

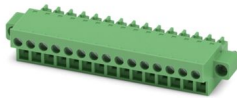
# FRONT-MC 1,5/15-STF-3,81 - PCB connector



1850987

<https://www.phoenixcontact.com/us/products/1850987>

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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: 15, number of rows: 1, number of positions: 15, number of connections: 15, product range: FRONT-MC 1,5/-STF, pitch: 3.81 mm, connection method: Front screw connection, screw head form: L Slotted, conductor/PCB connection direction: 0 °, plug-in system: COMBICON MC 1,5, locking: Screw locking mechanism, mounting method: Screw flange, type of packaging: packed in cardboard

## Your advantages

- Well-known connection principle allows worldwide use
- Low temperature rise, thanks to maximum contact force
- Screwable flange for superior mechanical stability
- Optimized for tight installation situations: operation and conductor connection from one direction

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1850987       |
| Packing unit                         | 50 pc         |
| Minimum order quantity               | 50 pc         |
| Sales key                            | AA02          |
| Product key                          | AABALB        |
| GTIN                                 | 4017918110017 |
| Weight per piece (including packing) | 20.586 g      |
| Weight per piece (excluding packing) | 18.928 g      |
| Customs tariff number                | 85366990      |
| Country of origin                    | PL            |

# FRONT-MC 1,5/15-STF-3,81 - PCB connector



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## Technical data

### Product properties

|                       |                       |
|-----------------------|-----------------------|
| Product type          | PCB connector         |
| Product family        | FRONT-MC 1,5/...-STF  |
| Product line          | COMBICON Connectors S |
| Type                  | Standard              |
| Number of positions   | 15                    |
| Pitch                 | 3.81 mm               |
| Number of connections | 15                    |
| Number of rows        | 1                     |
| Number of potentials  | 15                    |
| Mounting type         | Screw flange          |

### Electrical properties

#### Properties

|                             |        |
|-----------------------------|--------|
| Nominal current $I_N$       | 8 A    |
| Nominal voltage $U_N$       | 160 V  |
| Contact resistance          | 1.6 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 MC 1,5     |
| Nominal cross section   | 1.5 mm <sup>2</sup> |
| Contact connection type | Socket              |

#### Interlock

|                   |                         |
|-------------------|-------------------------|
| Locking type      | Screw locking mechanism |
| Mounting type     | Screw flange            |
| Tightening torque | 0.3 Nm                  |

#### Conductor connection

|                                    |                                              |
|------------------------------------|----------------------------------------------|
| Connection method                  | Front screw connection                       |
| Conductor/PCB connection direction | 0 °                                          |
| Conductor cross-section rigid      | 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section flexible   | 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |

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|                                                                                           |                                               |
|-------------------------------------------------------------------------------------------|-----------------------------------------------|
| Conductor cross-section AWG                                                               | 28 ... 16                                     |
| Conductor cross-section flexible, with ferrule without plastic sleeve                     | 0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>  |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve                      | 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>  |
| 2 conductors with same cross section, solid                                               | 0.14 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>  |
| 2 conductors with same cross section, flexible                                            | 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> |
| 2 conductors with same cross section, flexible, with ferrule without plastic sleeve       | 0.25 mm <sup>2</sup> ... 0.34 mm <sup>2</sup> |
| 2 conductors with the same cross section, flexible, with TWIN ferrule with plastic sleeve | 0.5 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>   |
| Cylindrical gauge a x b / diameter                                                        | 2.4 mm x 1.5 mm / 1.6 mm                      |
| Stripping length                                                                          | 9 mm                                          |
| Drive form screw head                                                                     | Slotted (L)                                   |
| Tightening torque                                                                         | 0.22 Nm ... 0.25 Nm                           |

## Specifications for ferrules without insulating collar

|                                                              |                                                             |
|--------------------------------------------------------------|-------------------------------------------------------------|
| ferrules without insulating collar, according to DIN 46228-1 | Cross section: 0.25 mm <sup>2</sup> ; Length: 7 mm ... 9 mm |
|                                                              | Cross section: 0.34 mm <sup>2</sup> ; Length: 7 mm ... 9 mm |
|                                                              | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm ... 9 mm  |
|                                                              | Cross section: 0.75 mm <sup>2</sup> ; Length: 8 mm ... 9 mm |
|                                                              | Cross section: 1 mm <sup>2</sup> ; Length: 8 mm ... 9 mm    |
|                                                              | Cross section: 1.5 mm <sup>2</sup> ; Length: 9 mm           |

