GameChangers

The GameChangers guide

All details about the advantages and technical achievements of our connection technology

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GameChangers
for device connectivity

Some of the top performances are revolutionizing what is conceivable and possible: with innovative ideas, technologies, and materials. Get to know the performance and properties of our products and discover how our GameChangers will also bring your applications to the next level of success.

Simplicity

Flexibility

Speed

Compactness

High Performance

Robustness

SNAP! WOW!
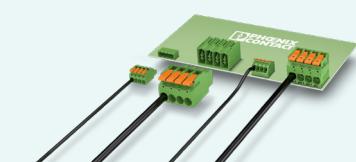
Lever-actuated PCB terminal blocks and connectors

Connecting is a snap

1 Intro

PCB terminal blocks from the LPT series and PCB connectors from the LPC series combine the reliability of the Push-in spring connection with the ease of use of lever actuation, making them the ideal solution for manufacturers who want to offer devices that are particularly easy to use. Operating errors can be eliminated and the wiring effort as well as process and follow-up costs are reduced.
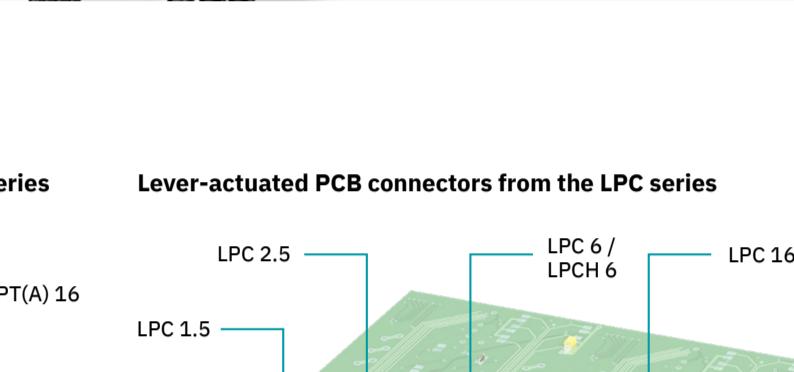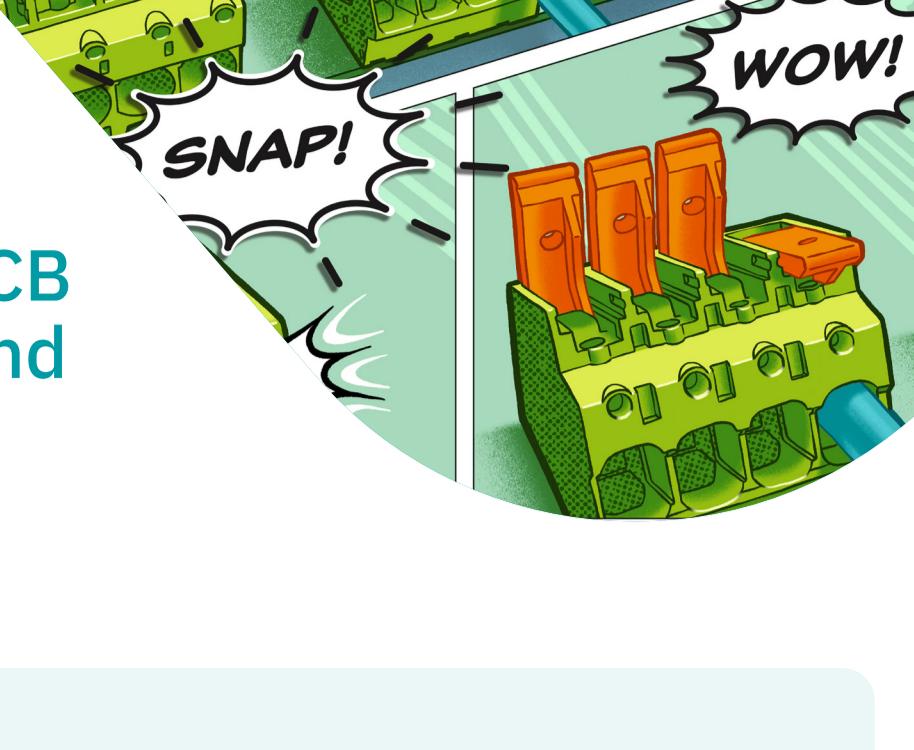
2 Portfolio

Lever-actuated PCB terminal blocks from the LPT series

LPT(A) 6
LPT(A) 16
LPT(A) 2.5

Lever-actuated PCB connectors from the LPC series

LPC 2.5
LPC 6 / LPCH 6
LPC 16 HC
LPC 1.5
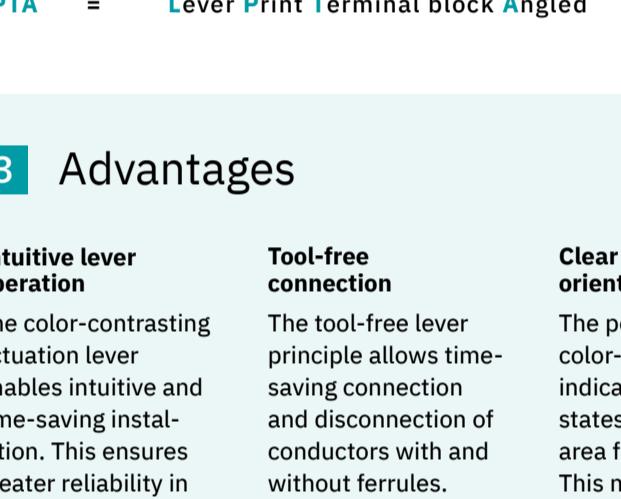
LPT	=	**L**ever **P**rint **T**erminal block
LPTA	=	**L**ever **P**rint **T**erminal block **A**ngled
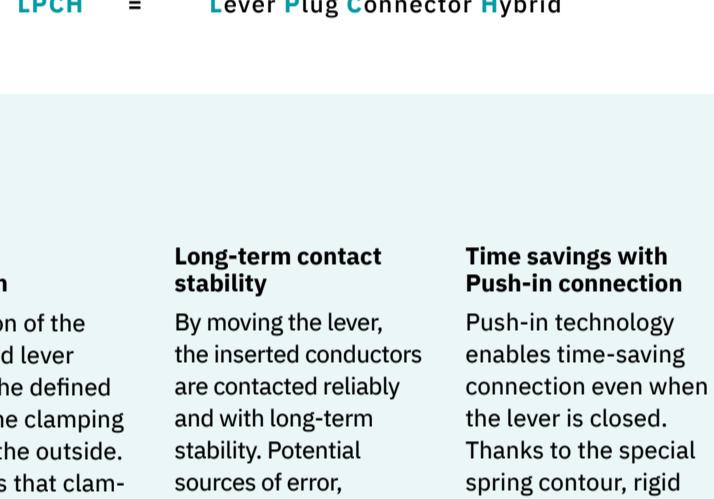
| LPC	=	**L**ever **P**lug **C**onnector
LPCH	=	**L**ever **P**lug **C**onnector **H**ybrid

3 Advantages

Intuitive lever operation
The color-contrasting actuation lever enables intuitive and time-saving installation. This ensures greater reliability in the field and ensures economical operation of the entire system.

Tool-free connection
The tool-free lever principle allows time-saving connection and disconnection of conductors with and without ferrules. The design of the cable entry funnels reliably prevents individual litz wires from splicing.

Clear orientation
The position of the color-coded lever indicates the defined states of the clamping area from the outside. This means that clamping spaces that are not properly closed and therefore faulty connections are immediately apparent.

Long-term contact stability
By moving the lever, the inserted conductors are contacted reliably and with long-term stability. Potential sources of error, such as an incorrect tightening torque for the screw connection, are thus reliably excluded.

Time savings with Push-in connection
Push-in technology enables time-saving connection even when the lever is closed. Thanks to the special spring contour, rigid conductors or conductors fitted with ferrules can be connected easily and conveniently.
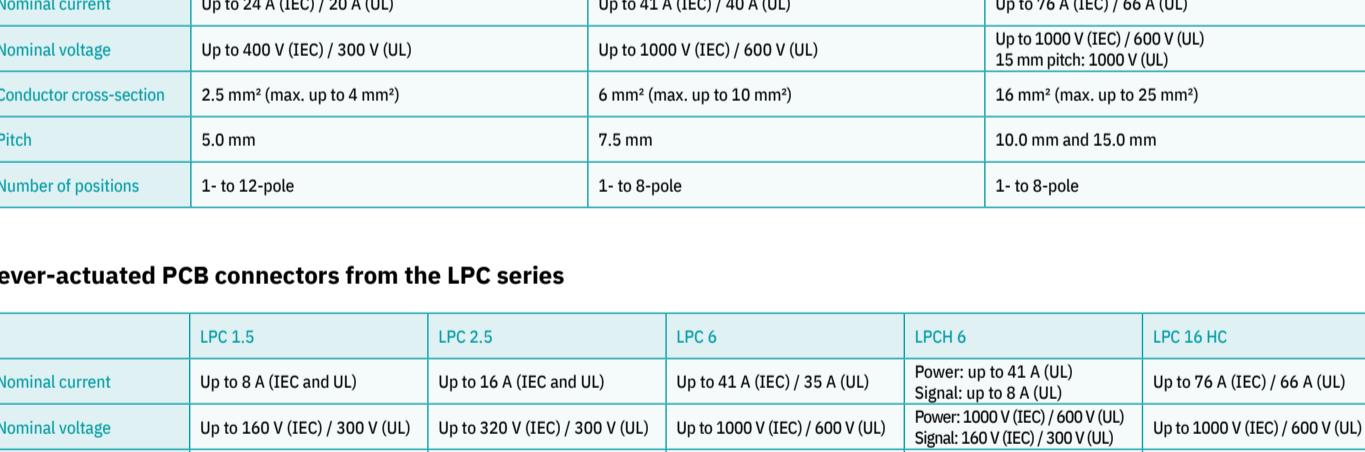
4 Main features

