ICS

ICS series modular electronics housings

Data sheet
108867_en_00

1 Description

The ICS series modular electronics housing consists of a lower housing part in which you can insert one or two assembled PCBs. The assembled housing is sealed with a cover.

The housings are available in the following dimensions:

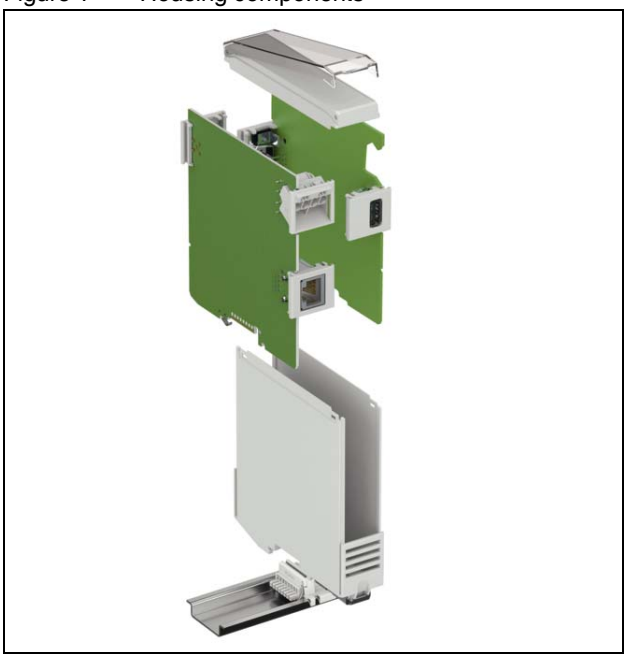
- Overall widths of 20 mm and 25 mm
- Heights of 77.5 mm, 100 mm, and 122.5 mm
- Depths of 87.5 mm, 110 mm, and 132.5 mm

The PCBs can be assembled with various connection technologies:

- PCB headers for PCB connectors with screw or Push-in Technology, 3- and 4-pos., 5.0 mm pitch
- Communication connections, such as RJ45, D-SUB, USB, and antenna connections
- Corresponding connection plates (fillers) are available for these connection technologies.

An 8-pos. DIN rail connector enables data or the power supply to be transmitted from module to module.

Figure 1 Housing components



A configurator for selecting the products is available at phoenixcontact.com, web code: #0512. You can use it to configure your housing. You will then receive 3D data, order lists, and PCB layouts.

Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.net/product/2203878.

This document is valid for the products listed in Section “Ordering data” on page 4.

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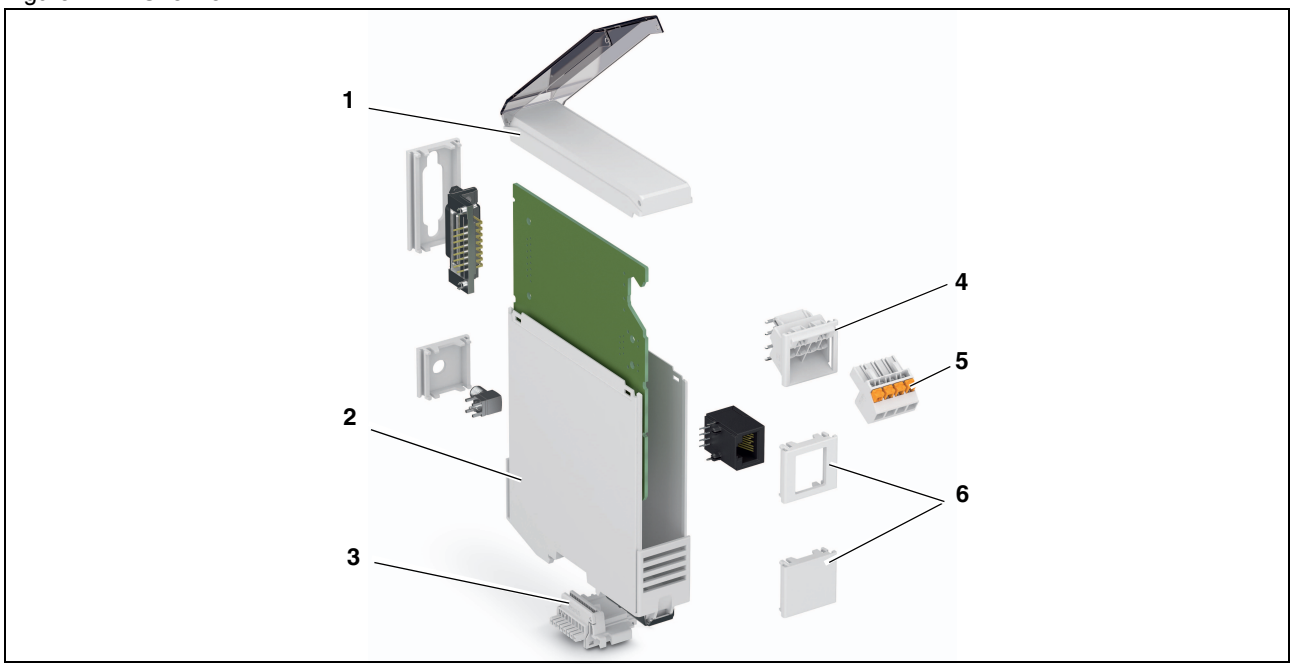
2 Overview of the ICS products

Figure 2 Overview



1 Upper housing part (hinged cover or closed version)
2 Lower housing part
3 DIN rail connector, 8-pos.
4 PCB header
5 PCB connector
6 Connection plates (fillers), with and without function cutout

The PCB is assembled with connection technology and connection plates:

- **PCB headers** for accommodating PCB connectors
- **PCB connectors** with screw or Push-in Technology, 3- and 4-pos., 5.0 mm pitch
- **Communication connections** with corresponding connection plates, such as RJ45, D-SUB, USB, and antenna connections
- Closed **connection plates** or connection plates with vents

The assembled PCB is inserted into the lower housing part. The PCB headers and connection plates have guide slots on the side, which fit the guide rails of the housing panel.

The housing can be optionally combined with a DIN rail connector. Data or the power supply is transmitted from module to module via the DIN rail connector.

The complete product list for ICS modular component housings can be found at phoenixcontact.com, web code: #1636.

3 Ordering data

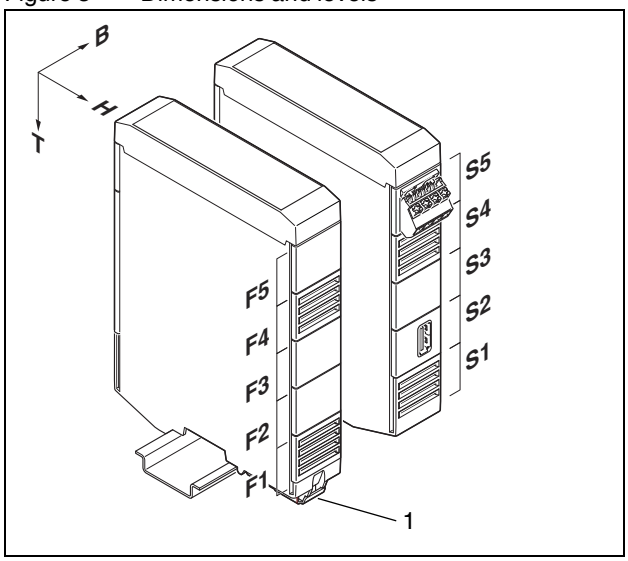
A configurator for selecting the products is available at phoenixcontact.com, web code: #0512. You can use it to configure your housing. You will then receive 3D data, order lists, and PCB layouts.

