

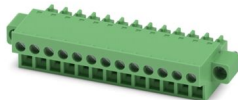
# FRONT-MC 1,5/13-STF-3,81 - PCB connector



1850961

<https://www.phoenixcontact.com/us/products/1850961>

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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: 13, number of rows: 1, number of positions: 13, number of connections: 13, 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	1850961
Packing unit	50 pc
Minimum order quantity	50 pc
Sales key	AA02
Product key	AABALB
GTIN	4017918110048
Weight per piece (including packing)	17.97 g
Weight per piece (excluding packing)	17.192 g
Customs tariff number	85366990
Country of origin	PL

# FRONT-MC 1,5/13-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	13
Pitch	3.81 mm
Number of connections	13
Number of rows	1
Number of potentials	13
Mounting type	Screw flange

### Electrical properties

#### Properties

Nominal current $I_N$	8 A
Nominal voltage $U_N$	160 V
Contact resistance	1.6 m $\Omega$
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, rigid	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 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

# FRONT-MC 1,5/13-STF-3,81 - PCB connector

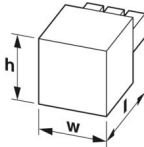


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Temperature for the ball pressure test according to EN 60695-10-2	125 °C
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## Dimensions

Dimensional drawing	
Pitch	3.81 mm
Width [w]	59.92 mm
Height [h]	12.3 mm
Length [l]	21.7 mm

## Mounting

### Flange

Tightening torque	0.3 Nm
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## 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
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### 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

### Durability test

Specification	IEC 60512-9-1:2010-03
Impulse withstand voltage at sea level	2.95 kV
Contact resistance $R_1$	1.6 m $\Omega$
Contact resistance $R_2$	1.7 m $\Omega$
Insertion/withdrawal cycles	25
Insulation resistance, neighboring positions	> 5 M $\Omega$

### 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

### 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

### 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.)

### Railway application: Shocks

Acceleration	30g
Shock duration	18 ms
Test directions	X-, Y- and Z-axis (pos. and neg.)

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## 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
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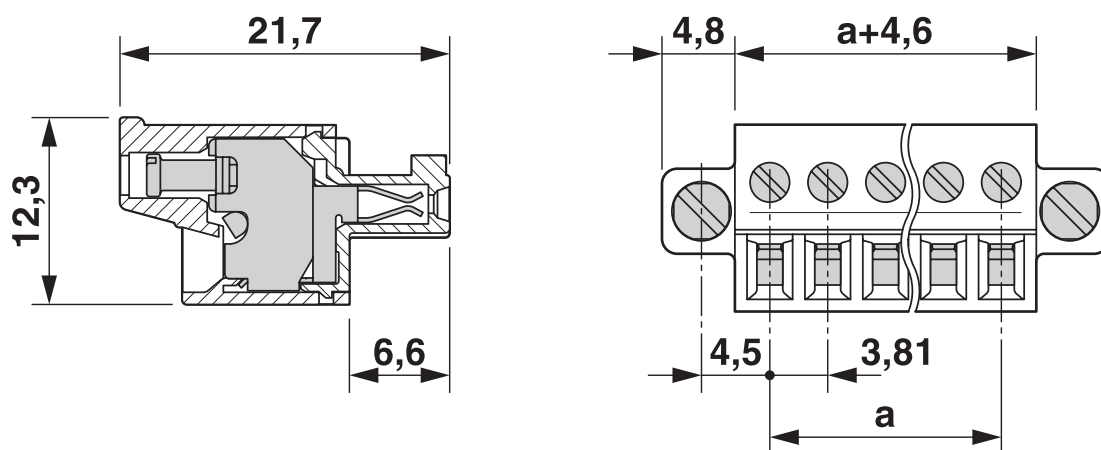