Lever-actuated PCB terminal blocks from the LPT series

	LPT(A) 2.5	LPT(A) 6	LPT(A) 16
Nominal current	Up to 24 A (IEC) / 20 A (UL)	Up to 41 A (IEC) / 40 A (UL)	Up to 76 A (IEC) / 66 A (UL)
Nominal voltage	Up to 400 V (IEC) / 300 V (UL)	Up to 1000 V (IEC) / 600 V (UL)	Up to 1000 V (IEC) / 600 V (UL) 15 mm pitch: 1000 V (UL)
Conductor cross-section	2.5 mm² (max. up to 4 mm²)	6 mm² (max. up to 10 mm²)	16 mm² (max. up to 25 mm²)
Pitch	5.0 mm	7.5 mm	10.0 mm and 15.0 mm
Number of positions	1- to 12-pole	1- to 8-pole	1- to 8-pole

Lever-actuated PCB connectors from the LPC series

	LPC 1.5	LPC 2.5	LPC 6	LPCH 6	LPC 16 HC
Nominal current	Up to 8 A (IEC and UL)	Up to 16 A (IEC and UL)	Up to 41 A (IEC) / 35 A (UL)	Power: up to 41 A (UL) Signal: up to 8 A (UL)	Up to 76 A (IEC) / 66 A (UL)
Nominal voltage	Up to 160 V (IEC) / 300 V (UL)	Up to 320 V (IEC) / 300 V (UL)	Up to 1000 V (IEC) / 600 V (UL)	Power: 1000 V (IEC) / 600 V (UL) Signal: 160 V (IEC) / 300 V (UL)	Up to 1000 V (IEC) / 600 V (UL)
Conductor cross-section	0.14 mm² to 1.5 mm²	0.2 mm² to 2.5 mm²	Up to 10 mm²	Power: up to 10 mm² Signal: up to 1.5 mm²	Up to 25 mm²
Pitch	3.81 mm	5.08 mm	7.62 mm	Power: 7.62 mm Signal: 3.81 mm	10.16 mm
Number of positions	2- to 16-pole	2- to 20-pole	2- to 6-pole (7- to 9-pole on demand)	Power: 2- to 6-pole Signal: 4- or 6-pole	2- to 6-pole (7- to 9-pole on demand)
Locking options	Screw flange or lock-and-release locking system	Screw flange or lock-and-release locking system	Latching flange	Latching flange	Latching flange
Connector system	Compatible with COMBICON MC 1.5	Compatible with COMBICON MSTB 2.5	Compatible with COMBICON PC 6	Compatible with COMBICON PC 6 hybrid	Compatible with COMBICON PC 16 advanced

5 Accessories

Accessories for LPC 6: Shielding plate
- User-friendly shield contacting during plug-in
- Space-saving flange solution
- Easy mounting of the shielding plate on the connector with self-tapping mounting screws
- Main features:
  - Good EMC properties
  - Large-area, low-resistance potential connection
  - Unlimited use up to 1000 V (IEC) or 600 V (UL)

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Webcode to the product list LPC: #3632
Webcode to the product list LPT: #3633

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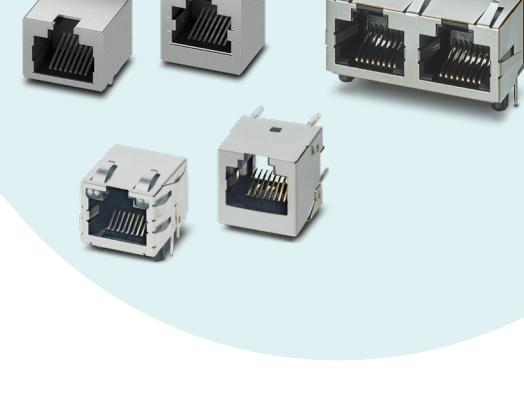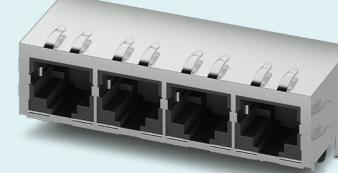
RJ45 PCB connectors

Data connectors for reliable IIoT communication

1 Intro

RJ45 is the standard interface for Ethernet-based communication. The future-proof connection solutions are suitable for various applications in the field of building automation and for Industrial Ethernet applications in harsh industrial environment. With the RJ45 Industrial Connection System Phoenix Contact has developed and established a perfectly coordinated solution between the RJ45 components, which ensures reliable data transmission.

Extended temperature range: down to -50 °C and up to +105 °C

PoE++ (Power over Ethernet)

Data transmission rates up to 10 Gbps
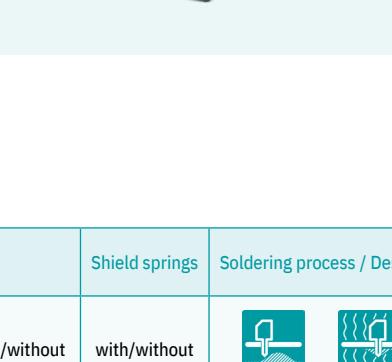
Suitable for demanding industrial applications

2 Portfolio

	Type	Variants	Orientation	Locking clip	LED	Shield springs	Soldering process / Design
RJ45 PCB connectors (Industrial Connection System)	Single-port	16	90° 180°	top	with/without	with/without	WAVE THR
RJ45 PCB connectors	Single-port	14	90° 180°	top/bottom	with/without	without	WAVE THR SMD
	Multi-port	4x4 port 6x2 port	90°	top/bottom	with/without	with	WAVE THR

3 Advantages

RJ45 Single-port/ Multi-port

Perfect fit
For every application the right variant

Available with and without LED, single- and multi-port

Resistant
The extended temperature range of up to -50 °C ... +85 °C enables the use in demanding applications

Robust
THT technology (Through-Hole Technology) ensures high mechanical stability between the socket and the printed circuit board

Reflow-capable
The reflow capability enables an efficient, cost-optimized processing

RJ45 (Industrial Connection System)

Vibration resistant
Ideal for challenging applications due to high shock and vibration resistance (vibration up to 20g, shock up to 50g)

Ideal in combination with suitable Phoenix Contact components (PCB connectors and patch cables)

USP

Resistant
The extended temperature range of -40 °C ... +105 °C enables the use in demanding industrial applications

Shielded
Reliable transmission also in industrial use due to 360° shielding

Housing shield springs enable an optimized EMC shielding concept

Reflow-capable
Automated processing thanks to reflow capability

4 Main features

	RJ45 PCB Jacks	RJ45 PCB Jacks (THR)	RJ45 PCB Jacks (Industrial Connection System)
Transmission speed	Up to 10 Gbps	Up to 10 Gbps	Up to 10 Gbps
Mating cycles	>750	>750	>750
Mounting type	SMT / THT	THR	THT / THR
Soldering process	Wave / Reflow	Reflow	Wave / Reflow
Vibration	Standard 10 Hz - 500 Hz (5g)	Standard 10 Hz - 500 Hz (5g)	Extended 2 Hz - 2000 Hz (20g)*
Shock	-	-	50g/11mms*
Temperature range	-40 °C ... 85 °C	-50 °C ... 85 °C	-40 °C ... 105 °C
LED	monochrome	monochrome	two-tone
MSL (Moisture sensitive Level)	MSL 1 (SMD)	MSL 1	90° MSL 2; 180° MSL 1
Halogen-free	NO	YES	YES
UL approval	c UL us	UL	c UL us

*INDUSTRIAL Connection System with PxC-INDUSTRIAL connector

5 Accessories

Accessories for RJ45 Jack
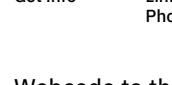
RJ45 connectors
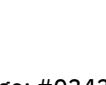
RJ45 INDUSTRIAL connectors

Dust caps for RJ45 Jack

RJ45 patch cables

INDUSTRIAL patch cables

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Webcode to the product list RJ45 connectors single-port/multi-port: #2341
Webcode to the product list RJ45 connectors (Industrial Connection System): #2059

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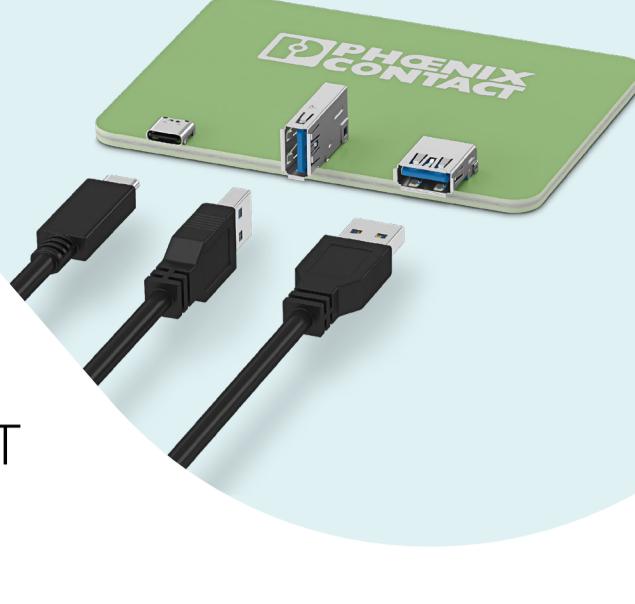
USB PCB connectors

Data connectors for reliable IIoT communication

What to **know:**

1 Intro

USB type A and type C are available in the versions USB 2.0, USB 3.0 and USB 3.2 Gen. 1/USB 3.2 Gen. 2. The data connectors for transmission speeds up to 10 Gbps are ideal for use as a service interface or for permanent transmission in protected industrial applications.
The PCB connectors are available in three outlet directions and enable automated processing for SMD, THR and wave soldering processes.