## Specifications for ferrules with insulating collar

|                                                           |                                                             |
|-----------------------------------------------------------|-------------------------------------------------------------|
| ferrules with insulating collar, according to DIN 46228-4 | Cross section: 0.25 mm <sup>2</sup> ; Length: 8 mm ... 9 mm |
|                                                           | Cross section: 0.34 mm <sup>2</sup> ; Length: 8 mm ... 9 mm |
|                                                           | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm ... 9 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          |

# FRONT-MC 1,5/15-STF-3,81 - PCB connector



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Temperature for the ball pressure test according to EN 60695-10-2

125 °C

## Dimensions

Dimensional drawing



Pitch

3.81 mm

Width [w]

67.54 mm

Height [h]

12.3 mm

Length [l]

21.7 mm

## Mounting

Flange

Tightening torque

0.3 Nm

## 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

0.14 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.

7 N

Withdraw strength per pos. approx.

5 N

Torque test

Specification

IEC 60999-1:1999-11

Resistance of inscriptions

Specification

IEC 60068-2-70:1995-12

Result

Test passed

Polarization and coding

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|               |                        |
|---------------|------------------------|
| 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 $R_1$                     | 1.6 mΩ                |
| Contact resistance $R_2$                     | 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                                                                   |

### Shocks

|                 |                                   |
|-----------------|-----------------------------------|
| Specification   | IEC 60068-2-27:2008-02            |
| Pulse shape     | Semi-sinusoidal                   |
| Acceleration    | 30g                               |
| Shock duration  | 18 ms                             |
| Test directions | X-, Y- and Z-axis (pos. and neg.) |

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

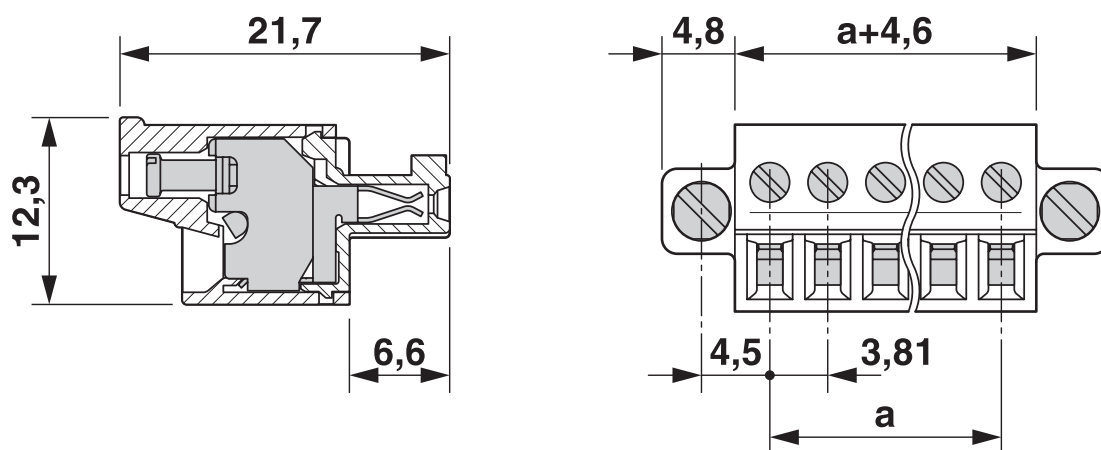
# FRONT-MC 1,5/15-STF-3,81 - PCB connector

