensional drawing



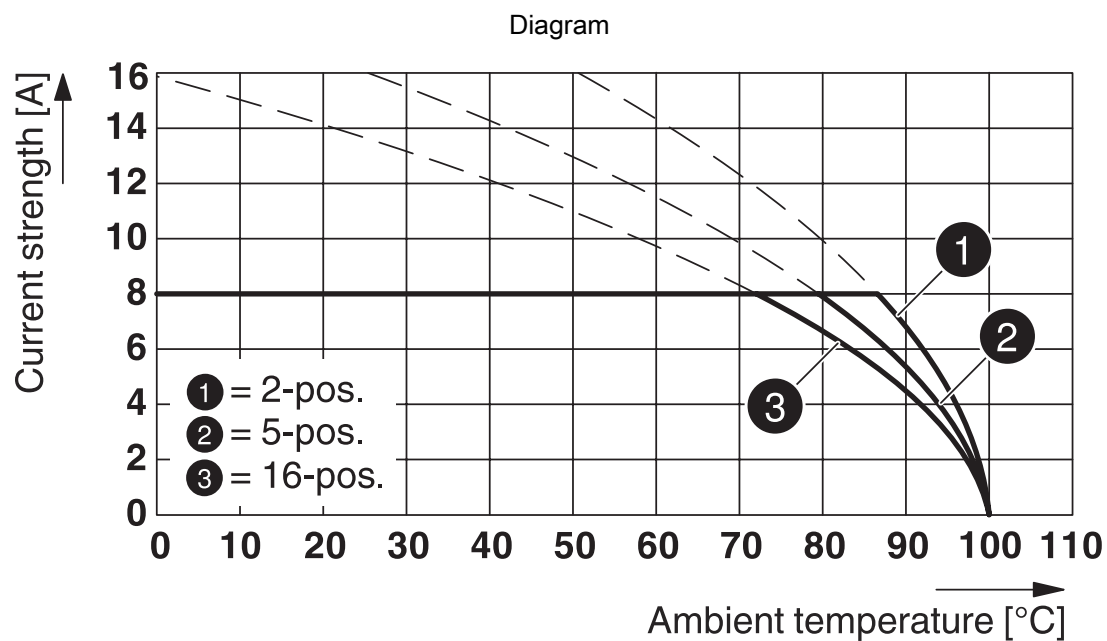
Diagram



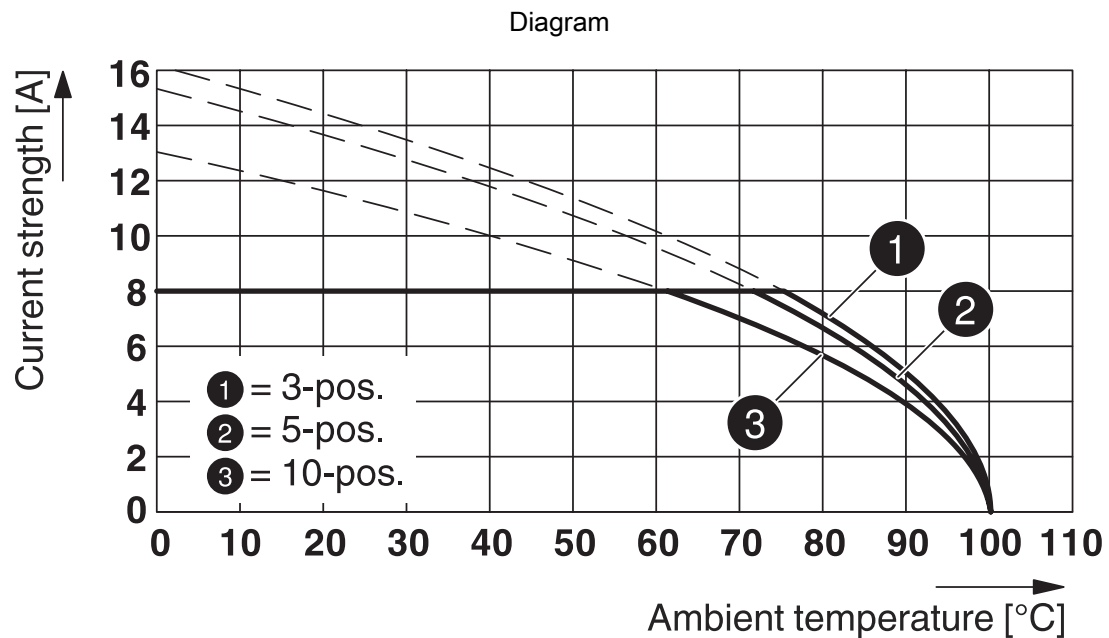
Type: FMC 1,5/...-ST-3,81 with MCV 1,5/...-G-3,81