USB type A
USB type C

Soldering process:
Wave / Reflow

Data transmission
up to 480 Mbps,
5 Gbps, 10 Gbps
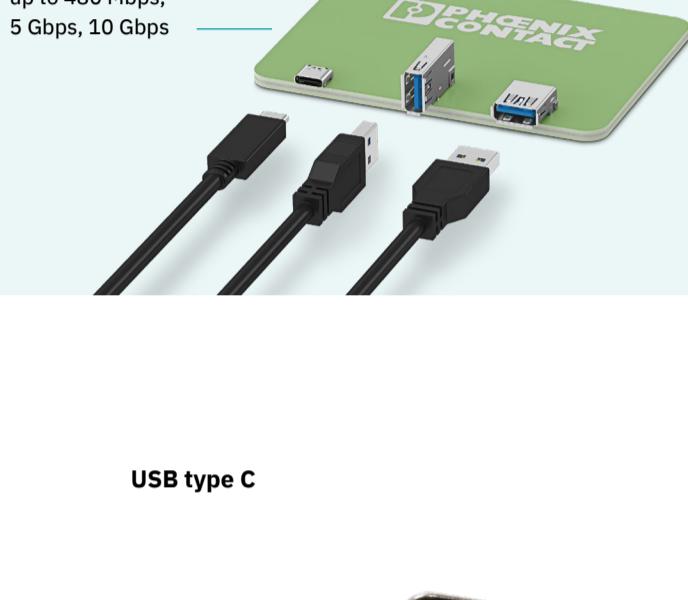
2 Product portfolio

USB type A
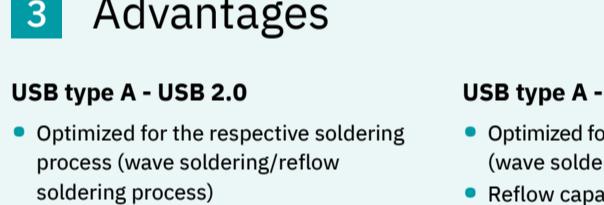
90° horizontal | 180° vertical | 90° vertical

USB type C
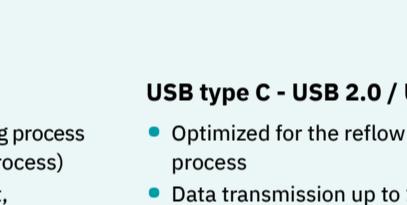
90° horizontal | 180° vertical

3 Advantages

USB type A - USB 2.0
- Optimized for the respective soldering process (wave soldering/reflow soldering process)
- Data transmission up to 480 Mbps
- Comfortable tray packing
- Can be processed automatically thanks to tape-on-reel packaging

USB type A - USB 3.2 Gen. 1
- Optimized for the respective soldering process (wave soldering/reflow soldering process)
- Reflow capability allows an efficient, cost-optimized manufacturing process
- Data transmission up to 5 Gbps
- Comfortable tray packing
- Can be processed automatically thanks to tape-on-reel packaging
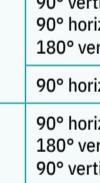
USB type C - USB 2.0 / USB 3.2 Gen. 2
- Optimized for the reflow soldering process
- Data transmission up to 10 Gbps
- Can be processed automatically thanks to tape-on-reel packaging
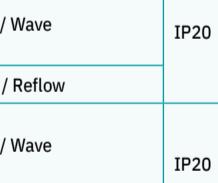
4 Main features

USB PCB connectors

Type		Version	Number of positions	Orientation	Mounting type / Soldering process	Degree of protection
USB type A		USB 2.0	4	90° vertical 90° horizontal 180° vertical	THT / Wave	IP20
				90° horizontal	SMT / Reflow	
		USB 3.2 Gen. 1	9	90° horizontal 180° vertical 90° vertical	THT / Wave	IP20
				180° vertical	THR / Reflow	
USB type C		USB 2.0	16	90° horizontal	SMT / Reflow	IP20
		USB 3.2 Gen. 2	24	180° vertical	SMT / Reflow	IP20
				90° horizontal	SMT-THR / Reflow	

5 Accessories

USB patch cable

- Different combination options:
  - USB type A and type C connectors
  - USB 2.0 / USB 3.2 Gen. 1 / USB 3.2 Gen. 2 versions
- Various cable lengths
- Sheath material: PVC

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Coaxial cables and PCB connectors

Data connectors for reliable IIoT communication

1 Intro
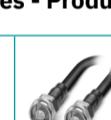
The pre-assembled coaxial cables and coaxial PCB connectors are the perfect choice for transmitting WLAN, Bluetooth, LTE or 5G signals. The cables with the N, SMA and R-SMA series connectors can be used for frequencies up to 7.25 GHz and have excellent damping properties. The use of materials with a lead content of 0.1 % or less ensures future-proof use. Thanks to the UV-resistant LZHS cable, it can be used in almost all industrial field communication applications.

Ideal for the industrial sector

Reliable communication

Future-proof and sustainable
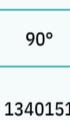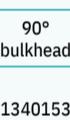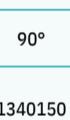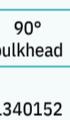
2 Portfolio and main features
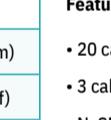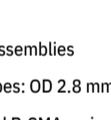
Overview of connector types

	N	SMA	R-SMA
Male			
Female			

Coaxial PCB connectors - Product portfolio incl. item numbers at a glance

					Features
Soldering process	Wave/THR	Wave	Wave/THR	Wave	• 4 PCB connectors
Series	SMA	SMA	R-SMA	R-SMA	• SMA series: THR and bulkhead
Alignment	90°	90° bulkhead	90°	90° bulkhead	• R-SMA series: THR and bulkhead • Frequency range: DC-12.4 GHz • Lead-free (≤0.1 % Pb)
Item no.	1340151	1340153	1340150	1340152	→ RoHS-compliant without exception

Assembled coaxial cables - Product portfolio incl. item numbers at a glance

							Features
Coax type head 1	N (m)	N (f) BH	N (m)	N (f) BH	N (m)	SMA (m)	• 20 cable assemblies
Coax type head 2	N (m)	R-SMA (m)	R-SMA (m)	SMA (m)	SMA (m)	SMA (f)	• 3 cable types: OD 2.8 mm; 4.9 mm; 10.3 mm
Cable length 0.5 m	1340122	1340129	1340130	1340138	1340139		• N, SMA and R-SMA series connectors
1.0 m			1340131		1340143		• Length: From 0.5 m up to 30 m
1.5 m			1340133				• Connectors and cables lead-free (≤0.1 % Pb)
2.0 m			1340135				→ RoHS-compliant without exception
3.0 m	1340123		1340136		1340144		• UV-resistant LSZH cable
5.0 m	1340124		1340137		1340147	1340149	• Outdoor cable degree of protection: IP67
10 m	1340125					1340148	• Frequency range: up to 7.25 GHz
15 m	1340126						• Excellent damping properties
30 m	1340127						• Cable operating temperature: -40 °C ... +85 °C

3 Advantages

High frequency range (USP)
The frequency range of the pre-fabricated coaxial cables of up to 7.25 GHz enables the use of the high Wifi6 and 5G frequency bands

Cost-optimized manufacturing process
The THR and reflow capability allows an efficient and cost-optimized manufacturing process

Wide range of applications
Different areas of application such as WLAN, Bluetooth, LTE or 5G are covered

Reliable communication
Developed for industrial requirements: longterm stability for reliable communication

Leadfree products (USP)
RoHS conformity without exception: use of of lead-free materials (lead content ≤0.1%) is considered as future-proof and sustainable

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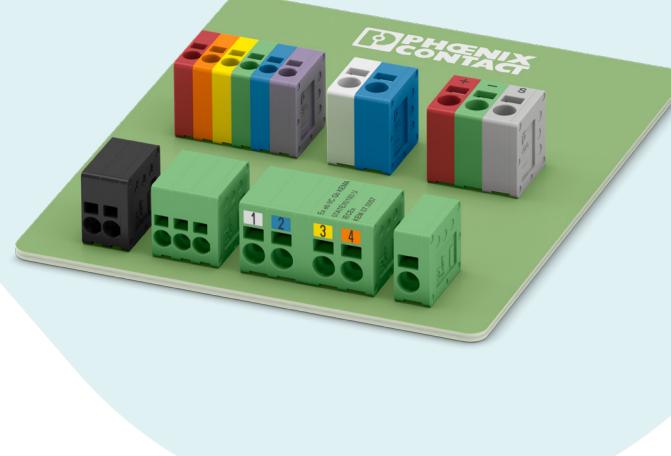
PCB terminal blocks of the SPT 1.5 and 2.5 series

Front-operated PCB terminal blocks with Push-in spring connection technology

1 Intro

Versatile PCB terminal blocks - 24 to 1,500 volts in one connection block

PCB terminal blocks from the SPT 1.5 and SPT 2.5 series serve as the ideal interface for transmitting data, signals and power. Available in horizontal and vertical connection directions, they integrate into any device front and also allow a large number of terminal points with high packing density. Spacers for higher voltages and a large selection of housing colors leave almost nothing to be desired for the device designer.

Time saving push-in connection, tools not required

Operation and conductor connection from one direction enable the integration into the device front

Two solder pins reduce the mechanical strain on the soldering spots

Defined contact force ensures that contact remains stable over the long term
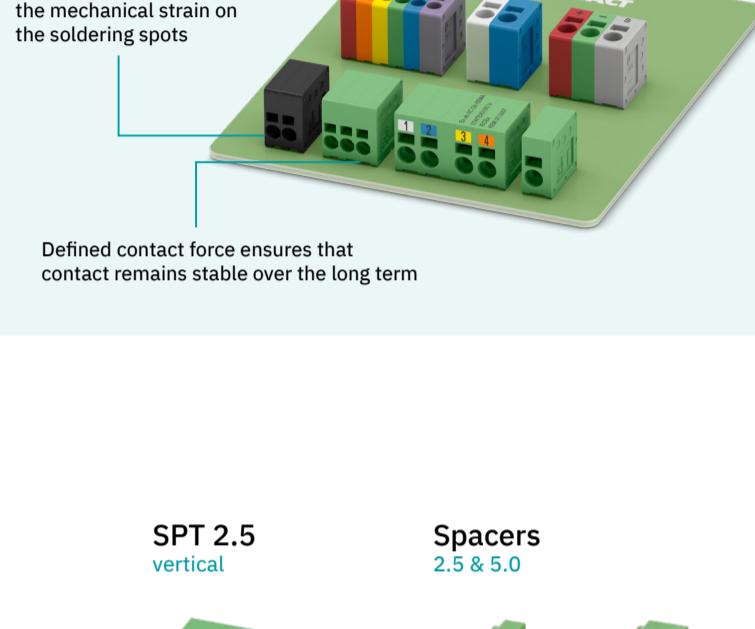
2 Portfolio
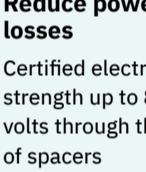
| SPT 1.5 horizontal | SPT 1.5 vertical | SPT 2.5 horizontal | SPT 2.5 vertical | Spacers 2.5 & 5.0 |
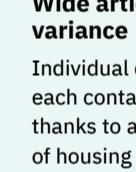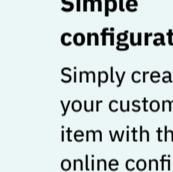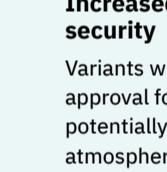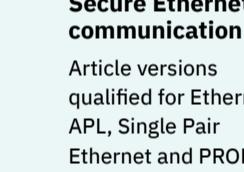
3 Advantages