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## Drawings

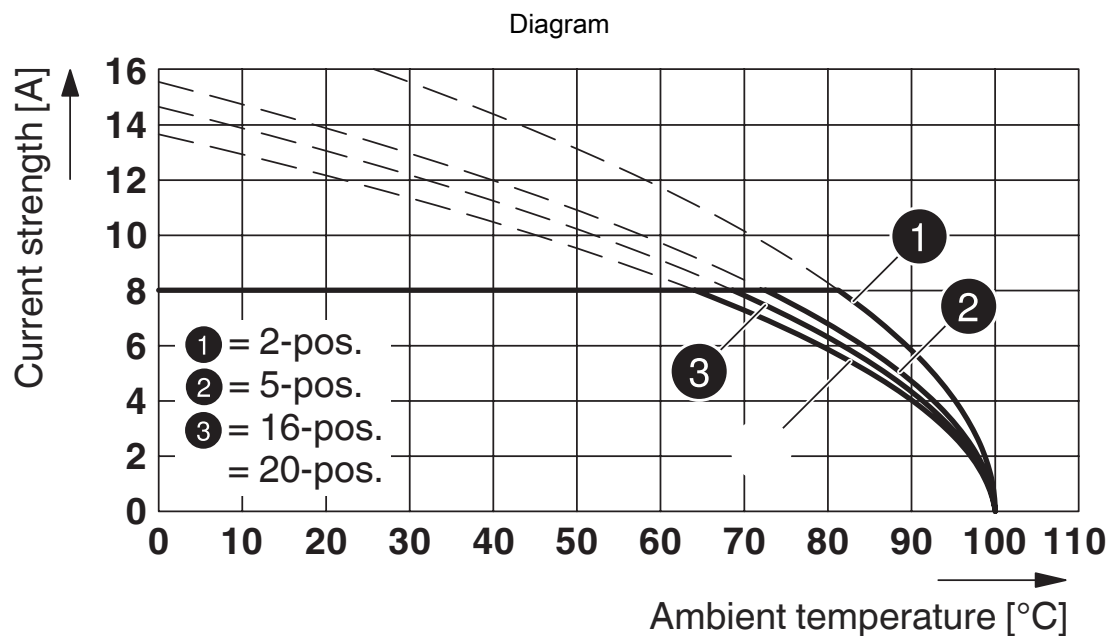
Dimensional drawing



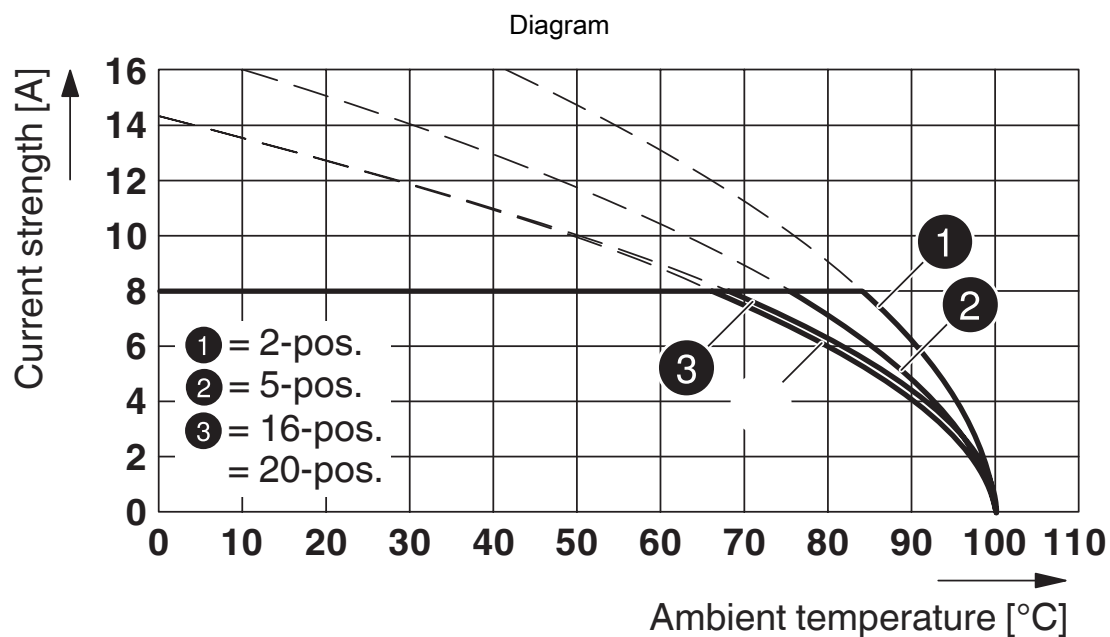
Diagram