The housings consist of an upper part and a lower part. The housings are available in the following dimensions:

Width	Height	Depth
20 mm	100 mm	110 mm
25 mm	77.5 mm	87.5 mm
25 mm	100 mm	110 mm
25 mm	100 mm	132.5 mm
25 mm	122.5 mm	110 mm

3.1 Designation of dimensions and levels

Figure 3 Dimensions and levels



The lower housing part has up to five connection levels on both sides, which can be assembled in various ways:

– With connection plates (fillers) for the connection technology
– With headers
– Closed
– With vents

Levels F1 to F5 are located on the same side as the base latch (**1** in Figure 3). S1 to S5 are on the opposite side.

3.2 Order key

The designation of ICS series electronics housings consists of the following components:

Lower housing part

ICS	20	-	B	100	x	98	-	V	O	O	O	O	/	V	O	O	O	O	-	7035
								S1	S2	S3	S4	S5	/	F1	F2	F3	F4	F5		
	Width		Design	Height	x	Depth		Connection levels												Color
			B = lower housing part					**O** = open **S** = closed **V** = vents												**7035** = similar to RAL 7035 (light gray)

Width	x	Height	x	Depth
20 mm	x	100 mm	x	98 mm
25 mm	x	77 mm	x	75 mm
25 mm	x	100 mm	x	98 mm
25 mm	x	100 mm	x	120 mm
25 mm	x	122 mm	x	98 mm

Upper housing part

ICS	20	-	C	100	x	12	-	7035
	Width		Design	Height	x	Depth		Color
			C = upper housing part, closed, without hinged cover **TL** = upper housing part with transparent hinged cover					**7035** = similar to RAL 7035 (light gray)

Width	x	Height	x	Depth
20 mm	x	100 mm	x	12 mm
25 mm	x	77 mm	x	12 mm
25 mm	x	100 mm	x	12 mm
25 mm	x	122 mm	x	12 mm

Connection plate

ICS	20	-	F	22	V	-	7035
	Width		Design **F** = filler	Height 22.5 mm 45 mm	**S** = closed **V** = vents Cutout design **A** = with cutout for antenna **D9** = with cutout for 9-pos. D-SUB **D15** = with cutout for 15-pos. D-SUB **J** = with cutout for RJ45 **U** = with cutout for USB		Color **7035** = similar to RAL 7035 (light gray)

Connection technology

ICC	20	-	H	/	3	L	5,0	-	7035
	Width 20 mm 25 mm		**H** = PCB header		Number of positions **3** = 3-pos. **4** = 4-pos. 20 mm = 3-pos. 25 mm = 4-pos.	**L** = left **R** = right	Pitch		Color **7035** = similar to RAL 7035 (light gray)

ICC	20	-	PPC	2,5	/	3	5,0	-	7035
	Width 20 mm 25 mm		**PP** = Push-in PCB connector **PPC** = Push-in PCB connector, codable **PS** = PCB connector with screw connection **PSC** = PCB connector with screw connection, codable	Conductor cross section 2.5 mm^2		Number of positions **3** = 3-pos. **4** = 4-pos. 20 mm = 3-pos. 25 mm = 4-pos.	Pitch		Color **7035** = similar to RAL 7035 (light gray)

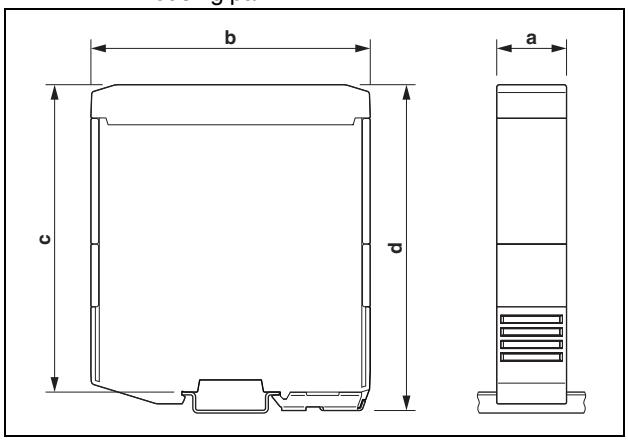
4 Technical data

Housing design	
Insulation material	PA (polyamide)
Flammability rating UL 94	V0
Degree of protection in accordance with DIN EN 60259	IP20
Power dissipation PV at 20°C in the horizontal mounting position	5.2 W ... 10.4 W
Electrical data	
DIN rail connector, nominal voltage	30 V
DIN rail connector, nominal current	6 A, parallel contacts only 4 A, up to two serial contacts 40 A maximum total current
Temperature range	
Ambient temperature, operation	-40°C ... +105°C
Ambient temperature, transport/storage	-40°C ... +55°C
Humidity	80%

5 Housing dimensions

5.1 External dimensions with upper housing part

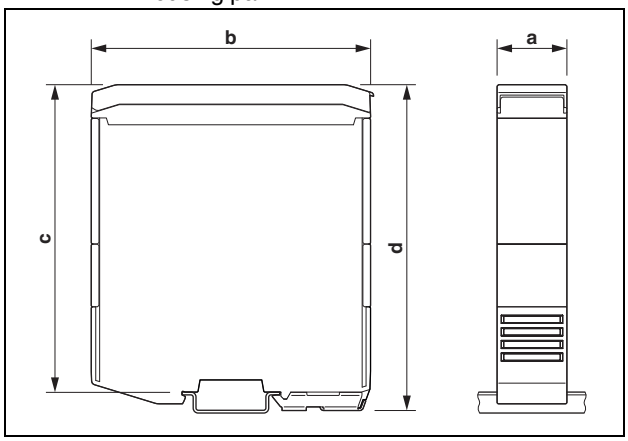
Figure 4 Lower housing part with ICS...-C... upper housing part



Lower housing part with ICS...-C upper housing part			
Width (a)	**Height (b)**	**Depth (c)**	**Depth (d)**
20 mm	100 mm	110 mm	116.6
25 mm	77.5 mm	87.5 mm	94.1
25 mm	100 mm	110 mm	116.6
25 mm	100 mm	132.6 mm	139.2
25 mm	122.5 mm	110 mm	116.6