Reduce power losses
Certified electric strength up to 800 volts through the use of spacers

Wide article variance
Individual design of each contact point thanks to a variety of housing colors and customerspecific printing
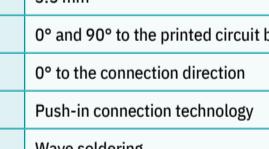
Simple configuration
Simply create your customized item with the online configurator
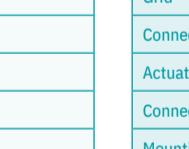
Increased security
Variants with EX approval for use in potentially explosive atmospheres available
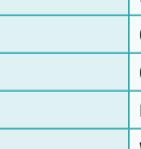
Secure Ethernet communication
Article versions qualified for Ethernet APL, Single Pair Ethernet and PROFINET
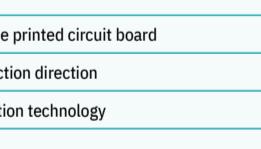
4 Main features

SPT 1.5

Product type	PCB terminal block
Current	17.5 A (IEC) / 10 A (UL)
Voltage	200 V (IEC) / 300 V (UL)
Cross section	1.5 mm² / AWG 16
Grid	3.5 mm
Connection direction	0° and 90° to the printed circuit board
Actuating direction	0° to the connection direction
Connection method	Push-in connection technology
Mounting type	Wave soldering
Solder pin	2.5 mm
Packaging	Cardboard packaging (assorted)

SPT 2.5

Product type	PCB terminal block
Current	24 A (IEC) / 20 A (UL)
Voltage	400 V (IEC) / 300 V (UL)
Cross section	2.5 mm² / AWG 12
Grid	5.0 mm
Connection direction	0° and 90° to the printed circuit board
Actuating direction	0° to the connection direction
Connection method	Push-in connection technology
Mounting type	Wave soldering
Solder pin	2.5 mm
Packaging	Cardboard packaging (assorted)

5 Accessories

Screwdriver

For SPT 1.5   For SPT 2.5

Crimping pliers

Shield connection for data transmission

Shield connection terminal block   Shield connection clamp

Spacers

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Displays and keypads for electronics housings

Individual display and operating solutions

1 Intro

The electronics housings in the BC, ICS, ME-IO and UCS series are now available with integrated touch displays or displays with configurable membrane keypads. Configure your individual electronics housings solution and we will take care of everything else - from printing and mechanical processing through to the final assembly.

Modular housings ICS and multifunctional housings ME-IO with modular front connection technology

Universal housing UCS for embedded systems

Building installation housing BC
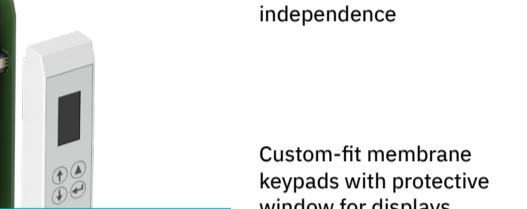
2 System structure

Coordinated housing systems for display and operating applications
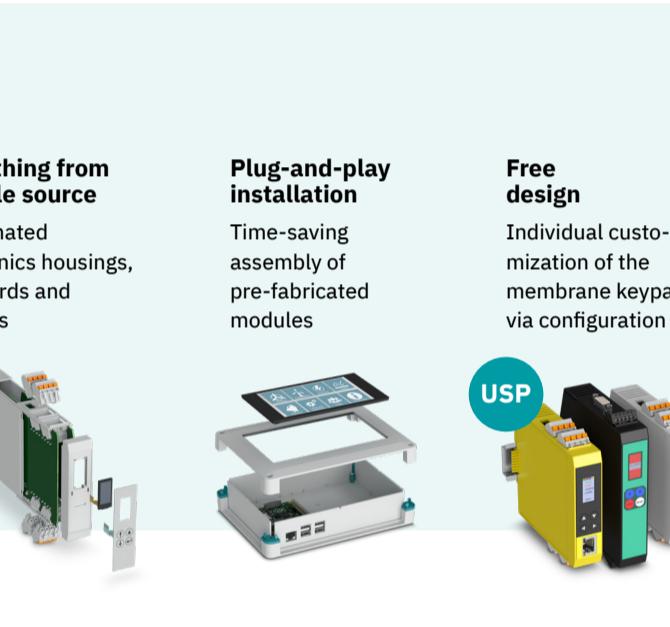
TFT displays with IPS panel for viewing angle independence

High-resolution touch displays pre-integrated into the top of the housing share

Custom-fit membrane keypads with protective window for displays

3 Advantages

Centralized or decentralized
Housing systems for visualization and operation, in the control cabinet or field

Everything from a single source
Coordinated electronics housings, keyboards and displays

Plug-and-play installation
Time-saving assembly of pre-fabricated modules

Free design
Individual customization of the membrane keypad via configuration

Simple design-in
Positioning of the display via configurator
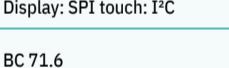
4 Main features

Displays for electronics housings

Displays				
Item no.	1215685	1132710	2203537 [1]	1342719
Color	on request without ICS cover		light gray (RAL7035)	
Type	ICS25-C122X12-DKP-7035	DCT T 2.4 QVGA S RTOUCH	DFC T 2.4 QVGA S 7035	DCT T 2.4 QVGA RI CTOUCH
Diagonal	0.96"	2.4"	2.4"	2.4"
Resolution	160 x 80	320 x 240	320 x 240	320 x 240
Technology	TFT, IPS panel	TFT, resistive touch	TFT	TFT, capacitive touch
Interface	SPI	SPI	SPI	Display: SPI touch: I²C
Recommended housing application	ICS25	ICS50 ME-IO 56.2 UCS	ME-IO 75.2 ME 67.5 OT ME 90 OT MEMAX 90	BC 71.6 BC 107.6 BC 161.6
Operating temperature range [°C]	-20 … +70	-20 … +70	-20 … +70	-20 … +70
Dimensions of the mounting plate	Width [mm]	13.5	74.4	71.5	66
	Depth [mm]	1.5	7	7.8	10
	Height [mm]	27.95	47.4	59.2	45
Brightness [cd / m²]	400	180	220	425

1) Item available with other frame colors: 2203539, blue (RAL 5015) and 2203538, yellow (RAL 1018)

Membrane keypads for electronics housings

Displays					
Item no.	1337341	1337344	2203574	1215683	1215684
Type	KP BC K4 C2 P5	KP BC K6 C2 P5	KP HC-ALU 100 K4 C4 P6	KP ICS 25X100 K4 C3 P5	KP ICS 25X122 K4 C3 P5
Number of buttons/colors	4 buttons, 2 colors	6 buttons, 2 colors	4 buttons, 4 colors	4 buttons, 3 colors, TFT output section 1"	4 buttons, 3 colors, TFT output section 1"
Dimensions	Width [mm]	28	28	95	22.2	22.6
	Height [mm]	42	42	72	80.7	103.2
Grid foil cable [mm]	1.0	1.0	1.0	1.0	1.0
Length of foil cable [mm]	80	80	47.3	13.1	13.1
Recommended housing application	BC 107.6 BC 161.6	BC 107.6 BC 161.6	UM-ALU HC-ALU	ICS25X100	ICS25X122
Connection	7-pole	7-pole	6-pole	5-pole	5-pole

Configurator for membrane keypads of the ICS, BC and HCS series

Configure your individual membrane keypad for your unique design with the ICS modular housings system.

1. Customize your electronics housing online with the configurator to suit your application together.

2. Select the ICS25 housing or the BC housing.

3. Configure the shapes, colors and lettering of the keys on your membrane keypad.

4. If required, take advantage of the offer of individual advice for the processing of Phoenix Contact.

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PCB terminal blocks & connectors for Single Pair Ethernet

Continuous data transmission finally goes the distance

1 Intro

Use compact device and cable connectors from the ONEPAIR series for Single Pair Ethernet (SPE). The standardized SPE interfaces are ideal for efficient data transmission in factory, process and building automation. The application-specific cabling forms the basis for futureproof Ethernet communication from the field to the cloud.

Use tested SPE PCB terminal blocks with proven screw and push-in connection technology. The terminal blocks are characterized by a clear color coding, which is based on the wires of the SPE cable.

ONEPAIR

M8 M12 M12 HYBRID IP20

COMBICON
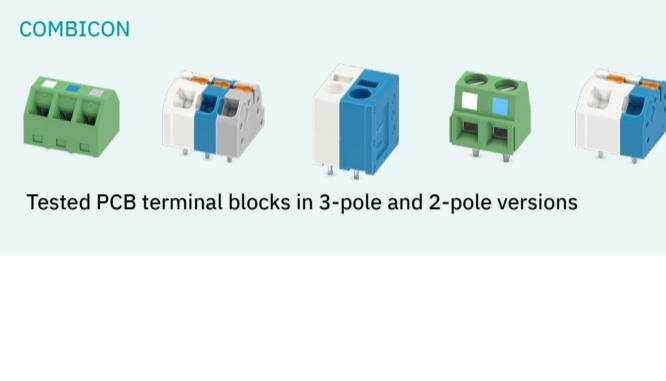
Tested PCB terminal blocks in 3-pole and 2-pole versions

2 System structure

Compact device and cable connectors for Single Pair Ethernet

WINNER BEST OF INDUSTRY AWARD
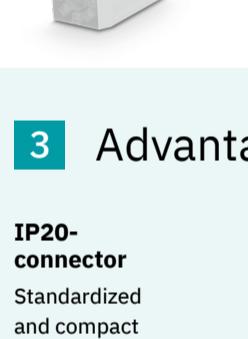
Standardized SPE interfaces for secure data transmission according to IEEE standards

SPE PCB terminal blocks from the COMBICON portfolio

3 Advantages

IP20-connector
Standardized and compact connectors and cables according to IEC 63171-2.