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## Drawings

Dimensional drawing



Diagram



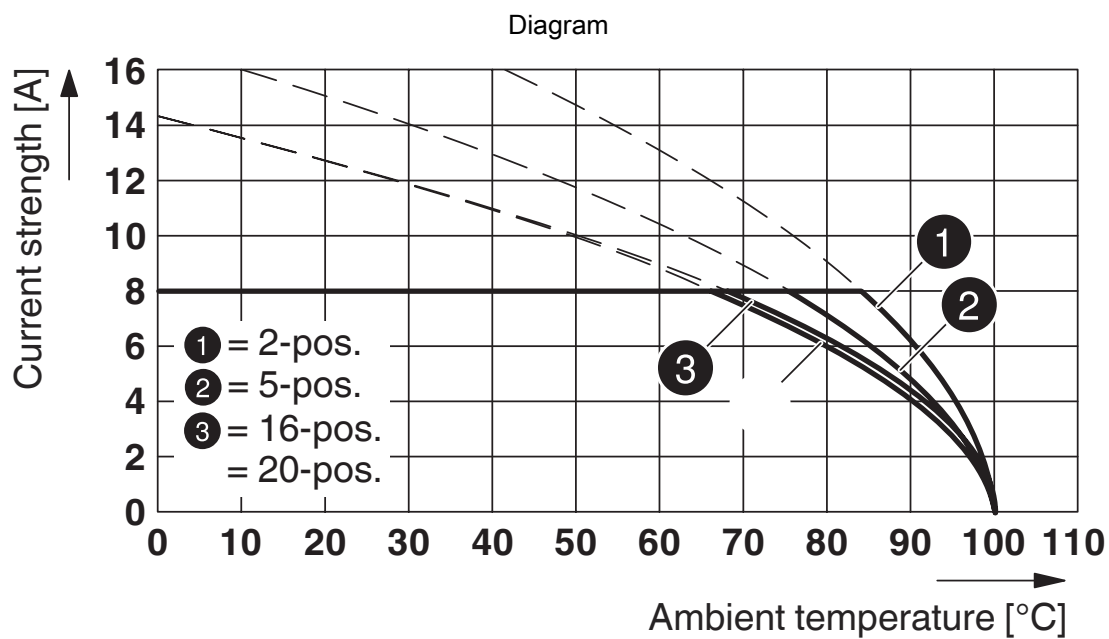
Type: FRONT-MC 1,5/...-STF-3,81 with MCV 1,5/...-GF-3,81

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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

# FRONT-MC 1,5/13-STF-3,81 - PCB connector

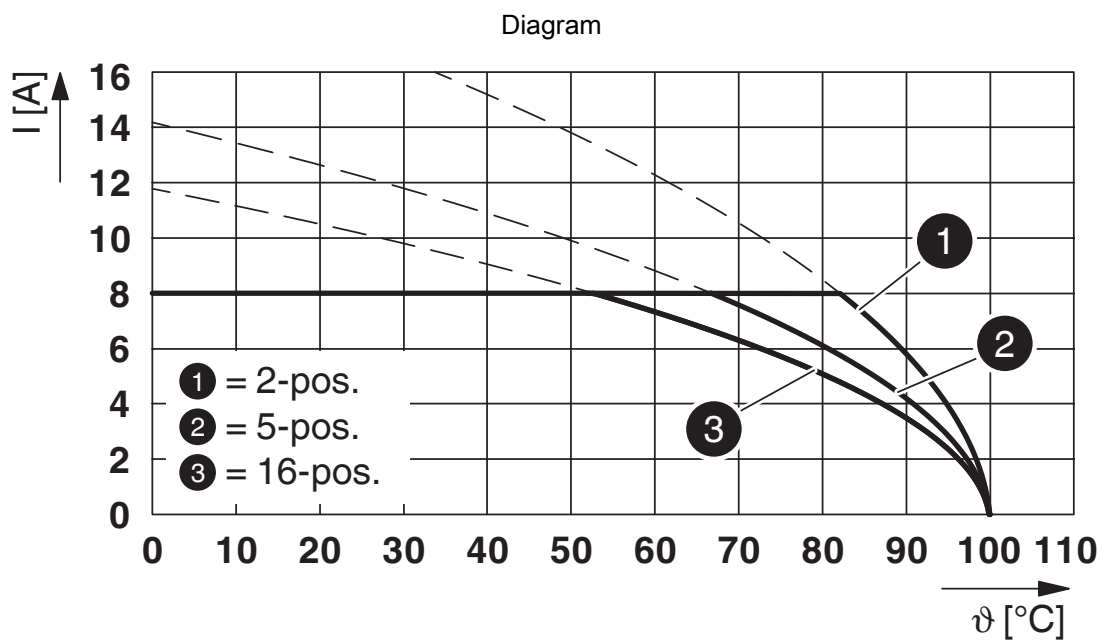


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Type: FRONT-MC 1,5/...-STF-3,81 with MCV 1,5/...-GF-3,81 P... THR