5.2 External dimensions with hinged cover

Figure 5 Lower housing part with ICS...-TL... upper housing part



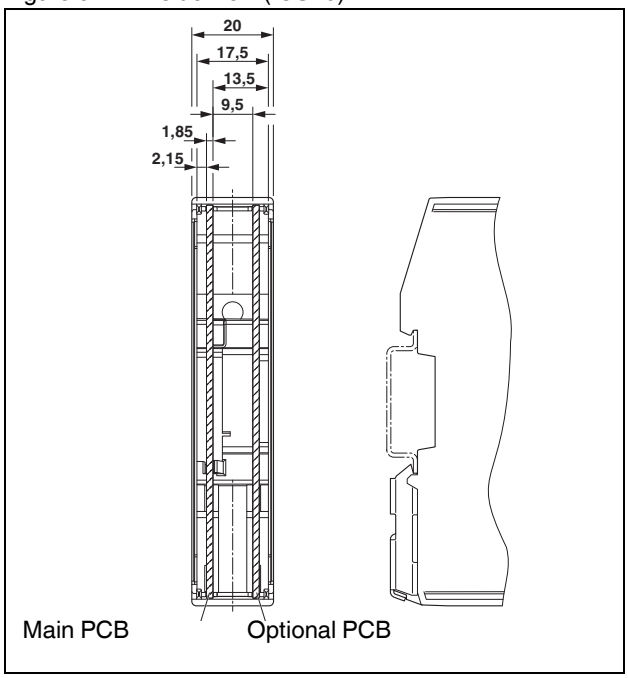
Lower housing part with ICS...-TL upper housing part			
Width (a)	**Height (b)**	**Depth (c)**	**Depth (d)**
20 mm	100 mm	110 mm	116.6
25 mm	77.5 mm	87.5 mm	94.1
25 mm	100 mm	110 mm	116.6
25 mm	100 mm	132.6 mm	139.2
25 mm	122.5 mm	110 mm	116.6

With both cover versions, the assembled housings have the same overall depth. The closed cover and the hinged cover are the same depth. As the hinged cover includes a transparent lid, you can only install a shorter PCB.

5.3 Internal dimensions of lower housing part

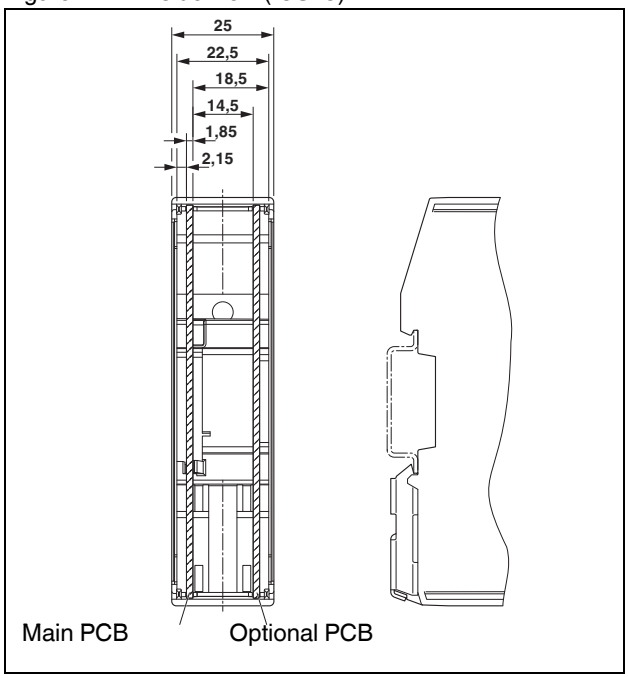
The housings in 20 mm and 25 mm widths are designed for the installation of one or two PCBs. When two PCBs are installed, only the left printed circuit board makes contact with the DIN rail connector.

Figure 6 Inside view (ICS20)



Recommended PCB thickness	1.6 mm ±0.2 mm

Figure 7 Inside view (ICS25)

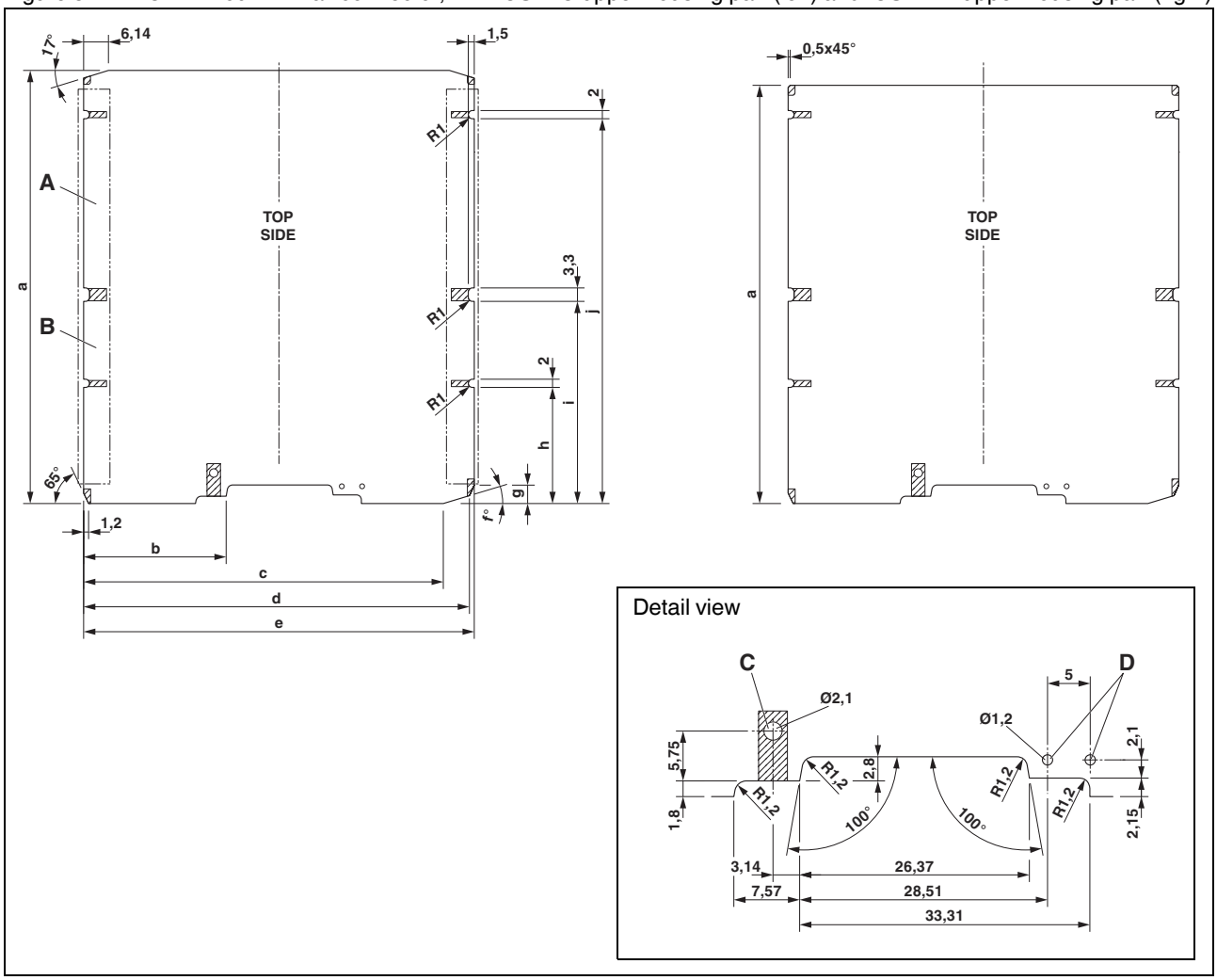


Recommended PCB thickness	1.6 mm ±0.2 mm

6 PCB dimensions

6.1 PCB without DIN rail connector

Figure 8 PCB without DIN rail connector, with ICS...-C upper housing part (left) and ICS...-TL upper housing part (right)