M8- and M12-connectors
Robust and protected connector in industry standard M8 and M12 according to IEC 63171-5

M12 hybrid connector
Combined data transmission in size M12 according to IEC 63171-7.

Compact
Miniaturized connectors allow a high packing density and compact communication devices for the IIoT.

Cross-application
Ranges up to 1,000 m, data rates up to 1 GBit/s and power up to 50 W (with PoDL).

Intuitive handling
Intuitive handling thanks to clear color coding ensure a quick and easy integration of field devices.

USP USP USP

4 Main features

Connectors for SPE of the ONEPAIR series

IEC standard	IEC 63171-2, IEC 63171-5, IEC 63171-7
Distance	Up to 1,000 m (with SPE Standard 10BASE-T1L)
Data rate	Up to 1 GBit/s (with SPE Standard 1000BASE-T1)
Power	Up to 50 W (with PoDL) and 1 kW (Hybrid)
Interface	IP20, M8, M12 and M12 hybrid
Cabling	Twisted pair (shielded)
Degree of protection	IP20, IP65/67

SPE PCB terminal blocks from the COMBICON portfolio

Connection technology	Screw and Push-in connection technology
Distance	Up to 1,000 m
Data rate	Up to 10 Mbps
Power	Suitable for Power-over-Data-Line applications
Cross section	0.14 mm² to 2.5 mm² (26 AWG to 12 AWG)
Connection directions	0°, 45° and 90°
Pitch	3.5 mm to 5.08 mm
Degree of protection	IP20

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CONNEXIS

Wire-to-board connectors for assemblies

When speed an precision means everything
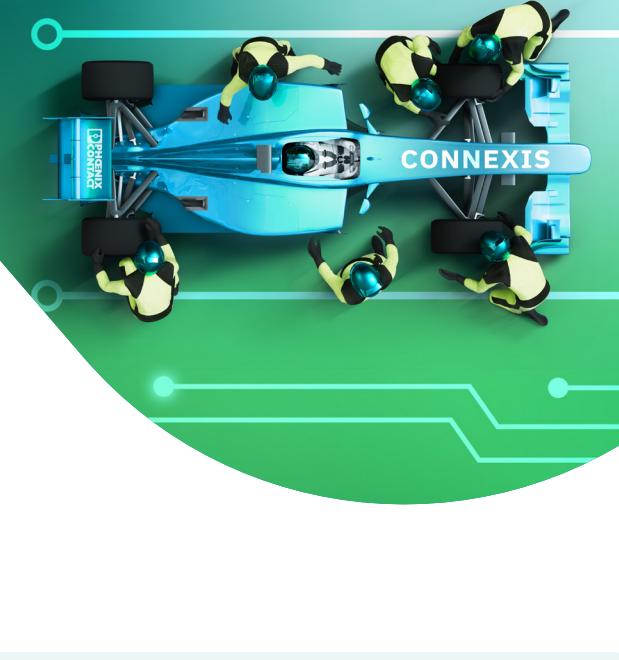
1 Intro

Wire-to-board connectors for cable assemblies with Push-in and crimp connection include connectors and headers with horizontal or vertical connection direction as well as panel feed-throughs. The crimp contacts are available for AWG 28 ... 14 conductors. With pitches of 2.5 mm, 3.81 mm, and 5.08 mm, the connectors from the D21, D31, and D32 series of the CONNEXIS range are suitable for numerous signal and low-voltage supplies.

D21
CONNEXIS connector series D21 with 2.50 mm pitch

Wire-to-board connector with crimp connection for cable assemblies
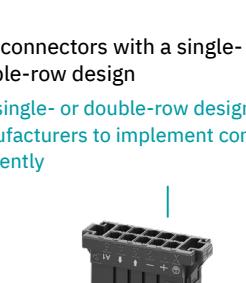
D31
CONNEXIS connector series D31 and DD31PS with 3.81 mm pitch

Wire-to-board connectors for cable assemblies with crimp and Push-in connection
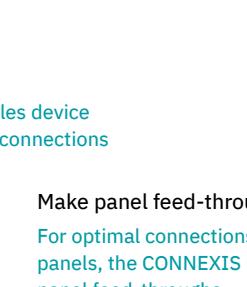
D32
CONNEXIS connector series D32 with 5.08 mm pitch

Wire-to-board connector with crimp connection for cable assemblies

2 System structure

PCB connectors with a single- or double-row design
The single- or double-row design enables device manufacturers to implement compact connections efficiently

Realize flying connections
With the flying versions of the CONNEXIS range, you can make wire-to-wire connections

Make panel feed-throughs
For optimal connections through housing panels, the CONNEXIS range also contains panel feed-throughs

Crimping tools
Informations for commercially commercially available crimping tools are on request from Phoenix Contact or in the download area

Headers in various designs
Headers with a horizontal or vertical design enable you to design PCBs efficiently.

PCB connectors with crimp connection
PCB connectors with crimp connection are optimized for automated production.

3 Advantages

Fast, tool-free installation
in the field with Push-in connection technology

Error-free connection
due to versions with mechanical keying

Effortless compatibility
during the last steps in the field with a mating face in the established market standard

Quick and safe assembly
due to custom number, letter, and symbol printing

Easy and time-saving production
with pre-assembled connectors

Design-in support
during device development through M-CAD/ E-CAD data and a free sample service

4 Main features

	D21	D31	DD31PS	D32
Connection technology	Crimp connection	Crimp connection (D31)	Push-in connection (DD31PS)	Crimp connection
Number of positions	6-20	2 ... 20 (D31)	4 ... 20 (DD31PS)	2-20
Pitch	2.50 mm	3.81 mm	5.08 mm
Current	5 A	8 A	8 A
Voltage (III/2)	160 V	160 V	320 V

5 Accessories

For CONNEXIS wire-to-board connectors

Crimping tool for disassembly (D31/D32)

Crimping tool for disassembly (DD21)

Easily release crimp contacts

6 Learn more
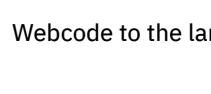
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PHŒNIX CONTACT

PCB connector SPC 4

The best combined in one plug

1   Intro

The new SPC 4 series PCB connectors are extremely compact. A pitch of only 6.35 mm helps save space on the device front and provides device manufacturers with new design options. Nevertheless, the connectors can accommodate conductors of up to 4 mm² due to their innovative design. This is made possible by the Push-in connection.

The SPC 4 series connectors from Phoenix Contact come in three designs: In addition to the standard version without connector and header locking, there is a variant with top lock and one with middle flange. Those locking elements have a

different color and can be intuitively operated. More advantages of the new PCB connectors include an innovative shield connection on the printed circuit board; also, they are safe to touch at either end. The THR header with optional tape-on-reel packaging facilitates integration into the SMT soldering process.

2   System structure

PCB connector

| Standard | Top lock | Middle flange | Middle flange and shielding |

Headers

| Horizontal | Horizontal 180° rotated | Vertical |
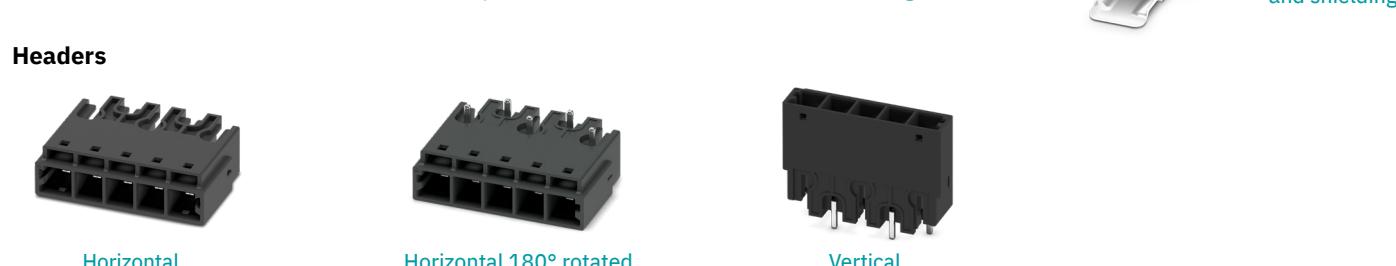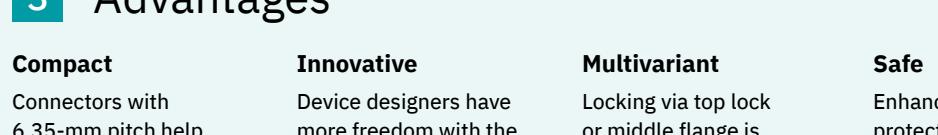
3   Advantages

Compact
Connectors with 6.35-mm pitch help save space on the device front.

Innovative
Device designers have more freedom with the clever shield contacting mechanism.

Multivariant
Locking via top lock or middle flange is reliable and space-saving.

Safe
Enhanced touch protection on header and connector offers extra safety.

Efficient
The THR headers help reduce production costs thanks to suitability for reflow soldering and automated assembly.

-15%

4   Main features

Pitch	6.35 mm	2 to 12-pole	✓
Conductor crosssections	0.25 mm² to 4 mm² with ferrule incl. insulating collar	Extended touch protection in accordance with IEC/UL 61800-5-1	✓
Currents	up to 24 A (IEC) and 22 A (UL)	Plug optionally with top lock or center latching flange	✓
Voltages up to	Plug: 1000 V IEC (III/3), 600 V UL (use group C)	THR headers optionally in tape-on-reel packaging	✓
	Header: 630 V IEC (III/3), 600 V UL (use group F)		

5   Accessories

The SPC connector is coded on the side of the mating face.
Coding profile 1303676 / CP-PC-N THR GY7042 is available for the headers.
The opposite lug on the plug can be cut off by the customer.

