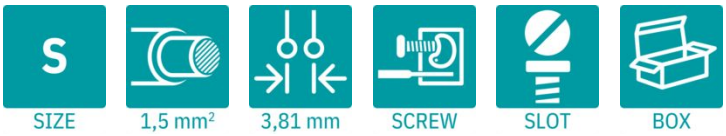
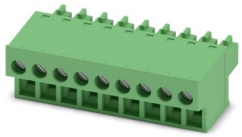
# FRONT-MC 1,5/ 9-ST-3,81 - PCB connector

1850738

https://www.phoenixcontact.com/us/products/1850738

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PCB connector, nominal cross section: 1.5 mm$^2$, 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: FRONT-MC 1,5/..-ST, 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: without, mounting method: without, type of packaging: packed in cardboard

## Your advantages

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

## Commercial data

| | |
|---|---|
| Item number | 1850738 |
| Packing unit | 50 pc |
| Minimum order quantity | 50 pc |
| Note | Made to order (non-returnable) |
| Sales key | AA02 |
| Product key | AABALA |
| GTIN | 4017918109783 |
| Weight per piece (including packing) | 11.84 g |
| Weight per piece (excluding packing) | 11.39 g |
| Customs tariff number | 85366990 |
| Country of origin | PL |

# Technical data

## Product properties

| | |
|---|---|
| Product type | PCB connector |
| Product family | FRONT-MC 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 |

Fitting of components

| | |
|---|---|
| Partial assembly | No |

## 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 mm² |
| Contact connection type | Socket |

Interlock

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

Conductor connection

| | |
|---|---|
| Connection method | Front screw connection |
| Conductor/PCB connection direction | 0 ° |
| Conductor cross-section rigid | 0.14 mm² ... 1.5 mm² |

| | |
|---|---|
| Conductor cross-section flexible | 0.14 mm² ... 1.5 mm² |
| Conductor cross-section AWG | 28 ... 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 | 0.25 mm² ... 0.5 mm² |
| 2 conductors with same cross section, rigid | 0.14 mm² ... 0.5 mm² |
| 2 conductors with same cross section, flexible | 0.14 mm² ... 0.75 mm² |
| 2 conductors with same cross section, flexible, with ferrule without plastic sleeve | 0.25 mm² ... 0.34 mm² |
| 2 conductors with the same cross section, flexible, with TWIN ferrule with plastic sleeve | 0.5 mm² ... 0.5 mm² |
| 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 mm²; Length: 7 mm ... 9 mm |
| | Cross section: 0.34 mm²; Length: 7 mm ... 9 mm |
| | Cross section: 0.5 mm²; Length: 8 mm ... 9 mm |
| | Cross section: 0.75 mm²; Length: 8 mm ... 9 mm |
| | Cross section: 1 mm²; Length: 8 mm ... 9 mm |
| | Cross section: 1.5 mm²; Length: 9 mm |

Specifications for ferrules with insulating collar

| | |
|---|---|
| ferrules with insulating collar, according to DIN 46228-4 | Cross section: 0.25 mm²; Length: 8 mm ... 9 mm |
| | Cross section: 0.34 mm²; Length: 8 mm ... 9 mm |
| | Cross section: 0.5 mm²; Length: 8 mm ... 9 mm |

## Material specifications

Material data - contact

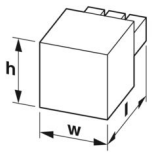
| | |
|---|---|
| Note | WEEE/RoHS-compliant, free of whiskers according to IEC 60068-2-82/JEDEC JESD 201 |
| Contact material | Cu alloy |
| Surface characteristics | hot-dip tin-plated |
| Metal surface terminal point (top layer) | Tin (4 µm - 8 µm Sn) |
| Metal surface contact area (top layer) | Tin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

## Dimensions

| | |
|---|---|
| Dimensional drawing |  |
| Pitch | 3.81 mm |
| Width [w] | 35.08 mm |
| Height [h] | 12.3 mm |
| Length [l] | 21.7 mm |

## 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 mm² / solid / > 10 N |
| | 0.14 mm² / flexible / > 10 N |
| | 1.5 mm² / solid / > 40 N |
| | 1.5 mm² / 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

| | |
|---|---|
| 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 $R_1$ | 1.6 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 $dm^3$ $SO_2$ on 300 $dm^3$/40 °C/1 cycle |
| Thermal stress | 100 °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 |