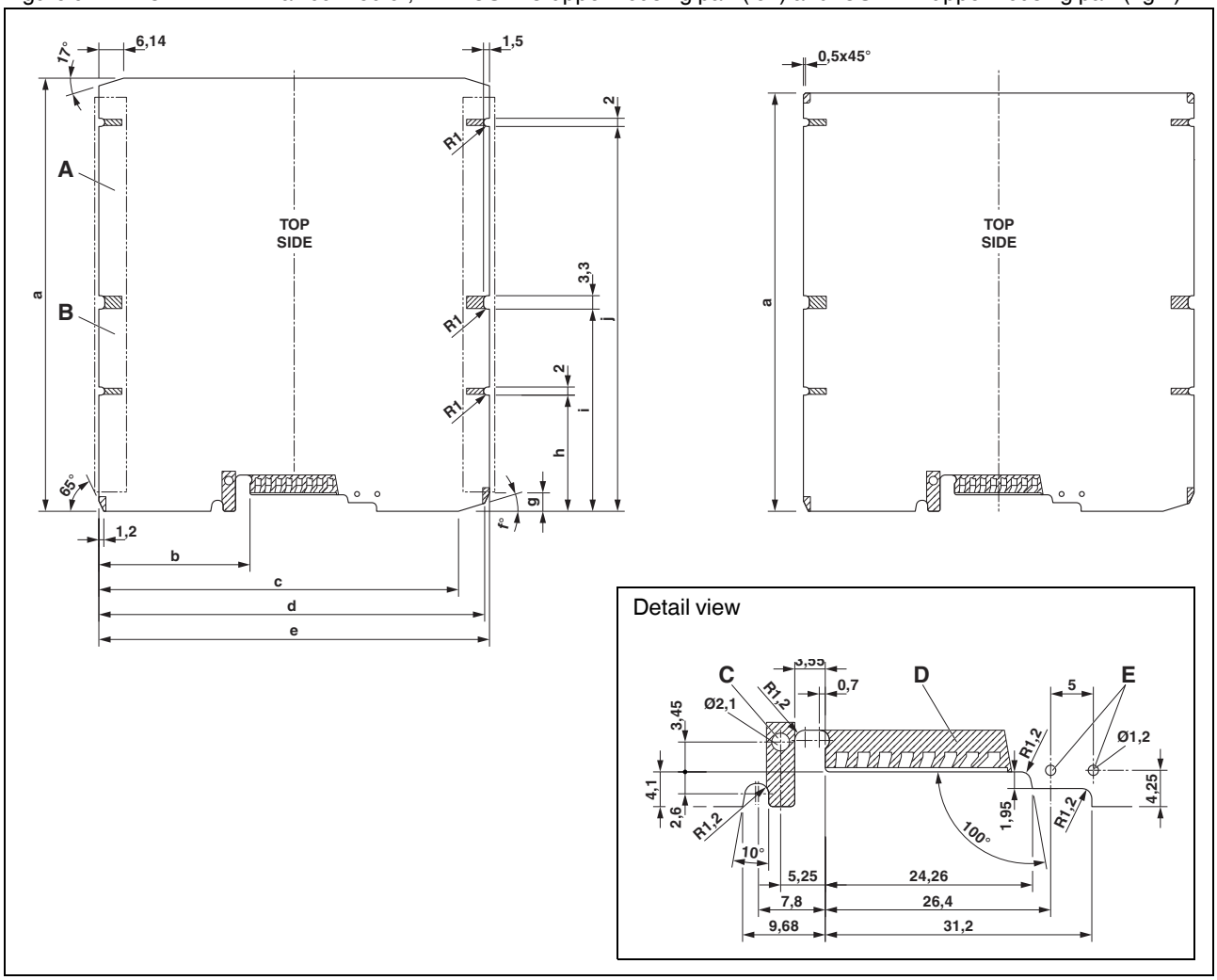


Lower housing part with upper housing part of type ICS-...		PCB [mm]												
		-C	-TL			-C	-TL			-C	-TL			
Height	Depth	a	a	b	c	d	d	e	f [°]	g	g	h	i	j
77.5 mm	87.5 mm	84.2	80.55	23.89	72.6	–	–	73.8	65°	–	–	6.15	27.35	72.35
100 mm	110 mm	106.75	103.1	35.14	88.65	95.1	95.1	96.3	17°	4.55	4.55	28.65	49.85	94.85
100 mm	132.5 mm	129.3	125.65	35.14	88.65	95.1	95.1	96.3	17°	4.55	4.55	28.65	72.35	117.35
122.5 mm	110 mm	106.75	103.1	46.39	99.9	–	117.6	118.8	17°	–	7.98	28.65	49.85	94.85

Keep-out zone, no components at these positions

6.2 PCB with DIN rail connector

Figure 9 PCB with DIN rail connector, with ICS...-C upper housing part (left) and ICS...-TL upper housing part (right)



Lower housing part with upper housing part of type ICS-...		PCB [mm]										
		-C	-TL									
Height	Depth	a	a	b	c	d	e	f [°]	g	h	i	j
77.5 mm	87.5 mm	84.2	80.55	26	–	72.6	73.8	65°	–	6.15	27.35	72.35
100 mm	110 mm	106.75	103.1	37.25	88.65	95.1	96.3	17°	4.55	28.65	49.85	94.85
100 mm	132.5 mm	129.3	125.65	37.25	88.65	95.1	96.3	17°	4.55	28.65	72.35	117.35
122.5 mm	110 mm	106.75	103.1	48.5	99.9	117.6	118.8	17°	7.98	28.65	49.85	94.85

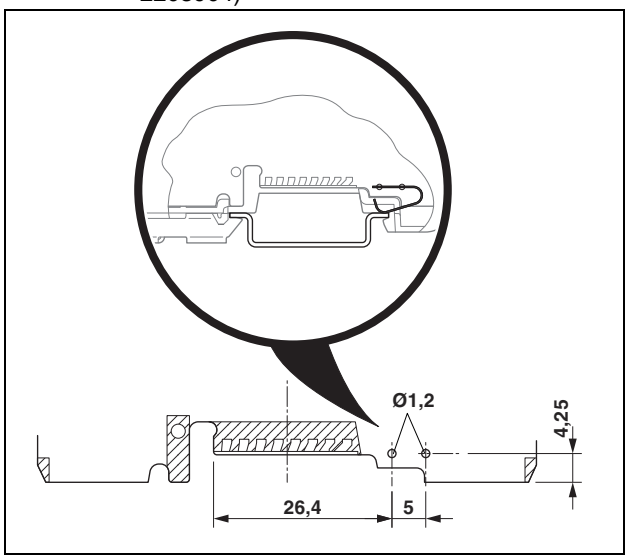
Keep-out zone, no components at these positions

6.3 PCB with FE contact

The FE contact establishes contact between the electronics module and the DIN rail in order to discharge electromagnetic interference.