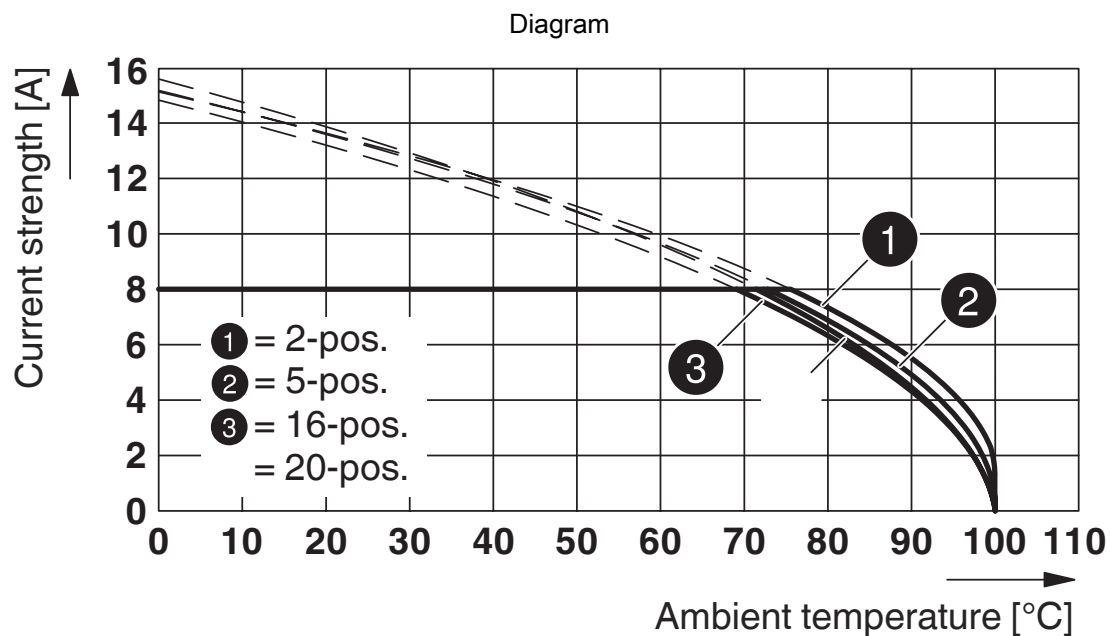
Type: FRONT-MC 1,5/...-STF-3,81 with MCV 1,5/...-GF-3,81



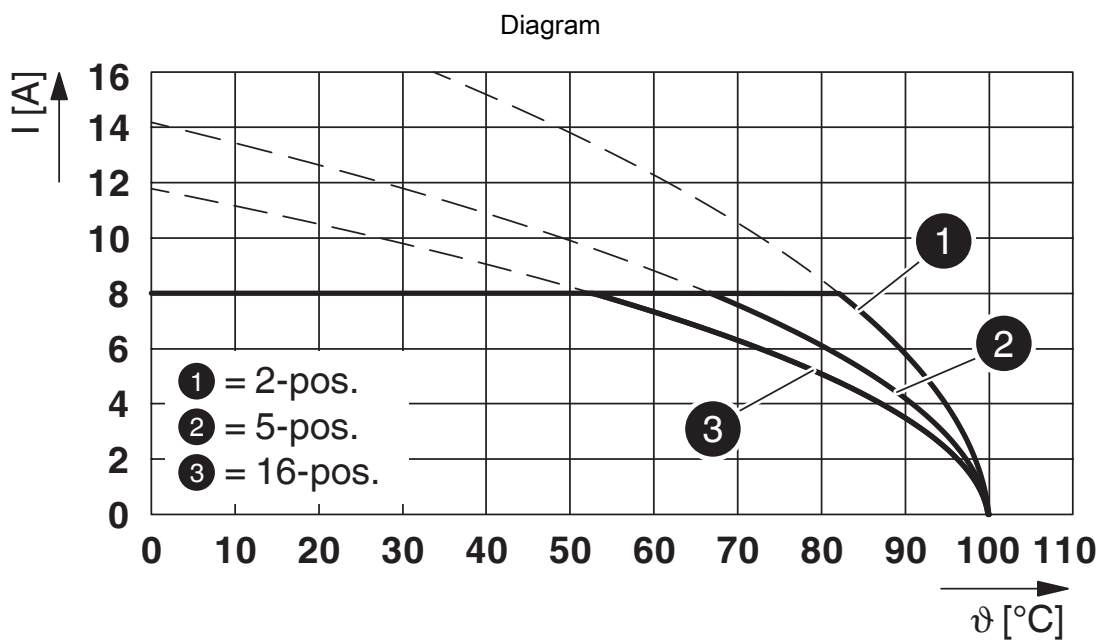
Type: FRONT-MC 1,5/...-STF-3,81 with MC 1,5/...-GF-3,81