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

# FRONT-MC 1,5/13-STF-3,81 - PCB connector



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



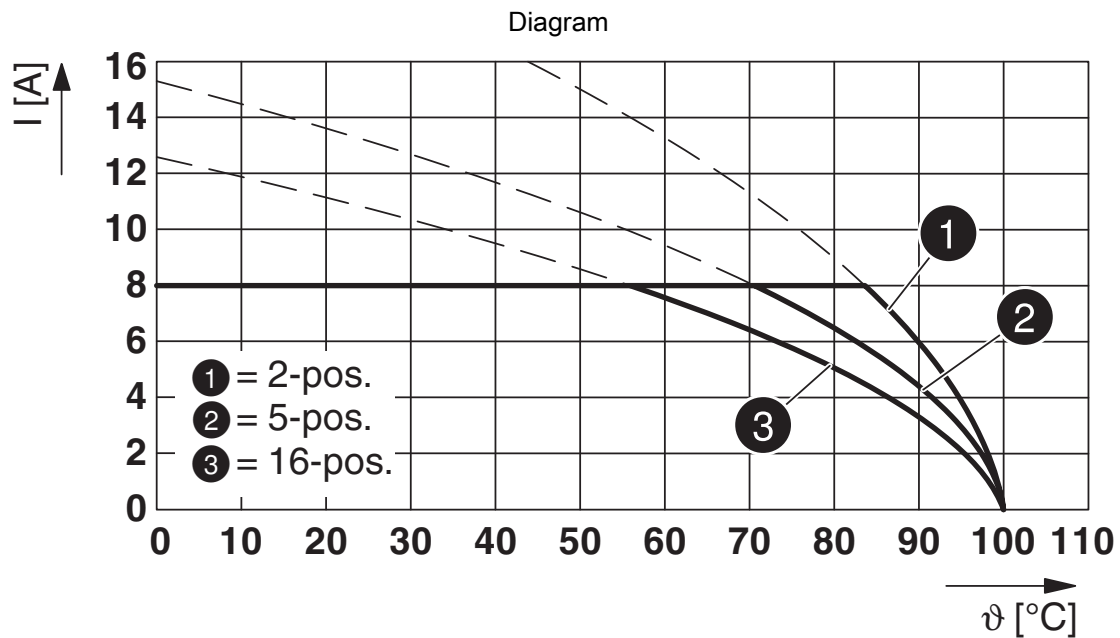
Type: FRONT-MC 1,5/...-STF-3,81 with MCDV 1,5/...-GF-3,81