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 | 20 |

Insulation resistance

| | |
|---|---|
| Specification | IEC 60512-3-1:2002-02 |

| | |
|---|---|
| Insulation resistance, neighboring positions | > 5 MΩ |

Air clearances and creepage distances |

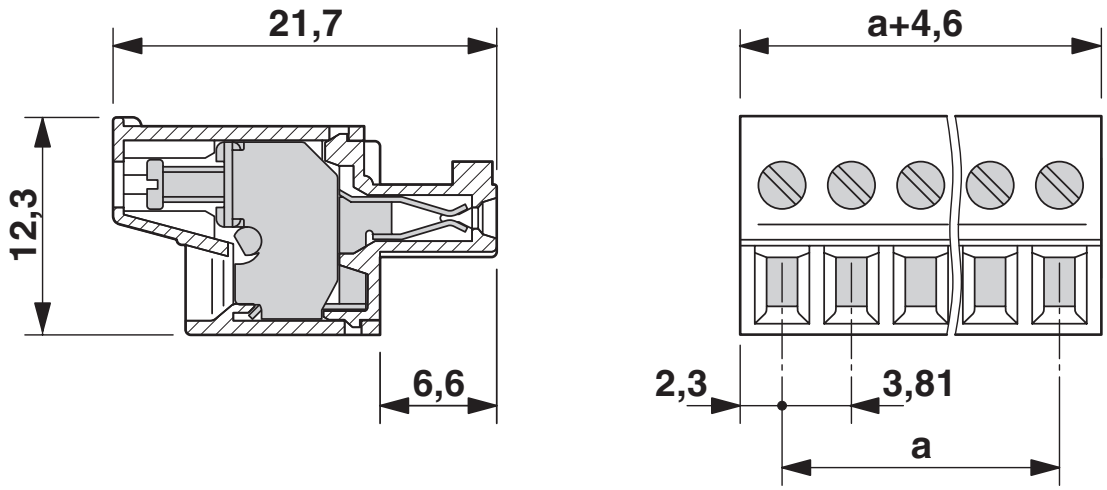
| | |
|---|---|
| Specification | IEC 60664-1:2007-04 |
| Insulating material group | I |
| Comparative tracking index (IEC 60112) | CTI 600 |
| Rated insulation voltage (III/3) | 160 V |
| Rated surge voltage (III/3) | 2.5 kV |
| minimum clearance value - non-homogenous field (III/3) | 1.5 mm |
| minimum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

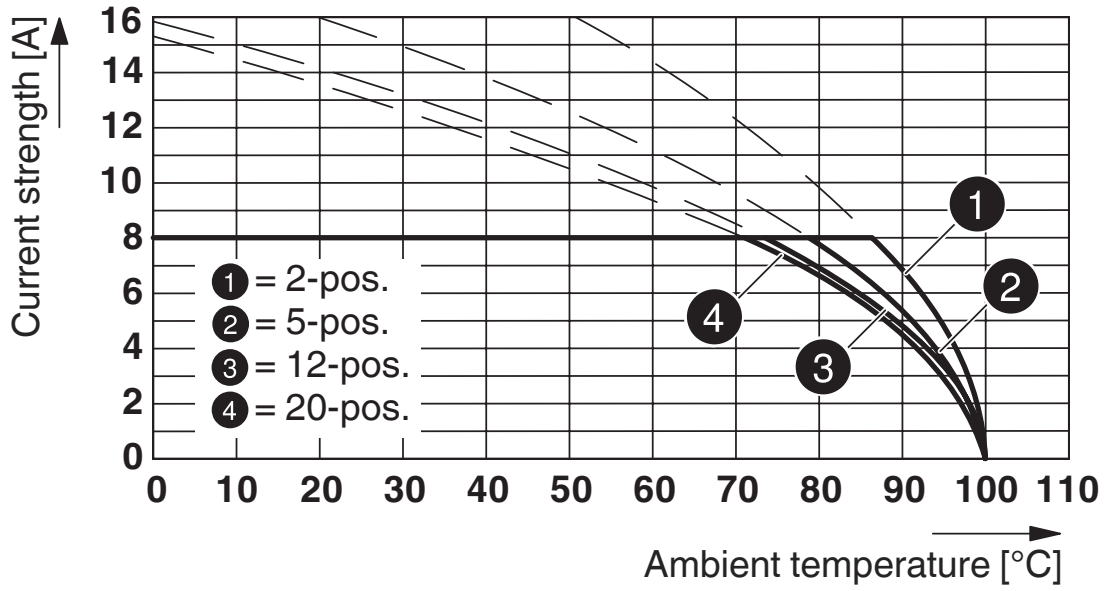
| | |
|---|---|
| Type of packaging | packed in cardboard |