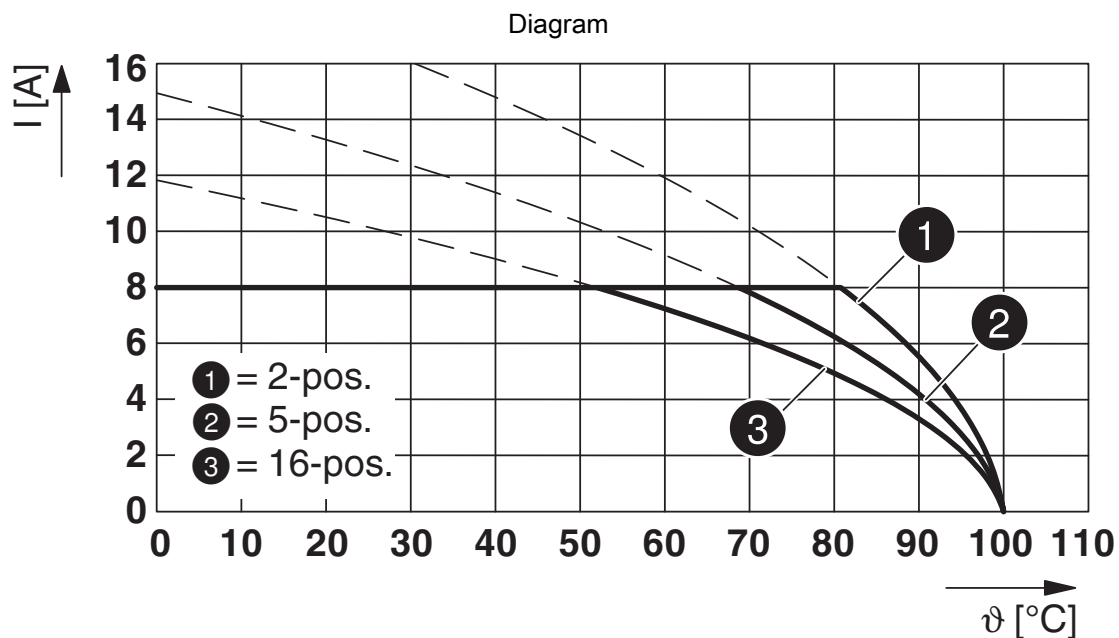
Type: FRONT-MC 1,5/...-STF-3,81 with MC 1,5/...-GF-3,81 P...THR



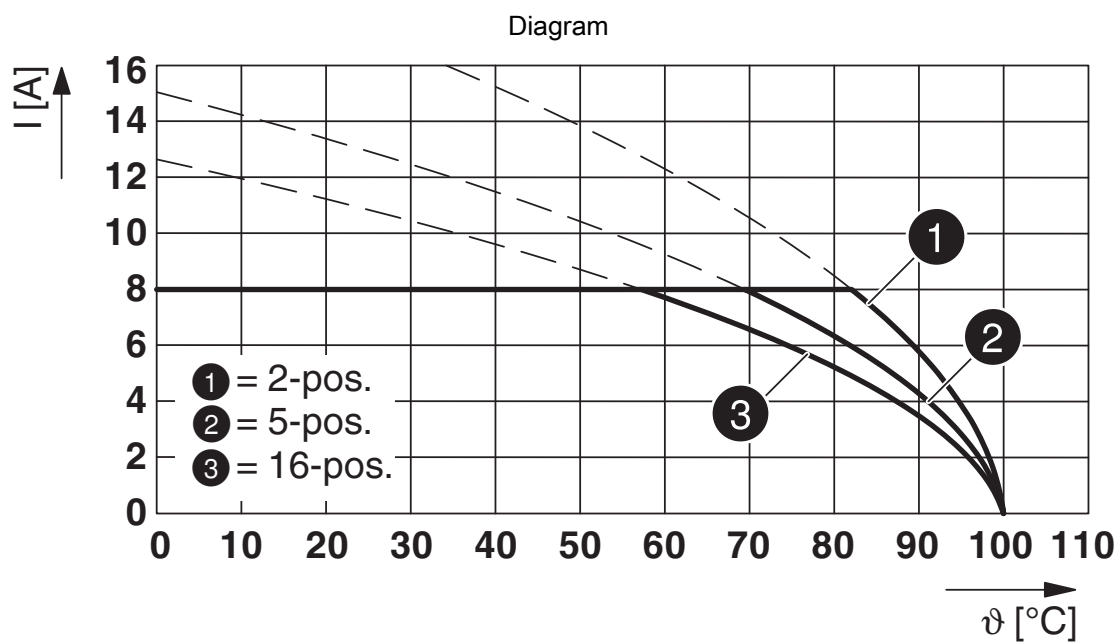
Type: FRONT-MC 1,5/...-STF-3,81 with MCV 1,5/...-GF-3,81 P... THR