You must provide two holes on the PCB for the FE contact.

Figure 10 Holes for FE contact (ICS-FE-CONTACT, 2203904)



For information on how to mount the FE contact, please refer to Page 18.

6.4 PCB with hole for snap-on mounting

The PCB has a hole where a hook snaps in during mounting.

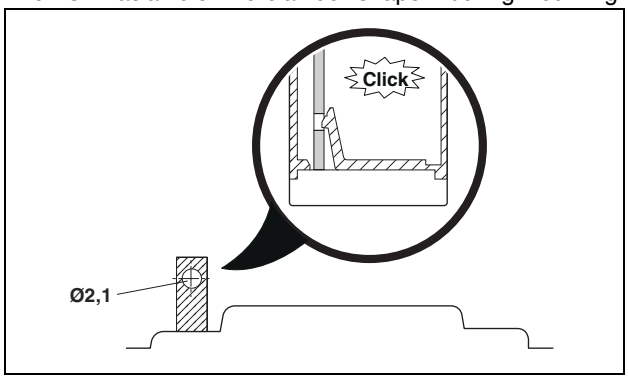


Figure 11 Snap-on mounting

For information on how to mount the PCB, please refer to Page 18.

7 Connection technology

7.1 PCB headers, 5.0 mm pitch

Figure 12 ICC20-H PCB header

The latest data and drawings for the product can be found at phoenixcontact.com.

ICC...-H...

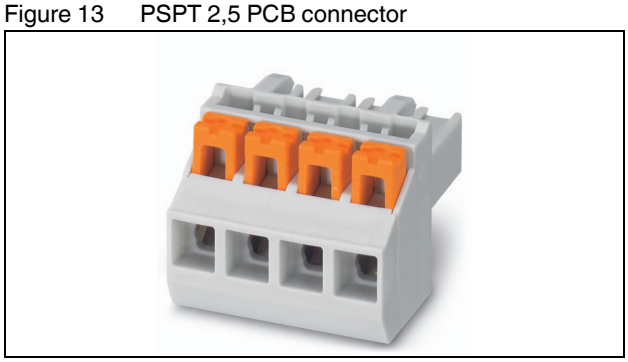
Dimensions	
Pitch	5.0 mm
Length of solder pin	3.5 mm

Item		Number of positions
ICC20-H/3L5,0-7035	2203900	3
ICC20-H/3R5,0-7035	2203901	3
ICC25-H/4L5,0-7035	2203902	4
ICC25-H/4R5,0-7035	2203903	4

Technical data	
Insulation material group	I
Rated surge voltage (III/3)	4 kV
Rated surge voltage (III/2)	4 kV
Rated surge voltage (II/2)	4 kV
Rated voltage (III/3)	250 V
Rated voltage (III/2)	320 V
Rated voltage (II/2)	630 V
Nominal current I_N	16 A
Insulation material	PA
Flammability rating UL 94	V0

7.2 PCB connectors, 5.0 mm pitch, Push-in connection

Figure 13 PSPT 2,5 PCB connector



The latest data and drawings for the product can be found at phoenixcontact.com.

PSPT 2,5/ ...-ST

Dimensions	
Pitch	5.0 mm

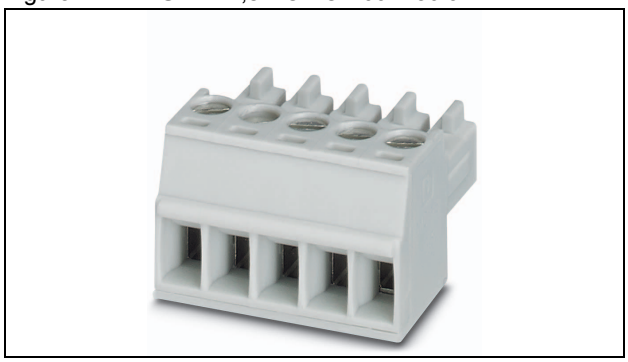
Item		Dimension a	Number of positions
PSPT 2,5/ 3-ST KMGY	2202345	10	3
PSPT 2,5/ 4-ST KMGY	2202344	15	4

Technical data	
Insulation material group	PA / I
Rated surge voltage (III/3)	4 kV
Rated surge voltage (III/2)	4 kV
Rated surge voltage (II/2)	4 kV
Rated voltage (III/3)	250 V
Rated voltage (III/2)	320 V
Rated voltage (II/2)	630 V
Connection in accordance with standard	EN-VDE
Nominal current I_N	16 A
Maximum load current, for 2.5 mm² conductor cross section	16 A
Nominal cross section	2.5 mm²
Insulation material	PA
Flammability rating UL 94	V0

Conductor cross section	
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 16
Conductor cross section flexible with ferrule without plastic sleeve	0.20 mm² ... 2.5 mm²
Conductor cross section flexible with ferrule and plastic sleeve	0.25 mm² ... 2.5 mm²
Two conductors with the same cross section flexible with ferrule without plastic sleeve	0.25 mm² ... 0.34 mm²
Two conductors with the same cross section flexible with TWIN ferrule and plastic sleeve	0.5 mm² ... 1.5 mm²

7.3 PCB connectors, 5.0 mm pitch, screw connection

Figure 14 MSTBT 2,5 HC PCB connector



The latest data and drawings for the product can be found at phoenixcontact.com.

MSTBT 2,5 HC

Dimensions	
Pitch	5.0 mm

Item		Number of positions
MSTBT 2,5 HC/ 3-STP GY7035	2200333	3
MSTBT 2,5 HC/ 4-STP GY7035	2200332	4

Technical data	
Insulation material group	PA / I
Rated surge voltage (III/3)	4 kV
Rated surge voltage (III/2)	4 kV
Rated surge voltage (II/2)	4 kV
Rated voltage (III/3)	250 V
Rated voltage (III/2)	320 V
Rated voltage (II/2)	630 V
Connection in accordance with standard	EN-VDE
Nominal current I_N	16 A
Maximum load current, for 2.5 mm² conductor cross section	16 A
Nominal cross section	2.5 mm²
Insulation material	PA
Flammability rating UL 94	V0
Internal cylindrical gauge	A3
Stripping length	7 mm
Screw thread	M3
Tightening torque min.	0.5 ... 0.6 Nm

Conductor cross section	
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 12
Two conductors with the same cross section rigid	0.2 mm² ... 1 mm²
Two conductors with the same cross section flexible	0.2 mm² ... 1.5 mm²
Two conductors with the same cross section flexible with ferrule without plastic sleeve	0.25 mm² ... 1 mm²
Two conductors with the same cross section flexible with TWIN ferrule and plastic sleeve	0.5 mm² ... 1.5 mm²

7.4 DIN rail connector, 8-pos.

An 8-pos. DIN rail connector enables data or the power supply to be transmitted from module to module. It is inserted in the DIN rail and replaces individual wiring.

The housings in 20 mm and 25 mm widths are designed for the installation of one or two PCBs. When two PCBs are installed, only the left printed circuit board makes contact with the DIN rail connector.

The TBUS8 is available with parallel and serial contacts.