## Drawings

Dimensional drawing

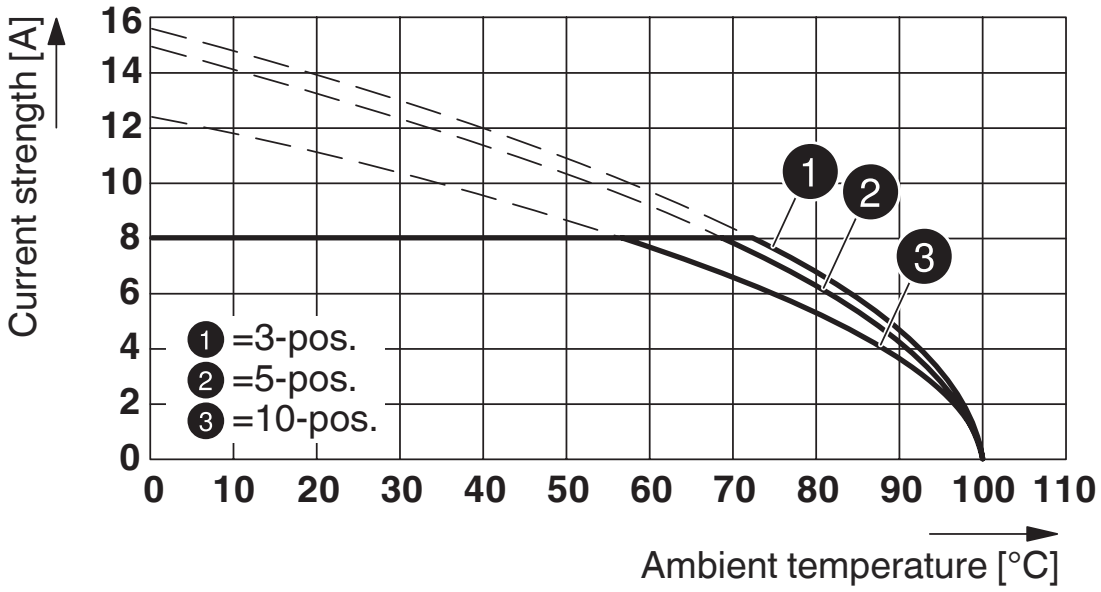



Diagram



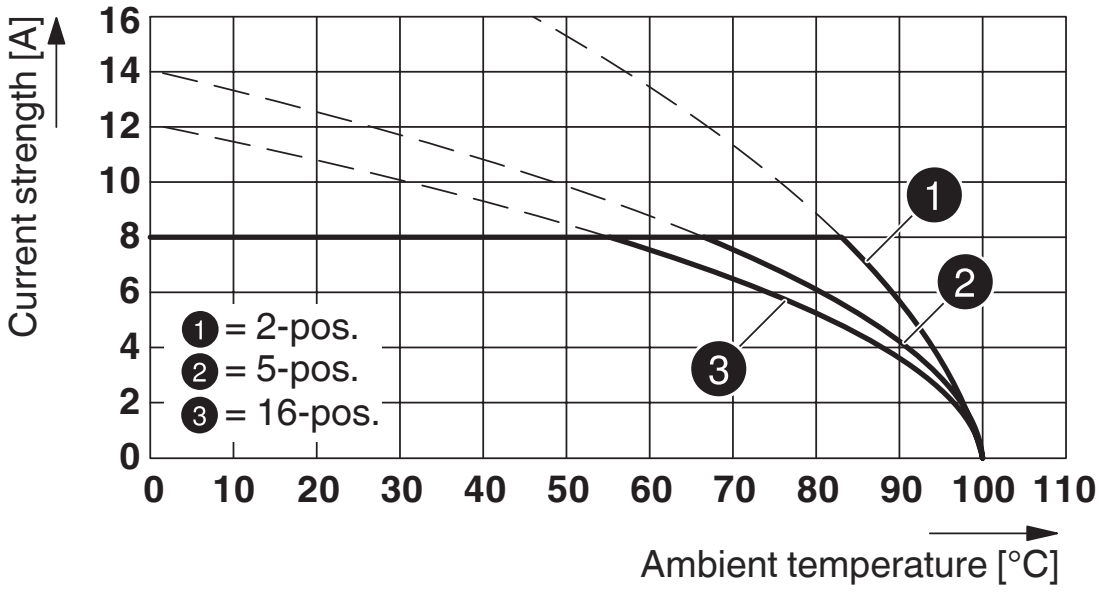

Type: FRONT-MC 1,5/...-ST-3,81 with MCV 1,5/...-G-3,81

Diagram



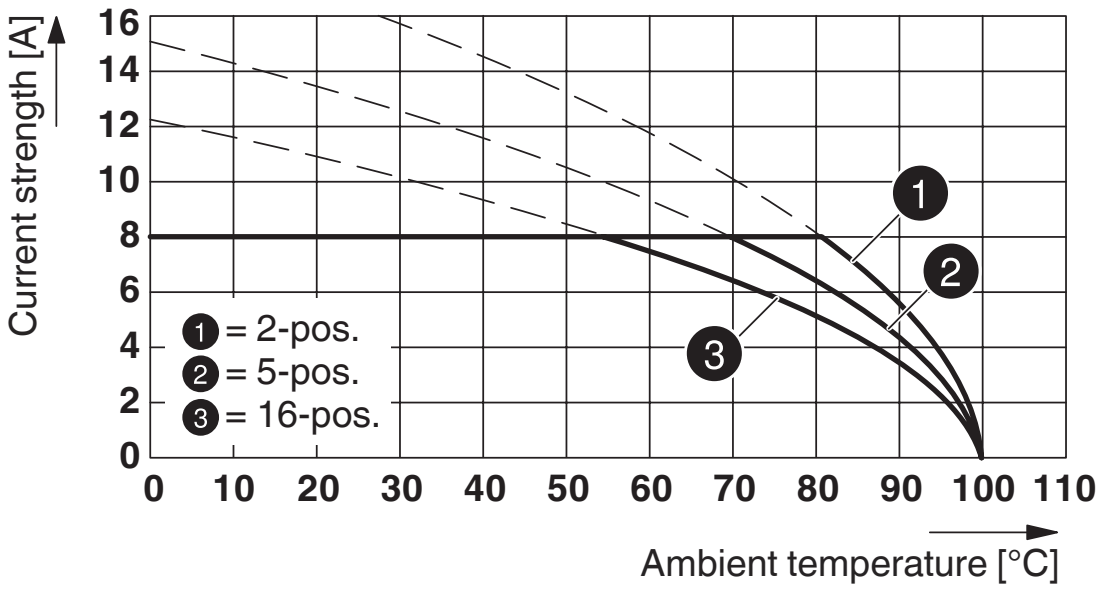

Type: FRONT-MC 1,5/...-ST-3,81 with MCO 1,5/...-GR-3,81

Diagram



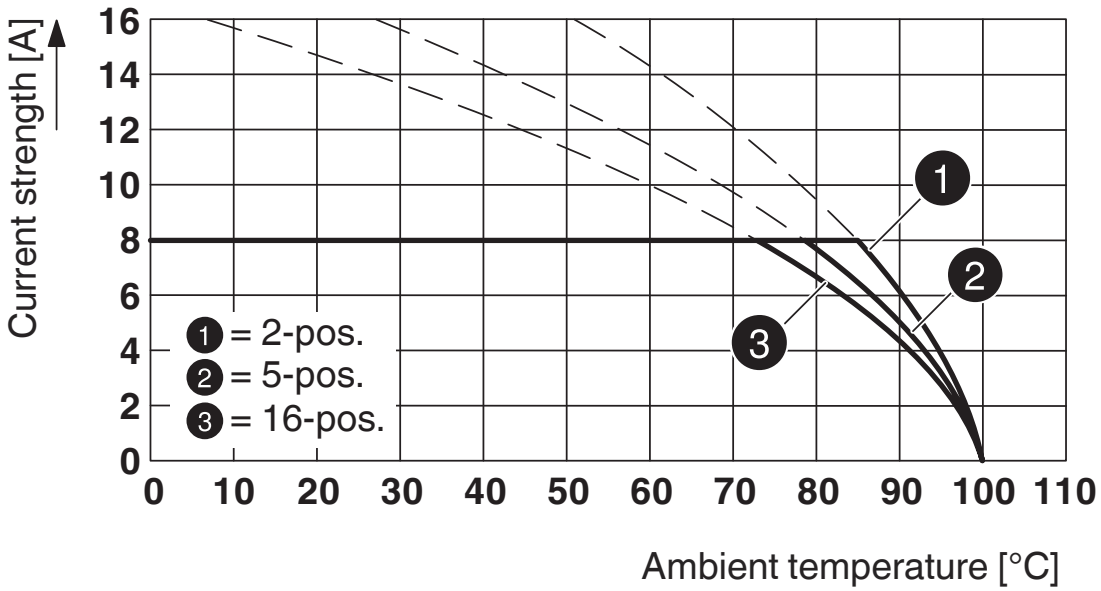

Type: FRONT-MC 1,5/...-ST-3,81 with MCD 1,5/...-G1-3,81

Diagram