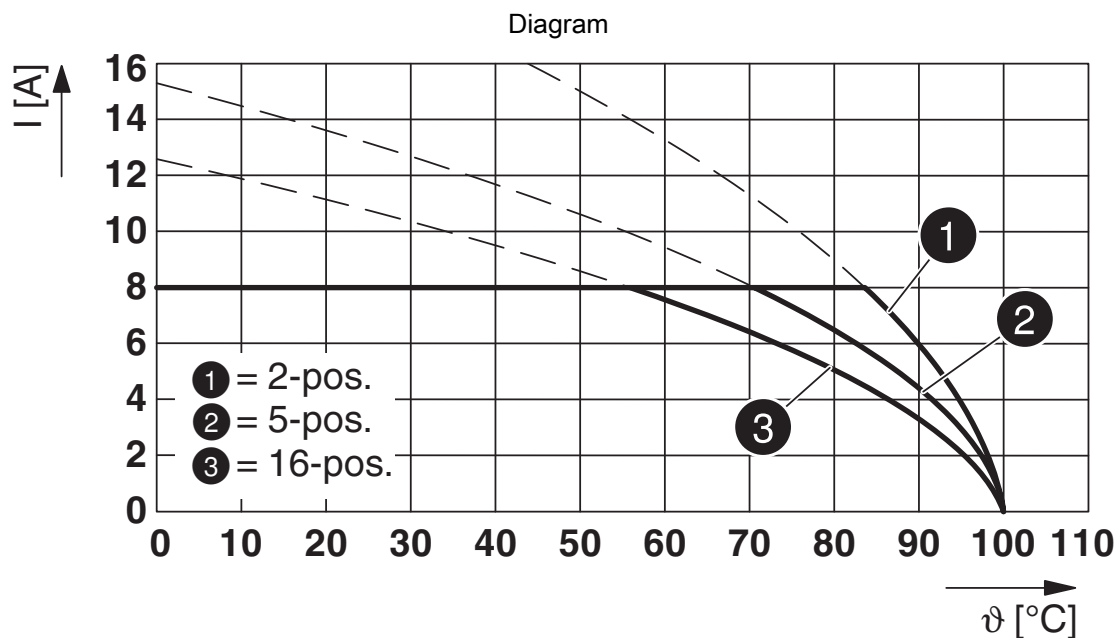
Type: FRONT-MC 1,5/...-ST-3,81 with MCD 1,5/...-GF-3,81



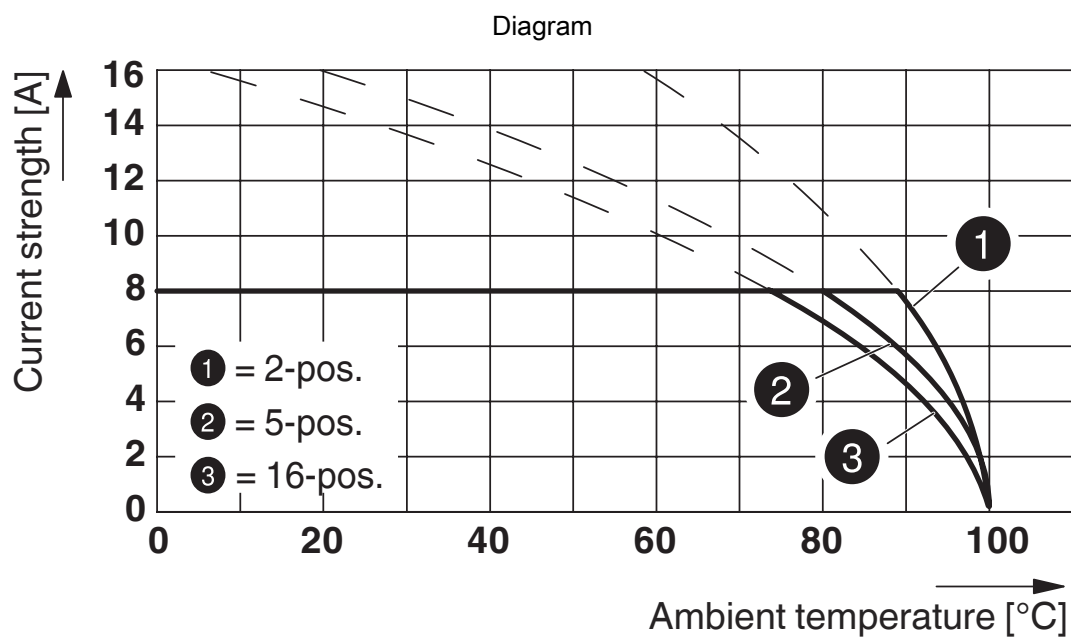
Type: FRONT-MC 1,5/...-STF-3,81 with MCD 1,5/...-G1F-3,81