Coding element

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FINEPITCH-FP 0,8 series board-to-board connectors

Shielded and unshielded solutions with 0.8 mm pitch

1 Intro

The double-sided ScaleX contact system of the FP 0,8 series allows particularly robust PCB connections. High-speed data rates of up to 52 Gbps are achieved. The shielded versions are optimized for very good electromagnetic compatibility (EMC). Furthermore there are two unshielded versions available. One with AOI-capable signal contacts and one with a PCB footprint compatible with the shielded version. This results in a unique, flexible portfolio with mezzanine, orthogonal and coplanar PCB arrangements.

2 Application

Robustness and tolerance compensation

The ScaleX contact system enables a housing geometry, in which the contacts are protected from damage in the event of mismating. Reliable mating is guaranteed even with a center offset of ±0.7 mm and an angular deviation of ±5°. When mated, a longitudinal and transverse position deviation of ±0.3 mm and an angular deviation of ±5° are possible. Together with the wiping tolerance of 1.5 mm, the FP 0,8 series offers high flexibility in PCB design. The system can be used, for example, for tolerance compensation within the entire process chain and for the multiple connection of two printed circuit boards.

Inclination tolerance during mating insertion

Center offset during mating

Inclination tolerance in the mated condition

Compensation of the position tolerance in mated condition

Properties

- Robust plugging with high tolerance compensation
- Optional shielded version
- Two different footprints: AOI-capable and space-saving contacts
- Process reliability for soldering coplanarity of ≤0.10 mm

≤ 52 Gbps

- Secure setting with positioning pin
- Simple plugging: Polarization prevents mismating plugging
- Pole 1 marked in plastic housing
- Board locks for a robust connection

3 Advantages

Robust plugging with high tolerance compensation
Housing geometry and hermaphroditic double contact ensure compensation for plug-in and conductor plate tolerances.

High data rate
The FP 0,8 series offers signal integrity with data rates up to 52 Gbps.

Reliably connected
The double contact enables a variable wipe length of 1.5 mm and an additional contact overlap of 0.8 mm as safety.

Flexible device design
Stack heights from 6 to 21 mm allow a great deal of freedom for the device design.

Multiple connections
Thanks to the high flexibility and tolerance compensation, it is possible to connect printed circuit boards with several connectors at the same time.

4 Main features

Pitch	0.8 mm
Number of positions	12 … 80
Stack heights	6 mm … 21 mm
Designs	Vertical and horizontal
Shielding	Optional

Floating	± 0.3 mm (x- and y-direction), contact-integrated
Nominal current per contact	1.7 A
Data rate	Up to 52 Gbps
Mating cycles	500

5 Special features

The FP 0,8-SL and FP 0,8-SH product variants are special within the FP 0,8 portfolio. Both are solderable on the PCB footprint of the FP 0,8-SH variant. If FP 0,8-SL is used on the footprint of FP 0,8-SH, the solder pads of the shield connection are not used.
The footprint compatibility of the two variants allows switching between shielded and unshielded FP 0,8 variants without changing the PCB layout. This ensures maximum flexibility and cost-effectiveness in device development.

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FINEPITCH-FR 1,27 series board-to-board connectors

High-speed data transmission with a pitch of 1.27mm

1 Intro

High-speed data transmission and time savings in the development process make a real difference: With the FR series board-to-board connectors with a pitch of 1.27 mm, Phoenix Contact provides data rates of up to 28 Gbps and customer-specific simulations for data integrity.
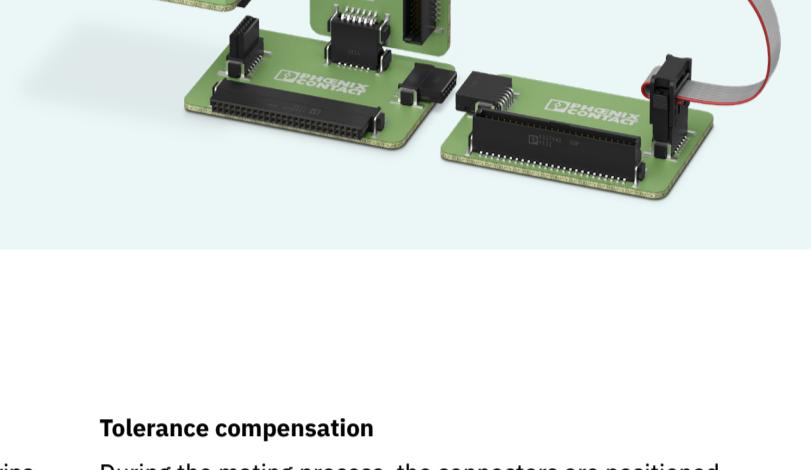
2 Application

Stack heights

With vertical versions of the female and male connector strips the printed circuit boards can be securely connected. Thanks to their wipe length of 1.5 mm, the printed circuit board connectors are suitable for stack heights between 8 and 13.8 mm without gaps.
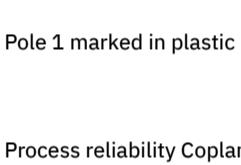
Tolerance compensation

During the mating process, the connectors are positioned with a position tolerance of ±0.7 mm in the longitudinal and transverse directions. The geometry also allows an inclination tolerance of ±5 ° when plugging together.

Center offset during mating

Inclination tolerance during insertion

Properties

Robust housing for secure insertion

Pole 1 marked in plastic housing

Process reliability Coplanarity of soldering ≤0.10 mm (6- to 80-pole)

≤ 28 Gbps

Secure insertion with positioning pin

Easy plugging: polarization prevents 180° twisted plugging

Contacts visible and suitable for AOI

Board locks for a robust connection

3 Advantages

High-speed data
The first high-speed data transmission with up to 28 Gbps in the established market standard offers new design-in possibilities.

Quality in detail
Gold-plated contact areas enable long-term stable signal transmission and currents of up to 2.3 A.
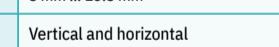
Variety
Robust 6-pos. to 100-pos. board-to-board and wire-to-board connectors provide greater flexibility in component selection.

Compatibility
Compatibility with established competitors is given.

Variance
In addition to the standard items, customized versions are available on request.

USP ≤ 28 Gbps

USP

4 Main features

FINEPITCH FR 1,27 Board-to-Board

Pitch	1.27 mm
Number of positions	6 … 100
Stack heights	8 mm … 13.8 mm
Design	Vertical and horizontal
Nominal current per contact	2.3 A
Mating cycles	500
Data rate	Up to 28 Gbps

FINEPITCH FR 1,27 Wire-to-board

Pitch	1.27 mm
Number of positions	12 … 80
Cable length	5 cm … 95 cm
Design	IDC female connector / flat ribbon cable
Nominal current per contact	1.2 A
Mating cycles	500

5 Accessories

Optionally, strain relief can be attached to the prefabricated IDC female connector.

6 Learn more

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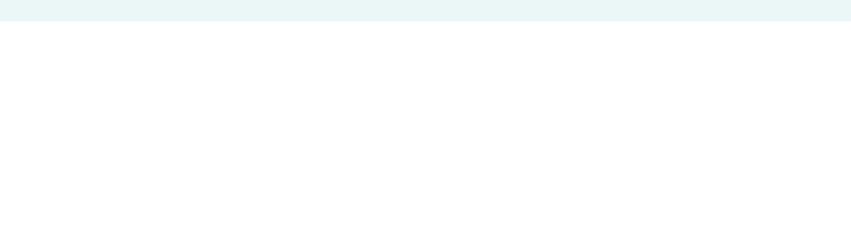
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FINEPITCH-FS 0,635 series board-to-board connectors

High-speed data transmission with a pitch of 0.635 mm
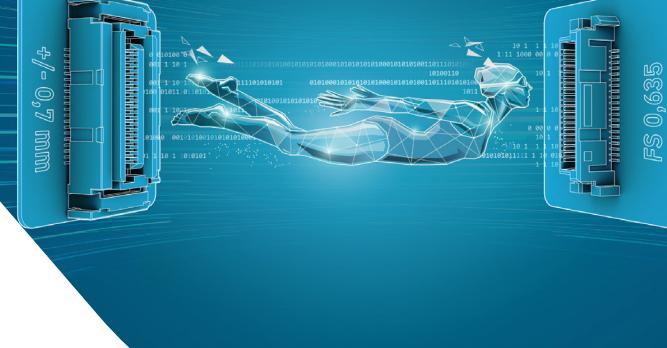
1 Intro

FS 0,635 series board-to-board connectors are a space-saving option for mezzanine PCB arrangements, enabling high-speed data transmission rates of up to 40 Gbps. With different numbers of positions and stack heights, they offer a wide range of options for device designs.

2 Application

Stack heights

With the FS 0,635 series female and male connector strips, various stack heights ranging from 6.0 to 16.6 mm can be realized. The stack height describes the distance of two printed circuit boards lying parallel on top of each other. A height tolerance of 0.6 mm is permitted for the stack heights.
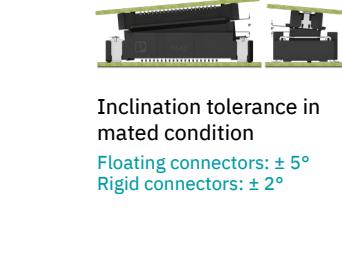
Tolerance compensation

Center offset during mating
Floating connectors: ± 0.7 mm
Rigid connectors: ± 0.5 mm

Compensation of the position tolerance in the mated state
Floating connectors: ± 0.7
Rigid connectors: n/a

Inclination tolerance during mating
Floating connectors: ± 10°
Rigid connectors: ± 10°

Inclination tolerance in mated condition
Floating connectors: ± 5°
Rigid connectors: ± 2°

Properties

Easy mating with high tolerance compensation

Pole 1 marked in plastic housing

Contacts visible and suitable for AOI

Process reliability for soldering coplanarity of ≤0.12 mm

Safe setting with positioning pin

Floating (optional) for high tolerance compensation

Easy plugging: polarization prevents 180° twisted plugging

Board-locks for a robust connection

≤ 40 Gbps

3 Advantages

Comprehensive portfolio in all stack heights
Four different numbers of positions per stack height.