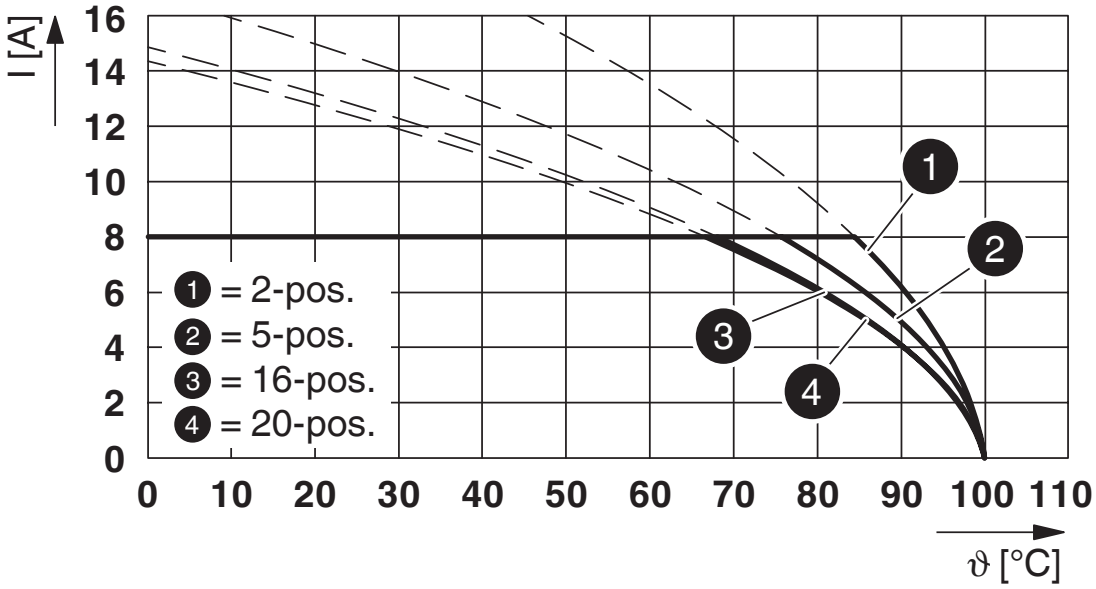

Type: FRONT-MC 1,5/...-ST-3,81 with MCDV 1,5/...-G1-3,81

Diagram



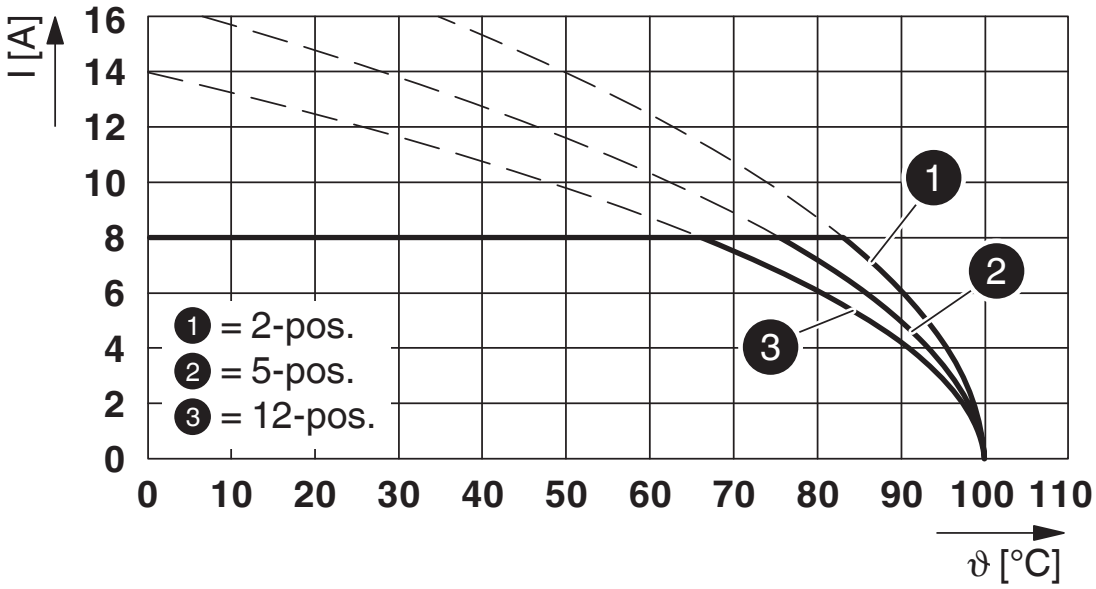

Type: FRONT-MC 1,5/...-ST-3,81 with IMC 1,5/...-ST-3,81

Diagram



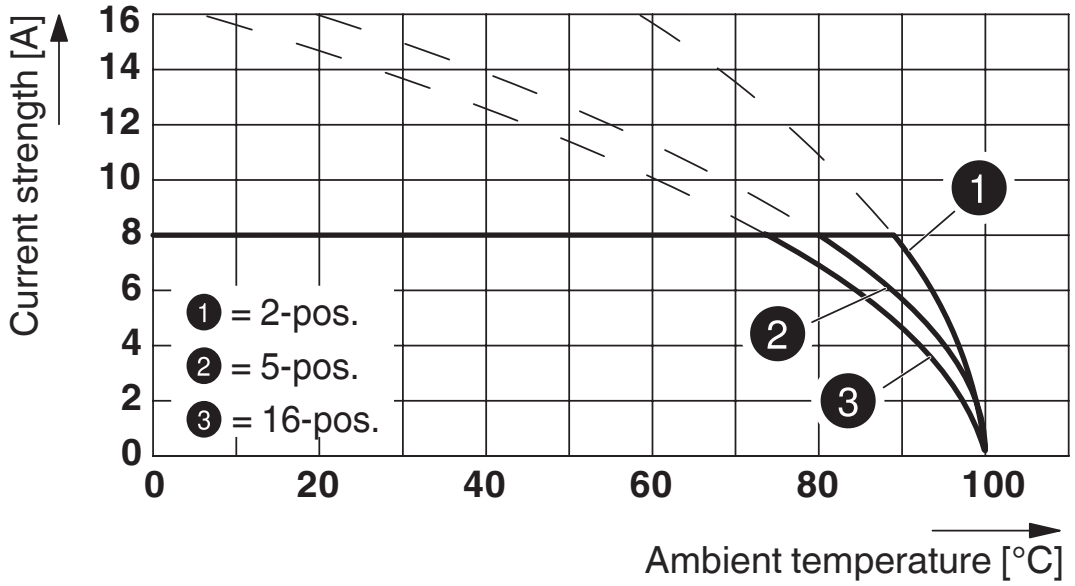

Type: FRONT-MC 1,5/...-ST-3,81 with MC 1,5/...-G-3,81

Diagram



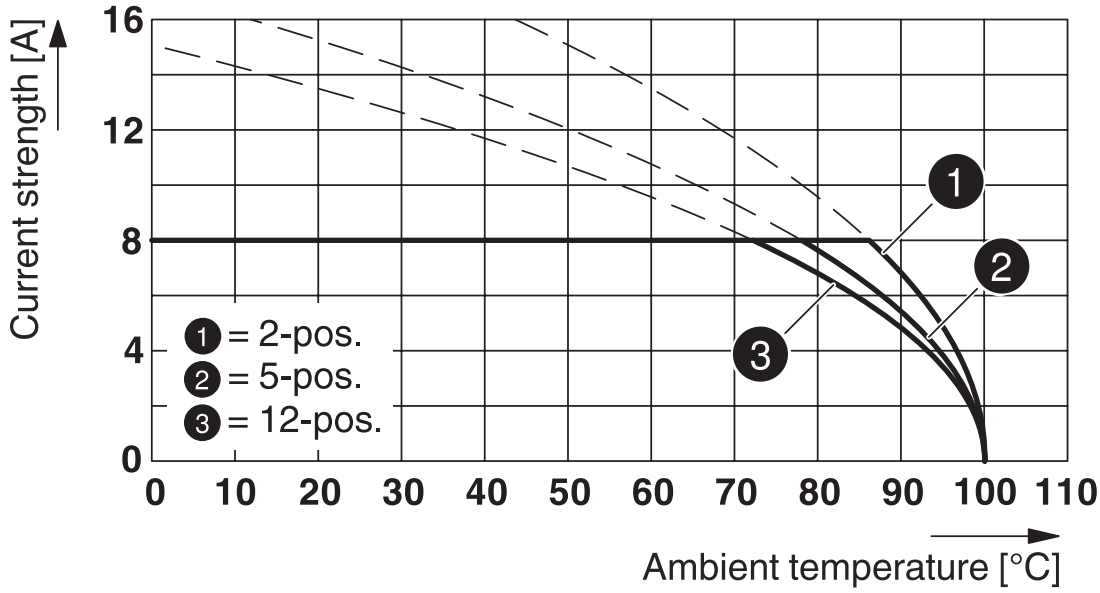

Type: FRONT-MC 1,5/...-ST-3,81 with MC 1,5/...-G-3,81 P... THR