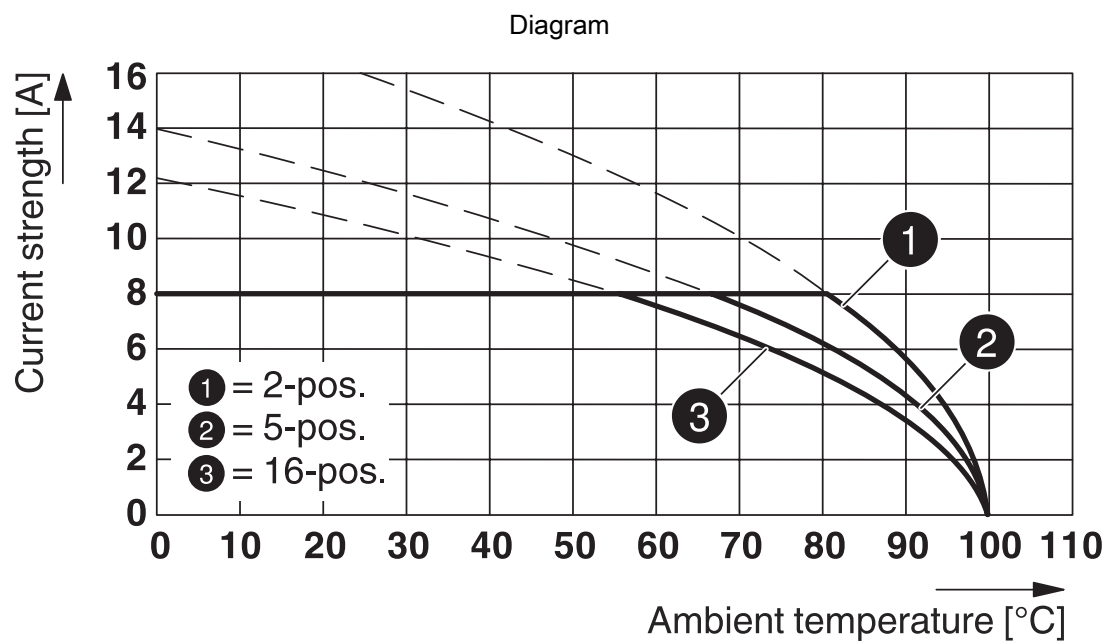
Type: FMC 1,5/...-ST-3,81 with MC 1,5/...-G-3,81