FS 0,635 Floating
The floating principle ensures a tolerance compensation of ± 0.7 mm in x- and y-direction and 0.6 mm in z-direction.

Robustness
Female connector strips with floating functionality increase the robustness of the connector against shock and vibration.

Data rates
High-speed data transmission up to 40 Gbps for a wide range of applications.

Easy mating
Integrated keyways and tolerance compensation ensure error-free production.
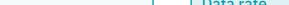
4 Main features

	Floating connectors	Rigid connectors
Pitch	0.635	0.635
Contact type	single-beam	single-beam
Number of positions	20 … 80	20 … 80
Stack heights	8 mm … 12.6 mm	6 mm … 16.6 mm
Designs	Vertical	Vertical

	Floating connectors	Rigid connectors
Floating (x- and y-direction)	+/- 0.7 mm	-
Nominal current per contact	0.5 A	0.5 A
Data rate	40 Gbps	30 Gbps
Mating cycles	50	50

5 Special features

Floating
In contrast to a rigid board-to-board connection, a combination with FS 0,635 Floating can cause misalignments of ± 0.7 mm in x and y directions. This capability is realized by an appropriately designed contact and a twopart housing. The floating feature compensates for design tolerances and mechanical movement caused by vibration or thermal effects. Influences on the solder joints are minimized by the spring effect of the contacts.
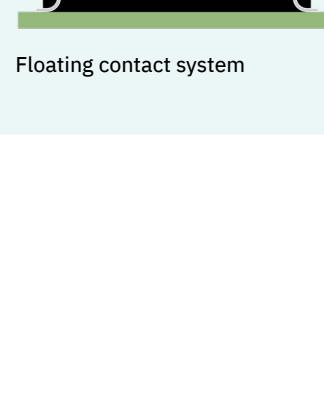
Floating contact system

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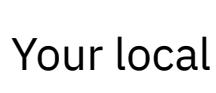
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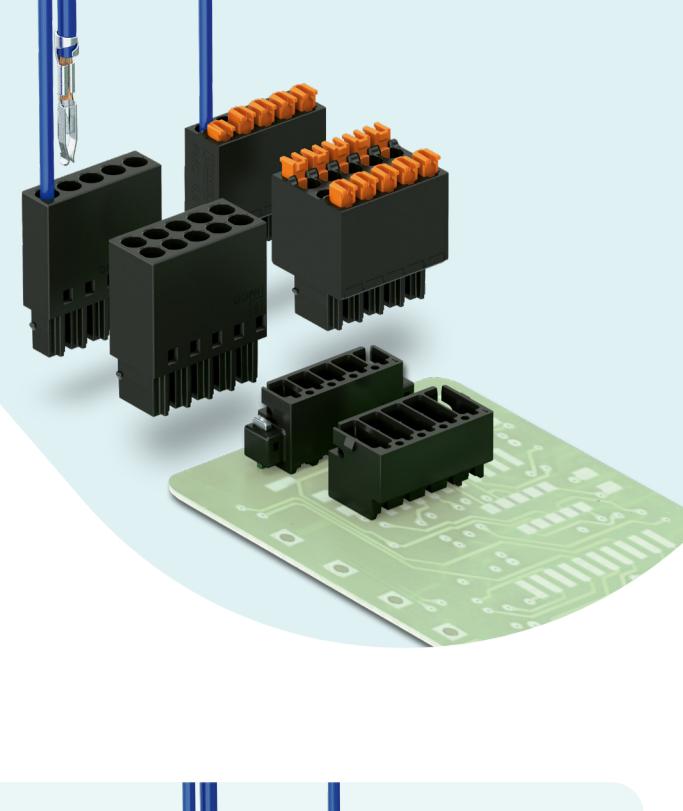
PCB Connectors of the Series D/MCC 0.5

In 2.54 mm pitch with push-in or crimp connection

1 Intro

Phoenix Contact offers plug-compatible PCB connectors with crimp technology for the cost-effective connection of crimped conductors in large quantities. These connectors also have gold-plated contact points, which ensure longterm stable transmission quality. Thanks to the double-row arrangement of the contacts high packing density is achieved with a compact footprint. Tools for manual and automated crimping are also optionally available. Various PCB connectors with crimp connection are also available as a convenient connection solution designed for assembly. Freely selectable cable lengths and cross-sections enable individual cable assemblies in different pitches.

PCB connectors for push-in and crimp available in one product family

Headers available for SMT process and THR soldering

Optimized for cramped installation situations: Operation and conductor connection from one direction

Gold-plated contact points ensure long-termstable transmissionquality
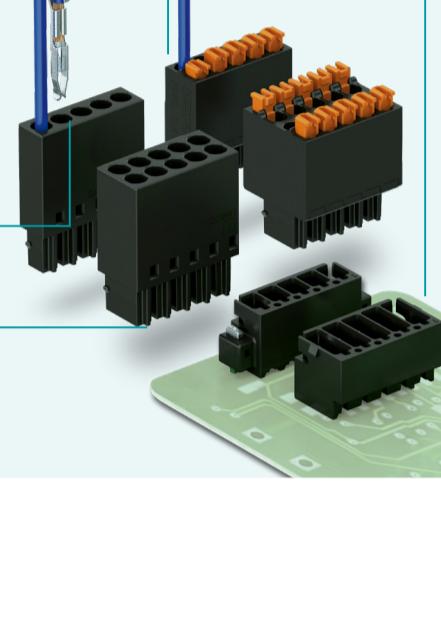
2 System structure

Double-row and single-row PCB connectors with 2.54 mm pitch and crimp connection
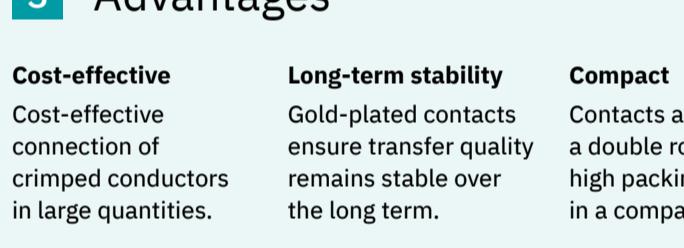
Connection cross-section	0.14 mm² to 0.75 mm²
Nominal current	up to 6 A
Tension	up to 160 V
Grid	2.54 mm
Number of positions	2- to 16-pole with 4 to 32 contacts

3 Advantages

Cost-effective
Cost-effective connection of crimped conductors in large quantities.

Long-term stability
Gold-plated contacts ensure transfer quality remains stable over the long term.

Compact
Contacts arranged in a double row enable high packing density in a compact area.

Optional
Tools for manual and automatic crimping available as an option.

Cable assembly
Freely selectable wire and cross-sections enable individualized cable assemblies in different pitches. More under web code #1975.
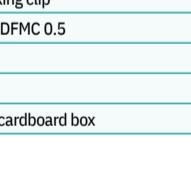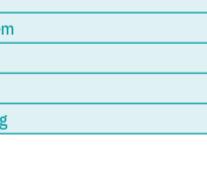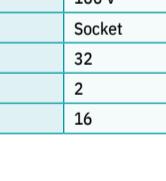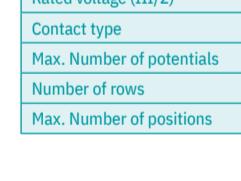
4 Main features

Article family	DMCC 0.5/...-ST		Pitch	2.54 mm
Nominal cross-section	0.75 mm²		Execution	Single-row or double-row
Color	Black		Connection method	Crimp connection
Nominal current	6 A		Connection direction	Conductor/ PCB: 0°
Rated voltage (III/2)	160 V		Locking clip	Without locking clip
Contact type	Socket		Connection system	COMBICON DFMC 0.5
Max. Number of potentials	32		Locking Without	Without
Number of rows	2		Mounting type	Without
Max. Number of positions	16		Type of packaging	Packed in a cardboard box

5 Accessories

Crimp contacts and tools for the D/MCC 0.5 and PTCM 0.5 product family

Contact sizes 0.14 to 0.5 mm² 0.34 to 0.75 mm²	MCC 0.5 (gold-plated)	PTCM 0.5 (tinned)	Crimping pliers and automatic quickchange crimping tool
Female contacts Single contacts or packaging in the belt			Crimping pliers (item number 1064998) are available in the Phoenix Contact eShop. The automatic quick-change tool, also qualified by Phoenix Contact, is available through a partner.
Pin contacts Single contacts or packaging in the belt	–		

6 Learn more
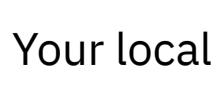
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PHŒNIX CONTACT

M17 and M23 PRO series circular connectors

Securely connected in any situation

click

What to **know:**

1 Intro

Circular connectors from the M17 and M23 PRO families offer uniform solutions for signal and power transmission. Thanks to the unique ONECLICK fast locking system, device connections can be implemented quickly and safely.

Uniform design

Intuitive fast locking system

Standardized assembly concept

Secure connection in industrial applications

Click!