– P = parallel contact (8, maximum)

  The same signal and voltage are applied to each parallel contact.

– S = serial contact (2, maximum)

  A serial contact makes contact with the component side of the PCB. The signal is routed across the PCB and processed. On the soldering side of the PCB, the signal is connected to the mating contact. When you remove a housing, the voltage and signal flow is interrupted.

Contacts 1 to 8 are counted starting at the swiveling side. The serial contacts are at positions 7 and 8. If you swivel open the housing, the serial contacts are the last ones to be connected to the PCB.

You can combine the different TBUS8 versions. However, the versions are not coded against incorrect insertion of the differently contacted PCBs.

Figure 15 Position of the PCB (TBUS8-20,0 in the example)

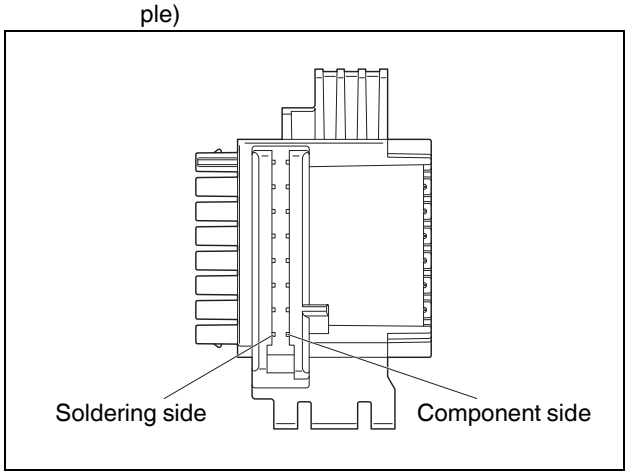
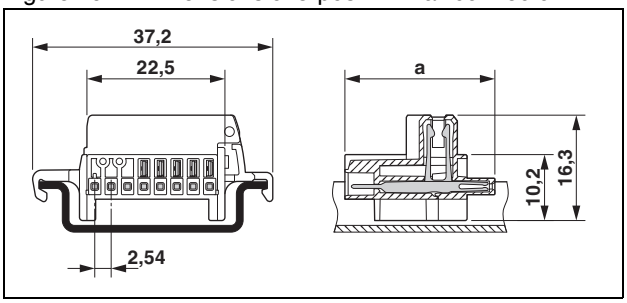


Figure 16 Dimensions of 8-pos. DIN rail connector



DIN rail connector	Dimension a
TBUS8-20,0-...	24.3 mm
TBUS8-25,0-...	29.3 mm

TBUS8-....

Dimensions/positions	
Pitch	2.54 mm
Number of positions	8

Technical data	
Insulation material group	I (CTI 600)
Rated surge voltage (III/2)	1.5 kV
Rated surge voltage (II/2)	1.5 kV
Rated voltage (III/3)	32 V
Rated voltage (III/2)	32 V
Connection in accordance with standard DIN EN 61984	✓
Nominal current I_N, parallel contacts	6 A
Nominal current I_N, serial contacts	4 A
Nominal voltage U_N, maximum	30 V
Insulation material	PA
Flammability rating UL 94	V0

Soldering pad geometry

For the geometry of the soldering pad, please refer to the download area for the relevant item at phoenixcontact.com.

– TBUS8-20,0-PPPPPPPP-7035 2202889
– TBUS8-20,0-PPPPPPPS-7035 2202894
– TBUS8-20,0-PPPPPPSS-7035 2202892
– TBUS8-25,0-PPPPPPPP-7035 2202891
– TBUS8-25,0-PPPPPPPS-7035 2202890
– TBUS8-25,0-PPPPPPSS-7035 2202895

Figure 17 Detailed dimensional drawing of TBUS8-...-PPPPPPPP contact pads

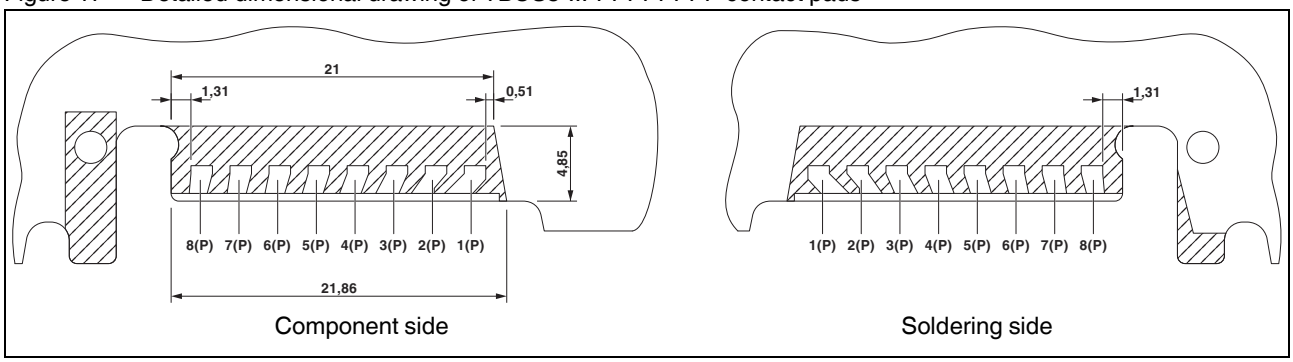


Figure 18 Detailed dimensional drawing of TBUS8-...-PPPPPPPS contact pads

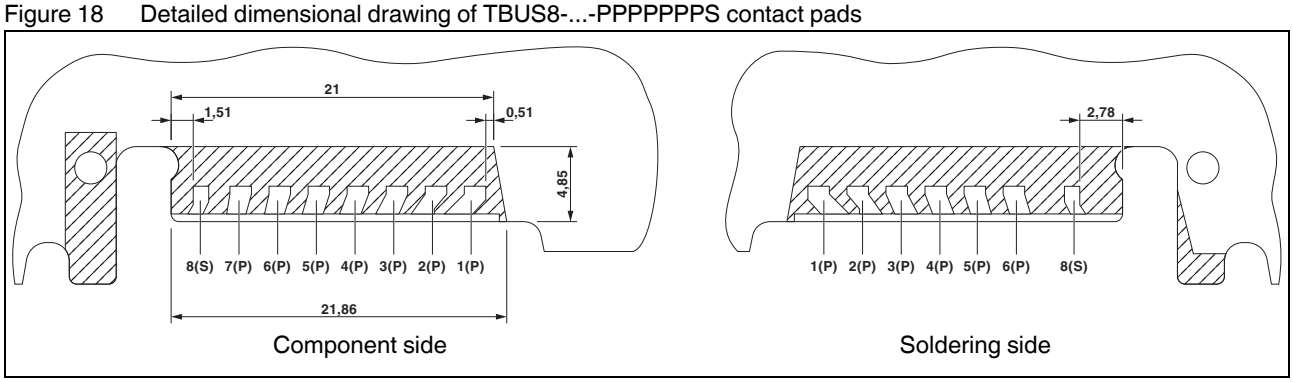
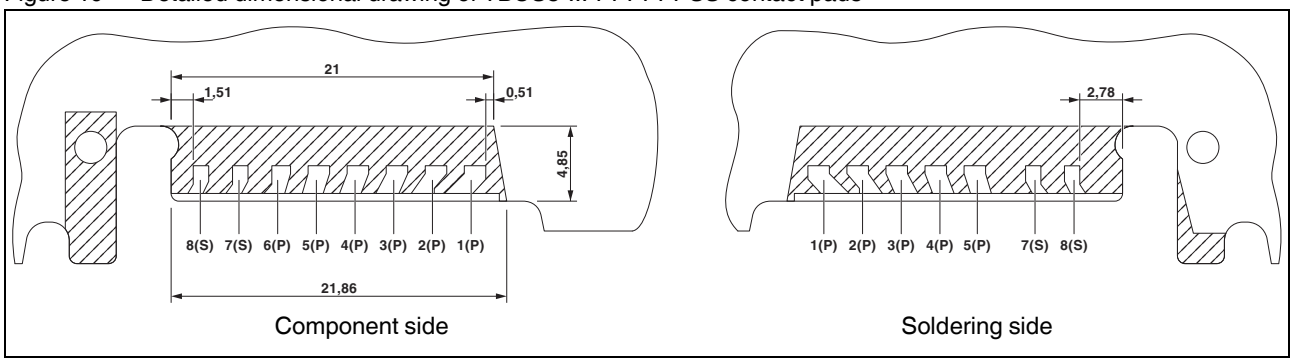