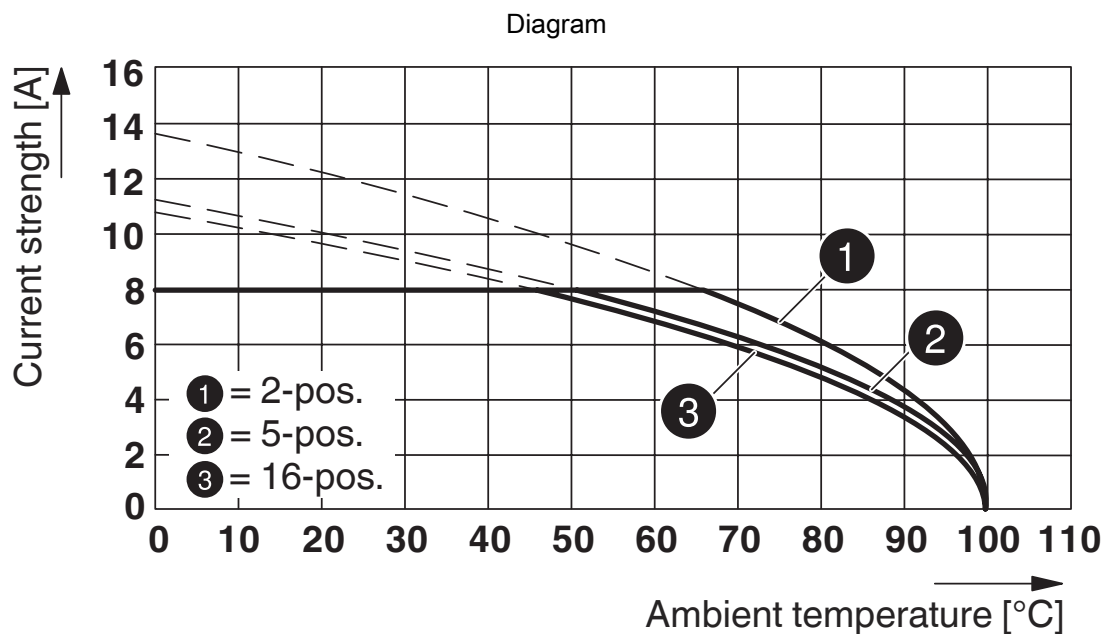
Type: FRONT-MC 1,5/...-STF-3,81 with MCDV 1,5/...-GF-3,81



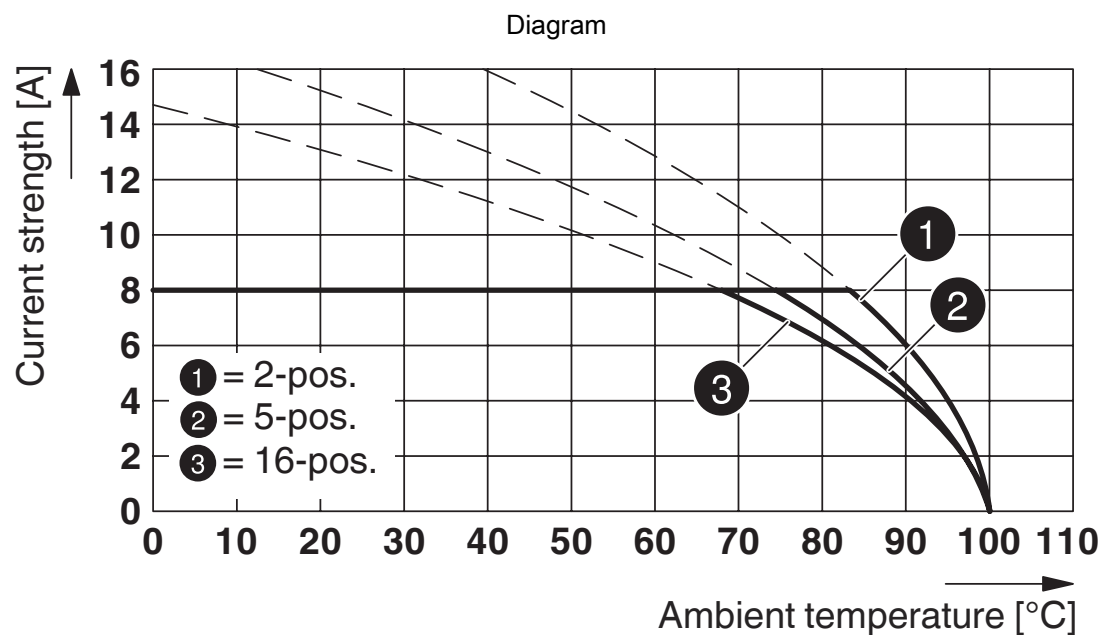
Type: FRONT-MC 1,5/...-STF-3,81 with MCDV 1,5/...-G1F-3,81