2 System structure

Two-part contact carriers in the M23 power range, for simplified assembly

Cable strain relief up to 156 N

Power connector: Rated voltage 630 V, PE connection to the metal housing

Current carrying capacity of the power contacts up to 30 A per contact

Reliable sealing system, high degree of protection IP66 / IP68 (2m/24h)

Identical flange dimensions for M17 and M23 for uniform housing design at the device manufacturer

Signal connectors with up to 19 poles available

Pin and socket insulators can be used on the field and device side (touch protection: socket side)

Clear design features for intuitive plugging and locking

3 Advantages

Secure connection
ONECLICK fast locking system with a visual, tactile and audible feedback

Easily designed for assembly
Easy and reliable shield connection for cost-effective cable assembly

Vibration-resistant connection
Reliable under the harshest conditions: Cable connectors with vibration brake

Consistently designed
Modern design for highly convenient operation

In the field and on the device
Male and female contact inserts can be used on the field and device side

Compatibility
Device connectors are compatible with standard and ONECLICK fast locking systems

click

USP

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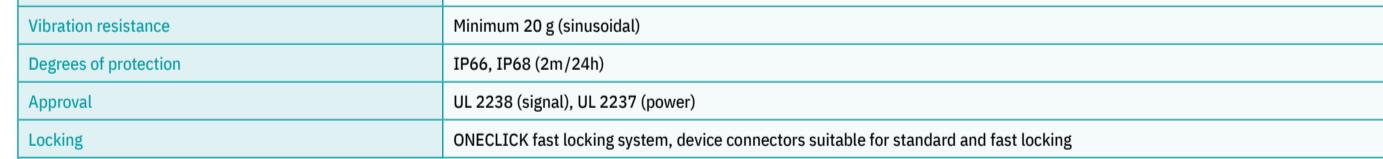
4 Main features

	Features
Voltages	Up to 630 V
Currents	Up to 30 A
Number of positions	4 to 19
Conductor cross-section	0.06 mm² to 4 mm² (M17 to M23)
Outer cable diameter	3 mm to 17 mm (M17 to M23)
Versions	Available in male and female versions
Vibration resistance	Minimum 20 g (sinusoidal)
Degrees of protection	IP66, IP68 (2m/24h)
Approval	UL 2238 (signal), UL 2237 (power)
Locking	ONECLICK fast locking system, device connectors suitable for standard and fast locking
Compatibility	Backward-compatible with standard connections with metric threads
Connection methods	Crimp connection, solder connection and solder-in connection for M23 signal connectors

5 Accessories
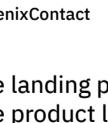
Dust protection cap

IP67 protective caps

Mounting flange

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Modular electronics housings BC
for building automation

1 Intro

Modular electronics housings of the BC series are ideal for future-oriented applications in building automation. The DIN rail housings for the control cabinet impress with their contemporary design, optional touch displays and membrane keypads, versatile PCB connection technology, and 8- or 16-pos. DIN rail connectors. The electronics housings are suitable for use in distribution boards in accordance with DIN 43880 or for wall mounting.

Configurable installation space

Large number of suitable PCB connections

Enclosure cover with displays and membrane keypads

8- or 16-pole DIN rail connectors

Standardized housing dimensions

Available in various widths

2 System structure

Quick access for servicing thanks to touch display

Over 100,000 variants for individual customer requirements

Conductor connection direction for convenient front-panel operation

PCB terminal blocks suitable for wave soldering and THR processes

Coordinated housing and connection system

Bus connector for efficient module-to-module communication

3 Advantages

Rapid device development

The design of the configurable tops is already perfectly adapted to Push-in PCB terminal blocks of the SPT-THR series. Thanks to the housing cover with integrated touch display and membrane keypad, display and operating solutions can be implemented without great effort.

Individual online configuration

Each housing chamber can be configured individually in order to respond to all device requirements. Membrane keypads can be flexibly customized via an online configurator. Shape, color and printing are freely selectable.

Convenient front-panel operation

The Push-in connection at the front enables convenient and tool-free wiring and ensures a permanent and vibration-resistant contact. Wiring errors are avoided and the installer's work is made easier.

Optimized for production processes

In the electronics housings for building communication PCB terminal blocks from the SPT-THR series are used. These are suitable for both wave soldering and THR processes.

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4 Main features

	BC modular upper parts for SPT-THR 1.5/2.5
Width	35.6 mm … 161.6 mm
Max. number of positions per chamber	8 (2.5 mm²)/24 (1.5 mm²)
Color	similar (RAL 7035 and RAL 9005)
Flammability rating	V0 according to UL 94
Ambient conditions	-40 °C … 105 °C
Material	Polycarbonate
Form factor	DIN 43880

	PCB terminal blocks of the SPT-THR 1.5 series	PCB terminal blocks of the SPT-THR 2.5 series
Connection technology	Push-in spring connection	Push-in spring connection
Number of positions	2,3,4	2,3,4,5,6
Rated voltage (IEC)	160 V	400 V
Rated current	17.5 A	32 A
Ambient temperature (operation)	-40 °C … 105 °C	-40 °C … 105 °C
Conductor cross-section	1.5 mm²	4 mm²
Pitch	3.81 mm	5.0 mm

5 Accessories

Accessories for complete enclosures

Touch displays

Fiber optic

KNX pin strip and connector

Bus connector

Cross-Selling

Membrane keypads

PCB terminal blocks and connectors

RJ45 jacks

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PHŒNIX CONTACT

PRC - Pluggable installation system

This plug loves extreme conditions

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1 Intro

Safe power distribution even in extreme environmental conditions. Whether indoors or outdoors, hot or cold, dry or wet: PRC installation connectors reliably secure your power distribution up to 35 A thanks to their high degree of protection and impact resistance up to IK08. The detachable locking with a choice of manual or tool operation also ensures greater flexibility when installing and maintaining your system.

20A

35A

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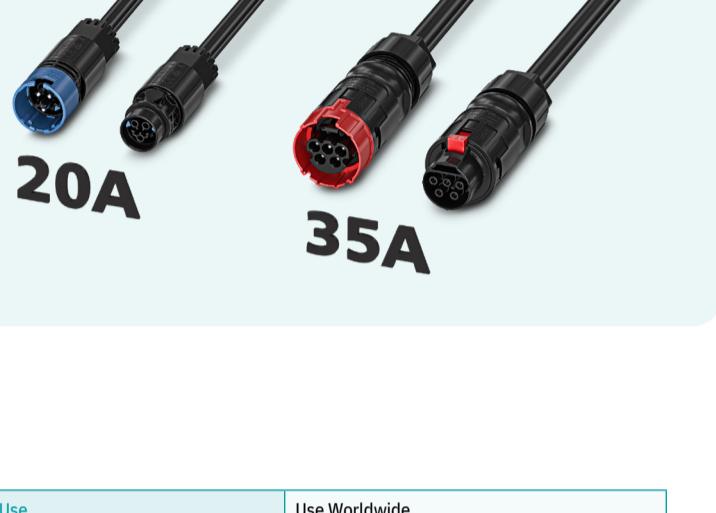
2 System structure

Performance class	35 A	20 A
Rated voltage	690 V AC / 500 V DC	400 V AC / 500 V DC
Rated current	35 A	20 A
Product family	PRC 35	PRC 20

Use	Use Worldwide
Conditions	Indoor + Outdoor
Range of approvals	IEC / UL / DNV
Degree of protection	6X
Impact strength	IK08
Protection class	SKI+SKII
Number of positions	2 … 7
Signal type	Power & Signal

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3 Advantages

Space-saving
More space on the device front thanks to the transmission of high currents in the smallest of spaces up to 35 A.

Flexible
Duo-Unlock locking technology for more flexibility during installation and maintenance.

Robust
Safe use in extreme environmental conditions thanks to high degrees of protection and impact strength.

Simple
Easy handling thanks to proven crimp or screw connection technology.

Faultless
Mechanical and color coding for fast and error-free commissioning.

35A

USP

USP

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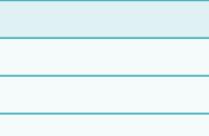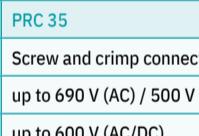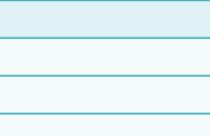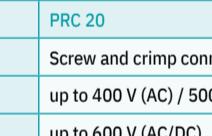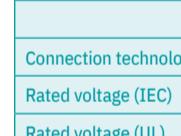
4 Main features

	PRC 20	PRC 35
Connection technology	Screw and crimp connection	Screw and crimp connection
Rated voltage (IEC)	up to 400 V (AC) / 500 V (DC)	up to 690 V (AC) / 500 V (DC)
Rated voltage (UL)	up to 600 V (AC/DC)	up to 600 V (AC/DC)
Rated current	20 A	up to 35 A
Degree of protection	IP66 / IP68 (2 h/2 m) / IP69	IP66 / IP68 (24 h/2 m) / IP69
Impact resistance	IK08 (-25 °C)	IK08 (-25 °C)
Ambient temperature (operation)	-40 °C … +105 °C	-40 °C … +105 °C
Locking type	Duo-Unlock locking mechanism, can be unlocked manually and with tools	Snap-in locking, can be unlocked manually or with tools
Mating cycles	500	2000
Conductor cross-section (rigid & flexible)	0.5 mm²... 2.5 mm²	1.5 mm²... 6.0 mm²
Outer cable diameter	6 mm … 14 mm	8 mm … 21 mm
Licenses	UL, IEC, DNV	UL, IEC, DNV, 2PfG
Coding	Color and mechanical coding	Color and mechanical coding
Special variants	PRC 20/M17 (6-7 poles) & 90° angled variants	45°/90° angled variants

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5 Accessories

Coupler connector

Color coding

Pre-assembled panel feed-throughs and cables

Energy distributor

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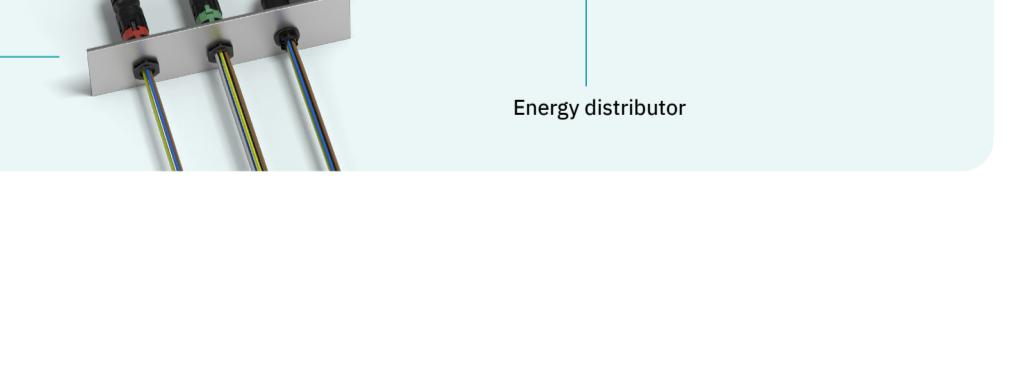
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