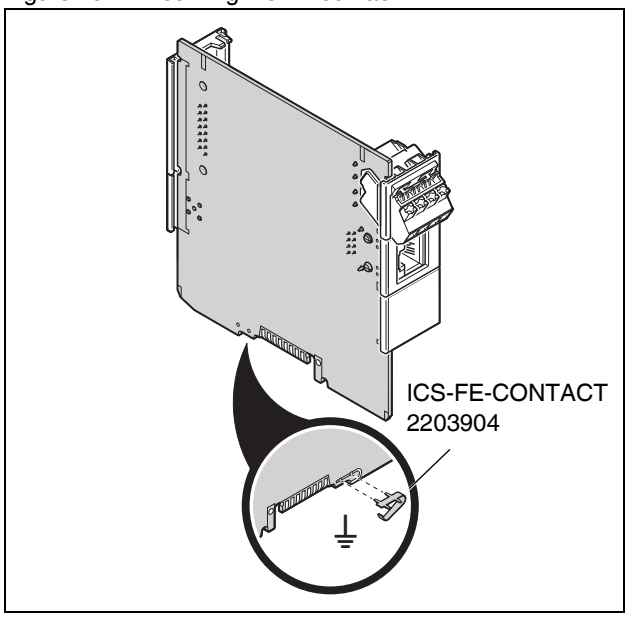
Figure 19 Detailed dimensional drawing of TBUS8-...-PPPPPPSS contact pads



8 Mounting the housing

8.1 Mounting the FE contact

Figure 20 Mounting the FE contact



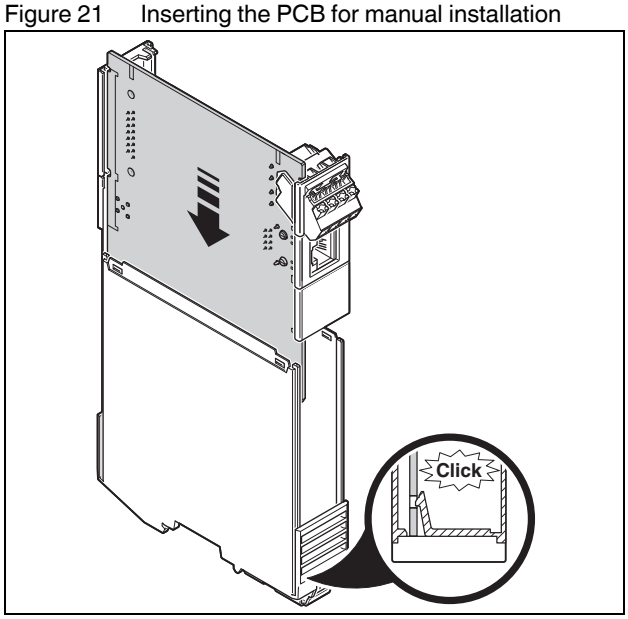
- Fix the FE contact at the intended location on the PCB.

  The FE contact is mounted on the component side of the PCB. If using two PCBs, you only need to mount an FE contact on the first PCB. The open side of the FE contact points to the DIN rail.

8.2 Inserting the PCB

Manual installation

Figure 21 Inserting the PCB for manual installation

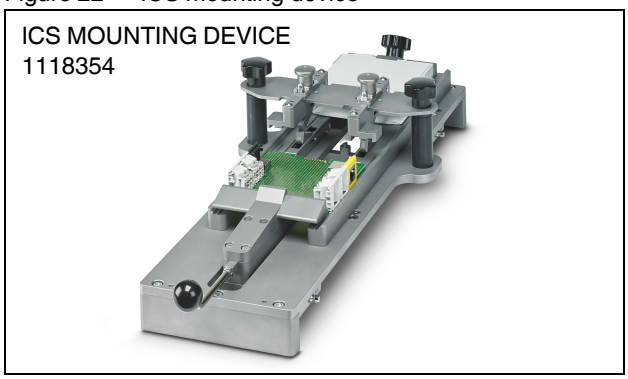


- Insert the PCB into the guide slot of the housing.
- Push the PCB downward until it audibly snaps in.

For manual installation, we recommend positioning the housing differently from the way shown above.

ICS mounting device

Figure 22 ICS mounting device



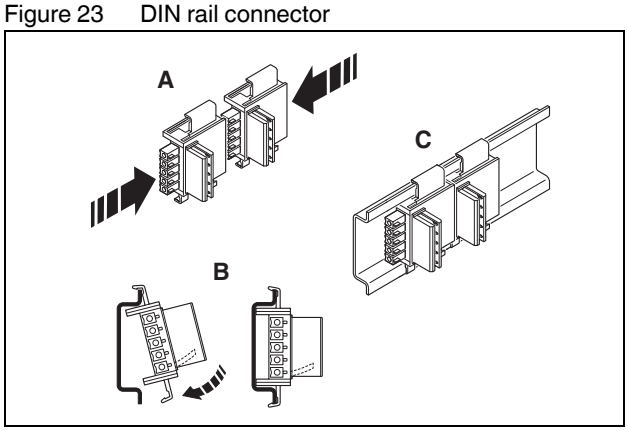
The mounting device enables you to quickly and easily insert the assembled PCB in the fixed housing.

8.3 Mounting the DIN rail connector

If using a DIN rail connector, you must first insert it into the DIN rail.

The DIN rail connector is used to bridge the power supply and communication.

Figure 23 DIN rail connector



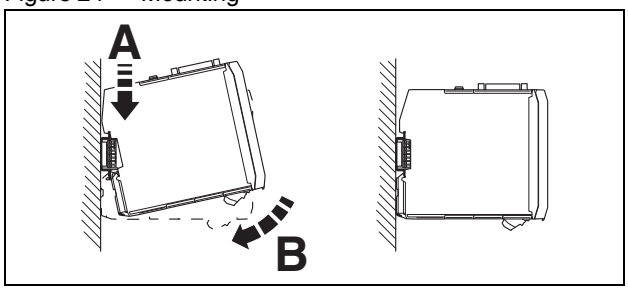
Observe the snap-in direction of the housing and DIN rail connector: snap-on foot below and connector on the left.