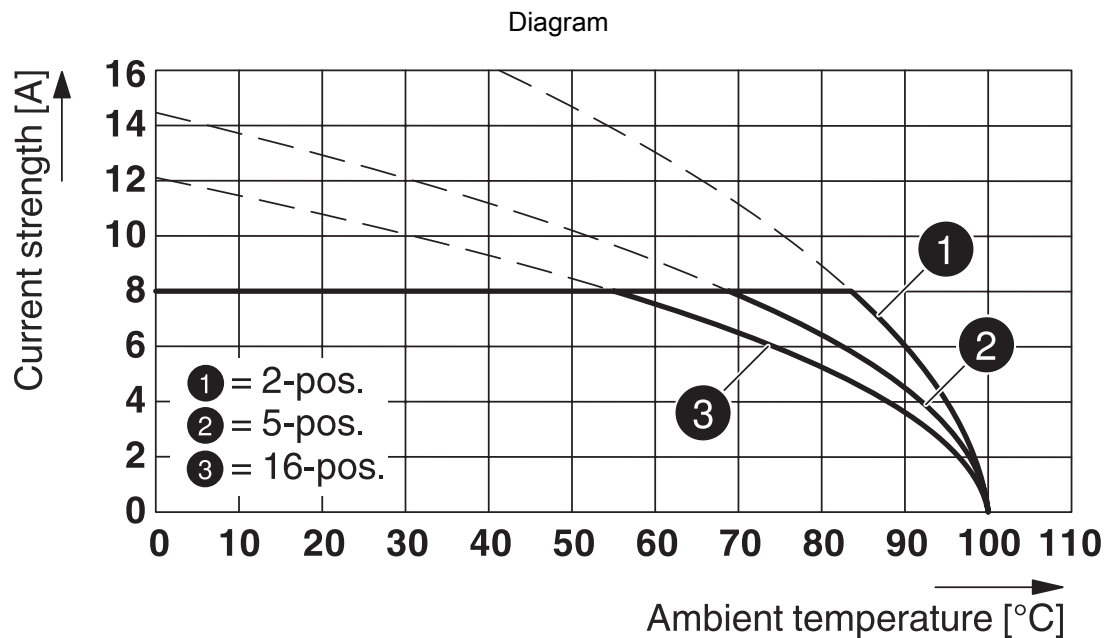
Type: FMC 1,5/...-ST-3,81 with SMC 1,5/...-G-3,81



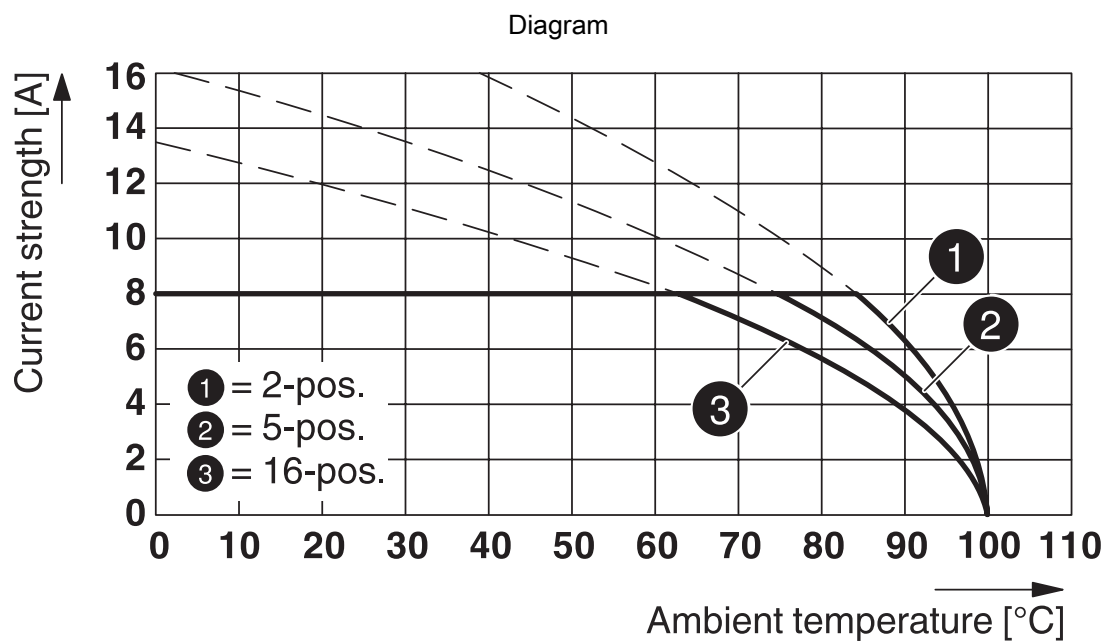
Type: FMC 1,5/...-ST-3,81 with MCO 1,5/...-GR-3,81