Type: FRONT-MC 1,5/...-STF-3,81 with SMC 1,5/...-GF-3,81



Type: FFRONT-MC 1,5/...-STF-3,81 with DFK-MC 1,5/...-GF-3,81



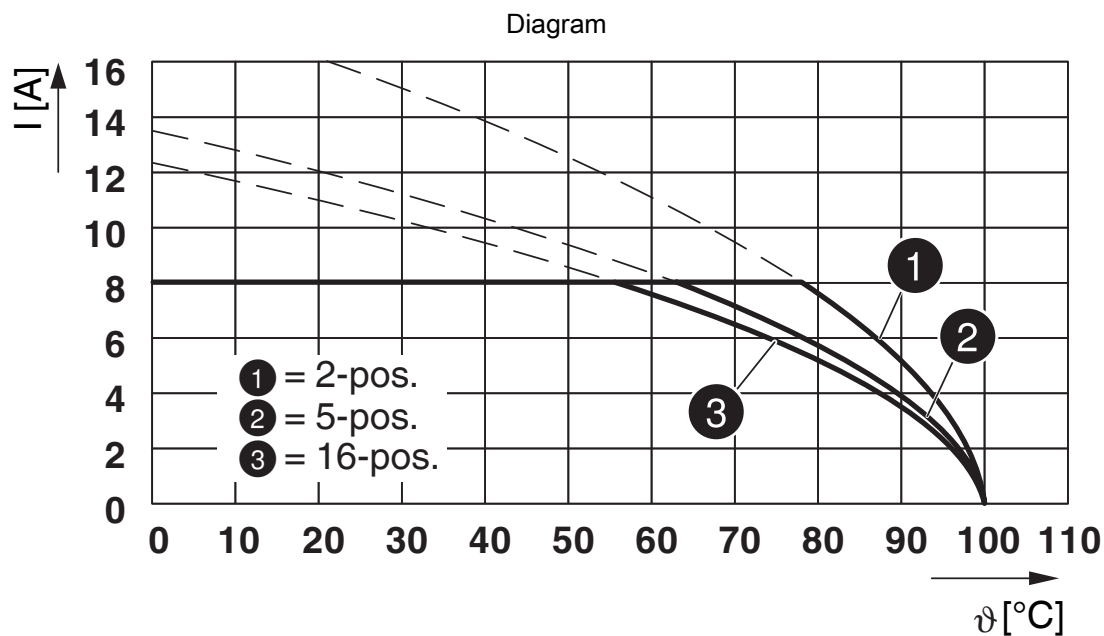
Type: FRONT-MC 1,5/...-STF-3,81 with IMC 1,5/...-STGF-3,81

# FRONT-MC 1,5/15-STF-3,81 - PCB connector



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Type: FRONT-MC 1,5/...-STF-3,81 with MCVU 1,5/...-GFD-3,81

# FRONT-MC 1,5/15-STF-3,81 - PCB connector



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1850987>

|  <b>CSA</b><br>Approval ID: 13631 |                       |                       |                   |                             |
|--------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                    | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B                                                                                                                  |                       |                       |                   |                             |
|                                                                                                                    | 300 V                 | 8 A                   | 28 - 16           | -                           |
| D                                                                                                                  |                       |                       |                   |                             |
|                                                                                                                    | 300 V                 | 8 A                   | 28 - 16           | -                           |

|  <b>cULus Recognized</b><br>Approval ID: E60425-20110128 |                       |                       |                   |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                                           | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B                                                                                                                                         |                       |                       |                   |                             |
|                                                                                                                                           | 300 V                 | 8 A                   | 30 - 16           | -                           |
| D                                                                                                                                         |                       |                       |                   |                             |
|                                                                                                                                           | 300 V                 | 8 A                   | 30 - 16           | -                           |

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

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

# FRONT-MC 1,5/15-STF-3,81 - PCB connector



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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%               |

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