# FRONT-MC 1,5/13-STF-3,81 - PCB connector

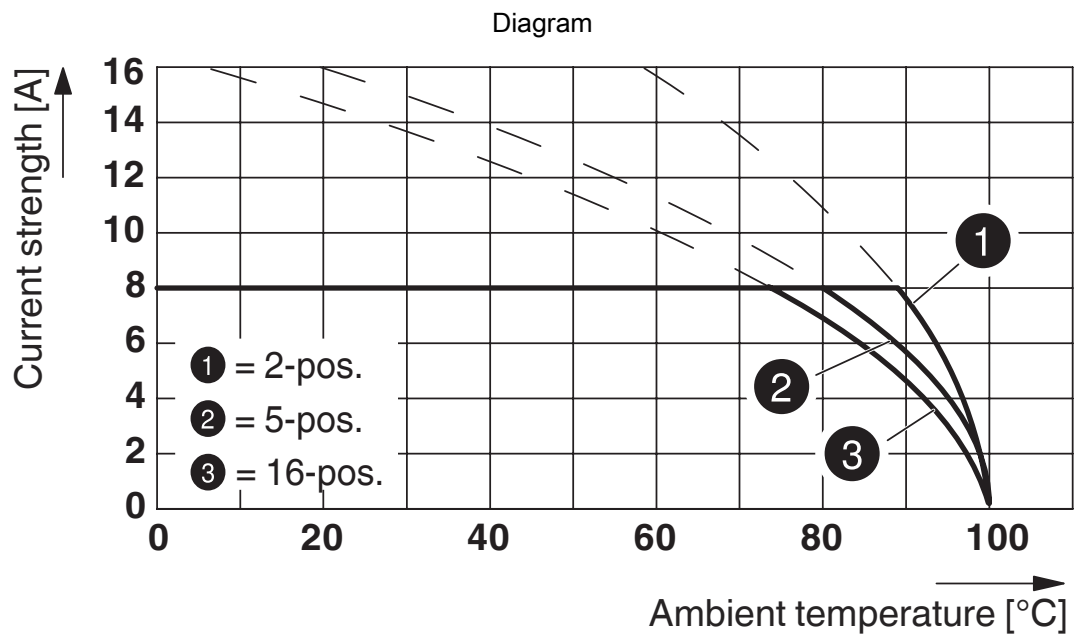


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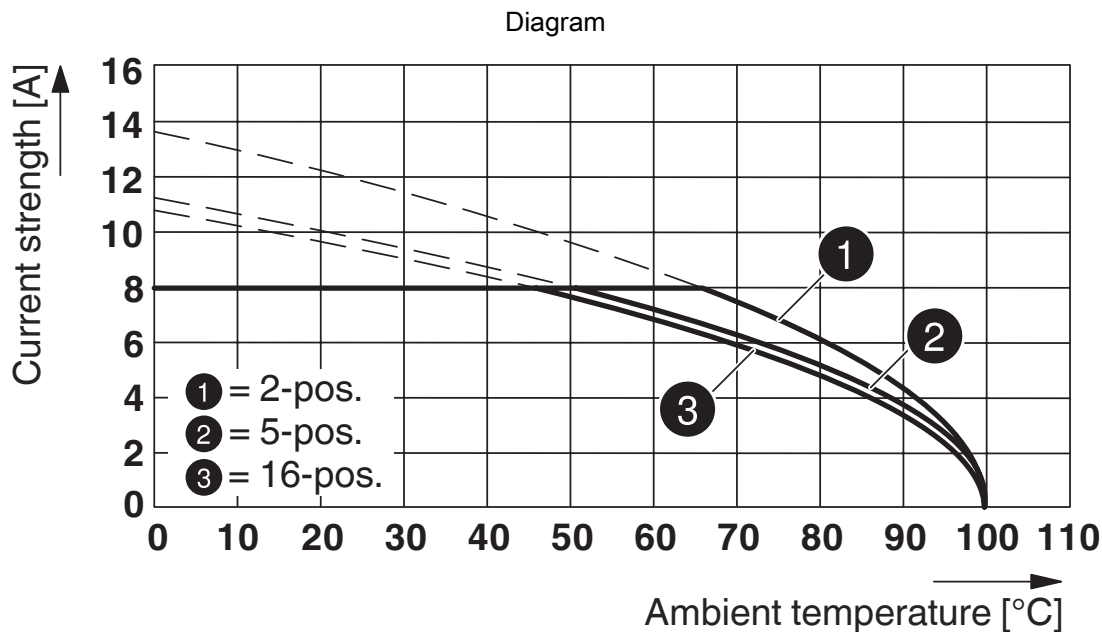
Type: FRONT-MC 1,5/...-STF-3,81 with MCDV 1,5/...-G1F-3,81



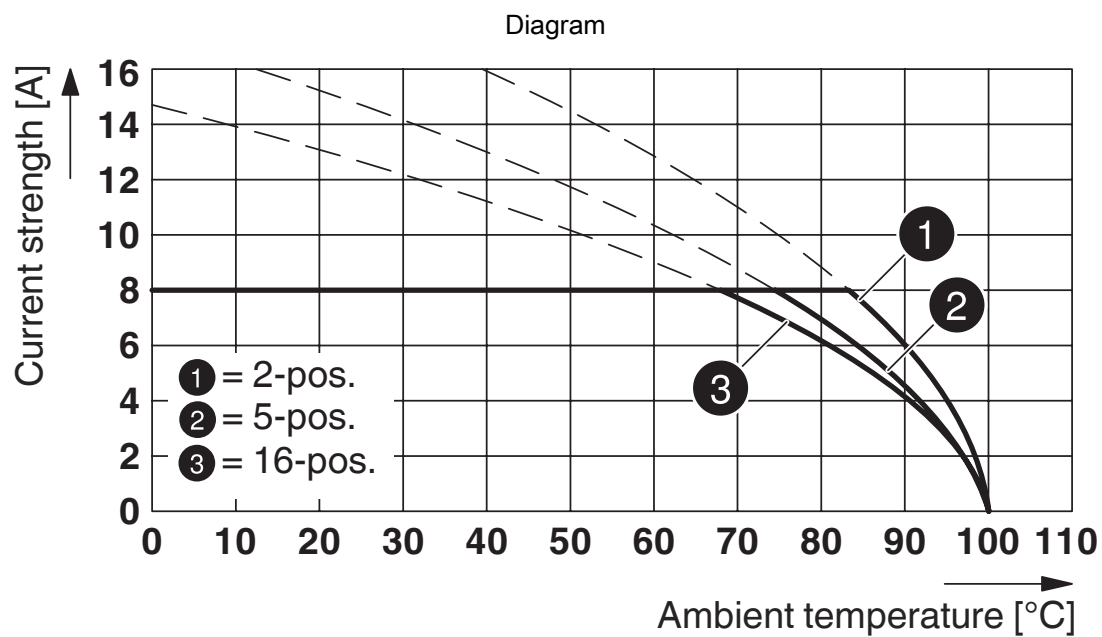
Type: FRONT-MC 1,5/...-STF-3,81 with SMC 1,5/...-GF-3,81

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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 1,5/13-STF-3,81 - PCB connector



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

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1850961>

 <b>CSA</b> Approval ID: 2406780				
	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> 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	-

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## Classifications

### ECLASS

ECLASS-13.0	27460202
ECLASS-15.0	27460202

### ETIM

ETIM 10.0	EC002638
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### UNSPSC

UNSPSC 21.0	39121400
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes, No exemptions
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### 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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