Type: FMC 1,5/...-ST-3,81 with MCD 1,5/...-G-3,81



Type: FMC 1,5/...-ST-3,81 with MCD 1,5/...-G1-3,81



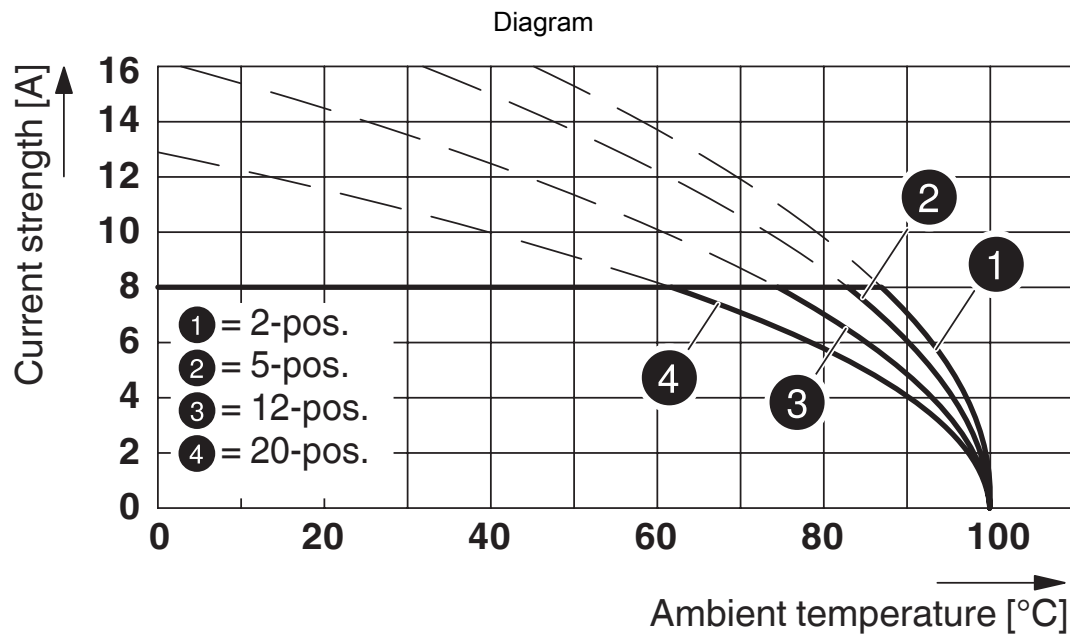
Type: FMC 1,5/...-ST-3,81 with MCDV 1,5/...-G-3,81



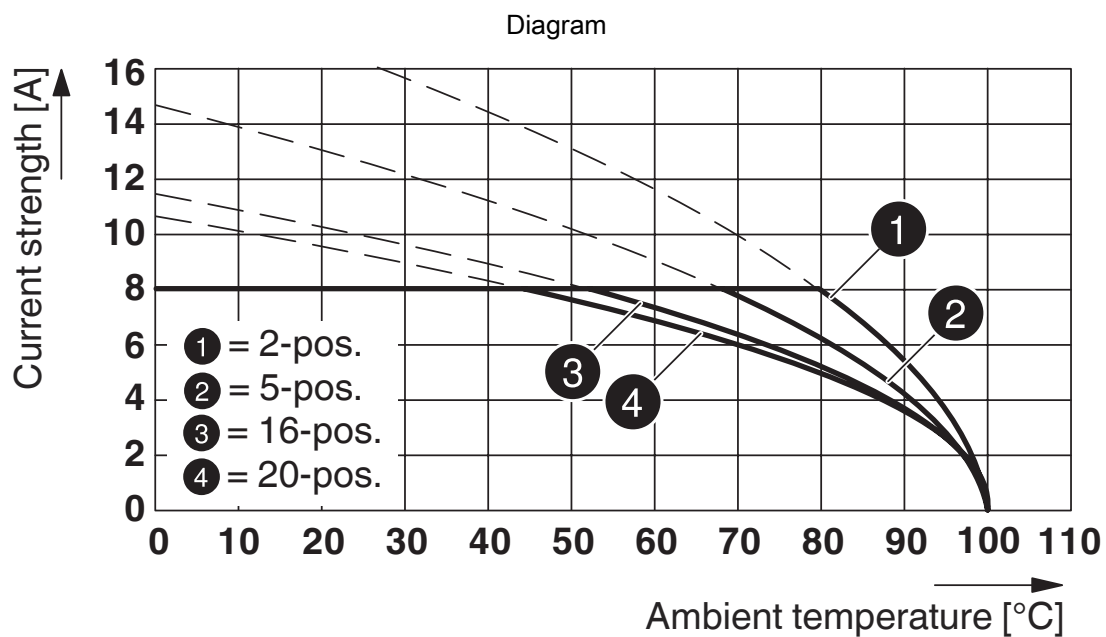
Type: FMC 1,5/...-ST-3,81 with MCDV 1,5/...-G1-3,81