Diagram



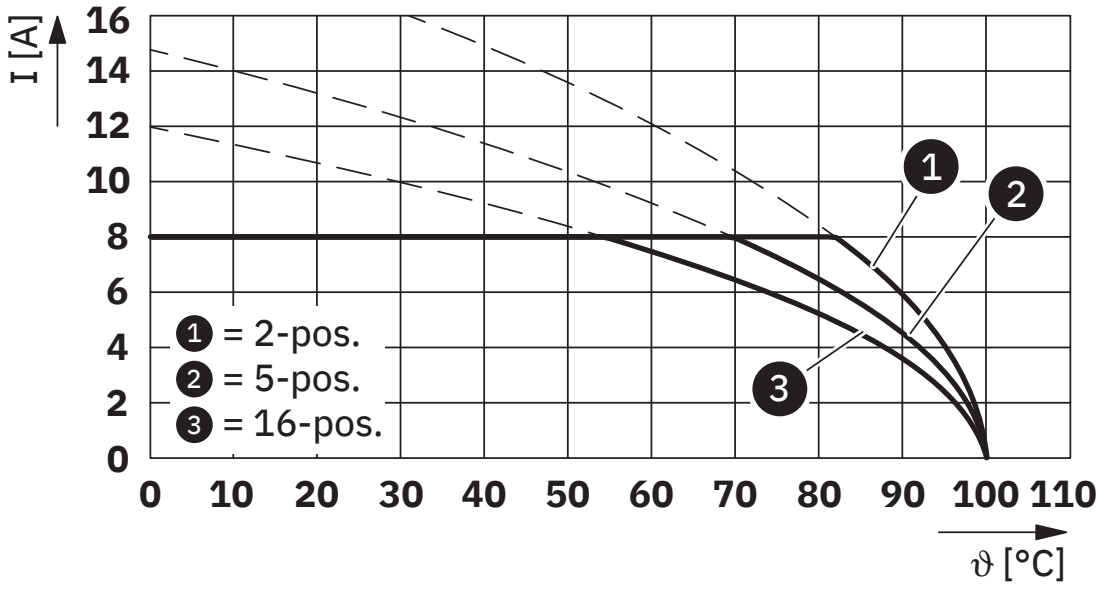

Type: FRONT-MC 1,5/...-ST-3,81 with SMC 1,5/...-G-3,81

Diagram




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

Diagram




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

## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/1850738

**CSA**
Approval ID: 2406780

| | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
|---|---|---|---|---|
| B | | | | |
| | 300 V | 8 A | 28 - 16 | - |
| D | | | | |
| | 300 V | 8 A | 28 - 16 | - |

**cULus Recognized**
Approval ID: E60425-20110128

| | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
|---|---|---|---|---|
| B | | | | |
| | 300 V | 8 A | 30 - 16 | - |
| D | | | | |
| | 300 V | 8 A | 30 - 16 | - |

**VDE Zeichengenehmigung**
Approval ID: 40011723

| | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $mm^2$ |
|---|---|---|---|---|
| keine | | | | |
| | 160 V | 8 A | - | 0.2 - 1.5 |

## Classifications

### ECLASS

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

### ETIM

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

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 39121400 |

## 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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