Type: FMC 1,5/...-ST-3,81 with MCVU 1,5/...-GFD-3,81



Type: FMC 1,5/...-ST-3,81 with MCV 1,5/...-G-3,81 P.. THR

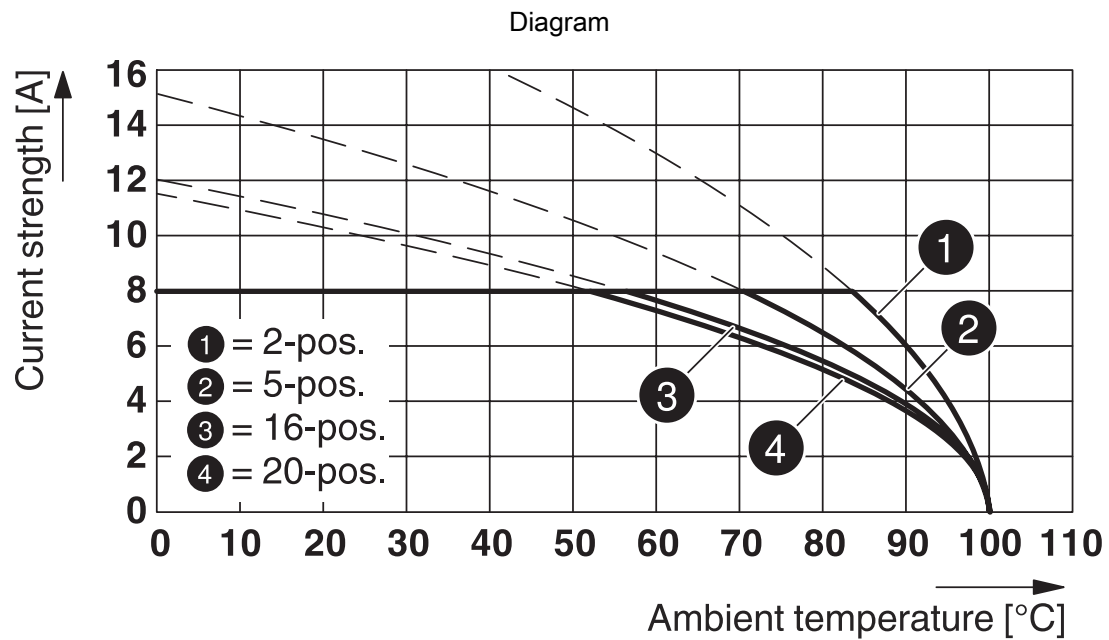


Type: FMC 1,5/...-ST-3,81 with MCDN 1,5/...-G1-3,81 P...THR

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Type: FMC 1,5/...-ST-3,81 with MCDNV 1,5/...-G1-3,81 P...THR

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1748040>

|                                                                                                                                                       |                       |                       |                   |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
| <div> <b>cULus Recognized</b><br/>Approval ID: E60425-19920306</div> |                       |                       |                   |                             |
|                                                                                                                                                       | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B                                                                                                                                                     |                       |                       |                   |                             |
| Field wiring                                                                                                                                          | 300 V                 | 8 A                   | 24 - 16           | -                           |
| C                                                                                                                                                     |                       |                       |                   |                             |
| Factory wiring                                                                                                                                        | 50 V                  | 8 A                   | 24 - 16           | -                           |

 **VDE approval of drawings**  
Approval ID: 40011723

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Approval ID: 40011723

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | 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%               |
| EF3.0 Climate Change                    |                                          |
| CO2e kg                                 | 0.103 kg CO2e                            |

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