- Connect the DIN rail connectors together.
- Push the connected DIN rail connectors onto the DIN rail.
- Place the device onto the DIN rail from above.
- Push the front of the device toward the mounting surface until it audibly snaps into place.

8.4 Mounting the housing on a DIN rail

Mounting

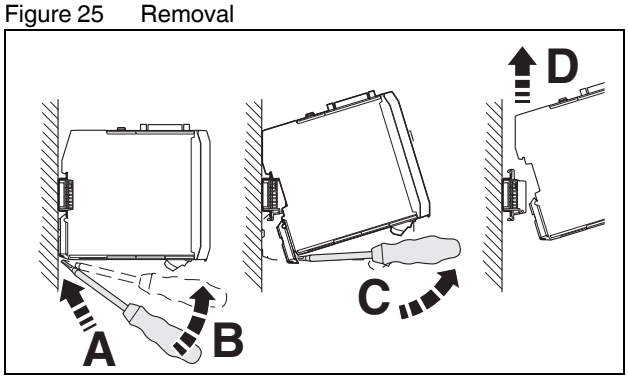
Figure 24 Mounting



- Place the device onto a 35 mm DIN rail from above. The upper housing keyway hooks onto the top edge of the DIN rail (A).
- Holding the device by the housing cover, carefully push it toward the mounting surface (B).
- Once the snap-on foot has audibly snapped onto the DIN rail, check that it is attached securely.

Removal

Figure 25 Removal



- When using DIN rail connectors: disconnect all elements from the power supply. Wait until the capacitors are discharged.
- Use a suitable screwdriver to release the locking mechanism on the snap-on foot of the device (A, B).
- Leave the screwdriver inserted. Tilt the housing upward to disengage the DIN rail connector (C). Otherwise the snap-on foot will get caught on the DIN rail connector.
- Carefully lift the device off the DIN rail (D).

8.5 Connecting conductors (Push-in connection)

1.5 mm² ... 2.5 mm² conductor cross section, rigid or with ferrule

- Insert the stripped conductor into the round opening of the terminal block without using a tool.

Conductors with a smaller cross section or flexible conductors without ferrules

- Press the push button with a screwdriver to open the spring.
- Insert the conductor into the round opening of the terminal block.

Removal

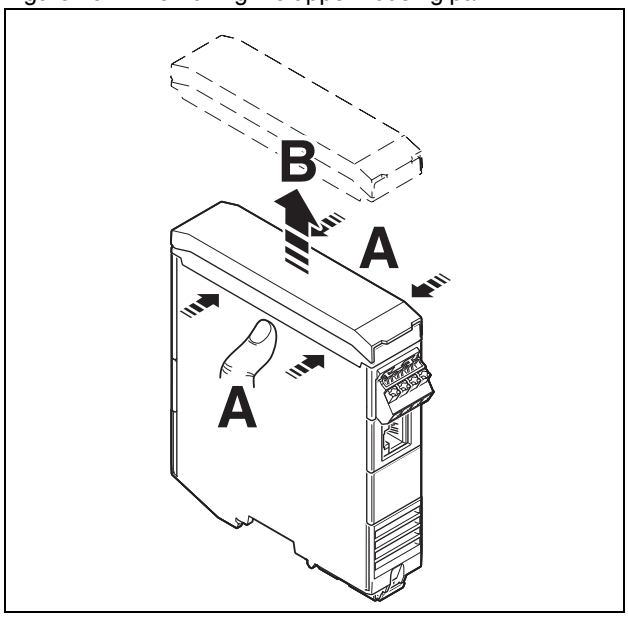
- To release, press the push button with a screwdriver.
- Pull out the conductor.

We recommend the following bladed screwdriver:
SZS 0,4X2,5 VDE, 1205037.

9 Removing the housing

9.1 Removing the upper housing part

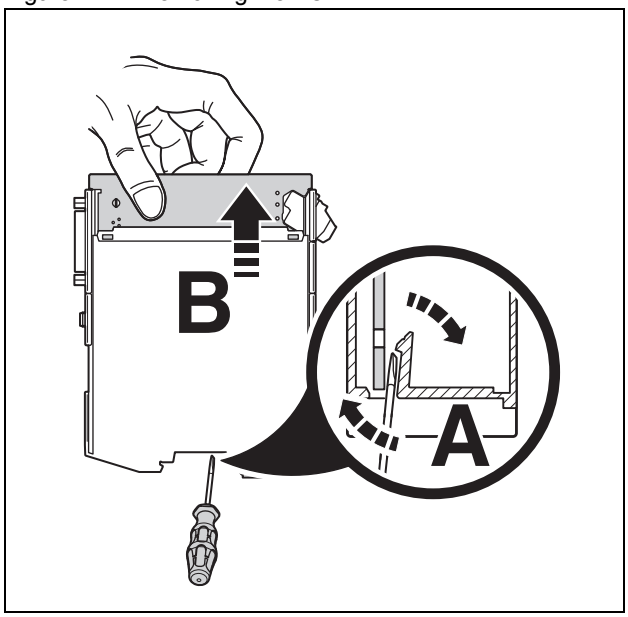
Figure 26 Removing the upper housing part



- Press on both sides of the lower housing part until you can remove the upper housing part.

9.2 Removing the PCB

Figure 27 Removing the PCB



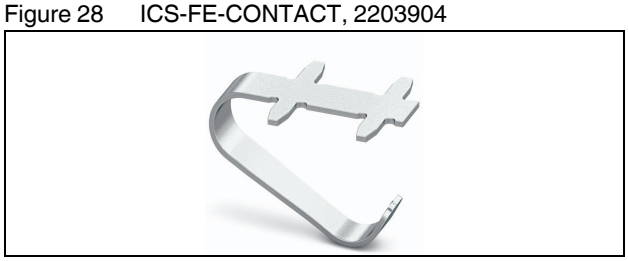
- Disengage the PCB latching with a screwdriver.

10 Accessories and customization

10.1 Accessories

FE contact (functional ground contact)

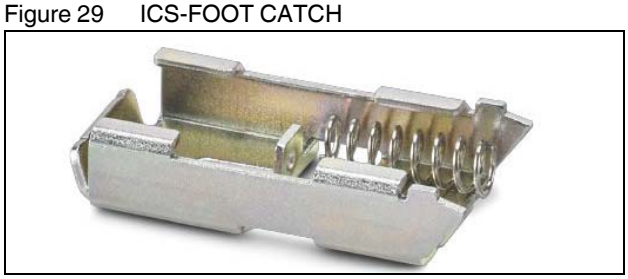
Figure 28 ICS-FE-CONTACT, 2203904



When you snap the housing onto a DIN rail, you can establish a conductive connection between the PCB and the DIN rail.

Base latch

Figure 29 ICS-FOOT CATCH



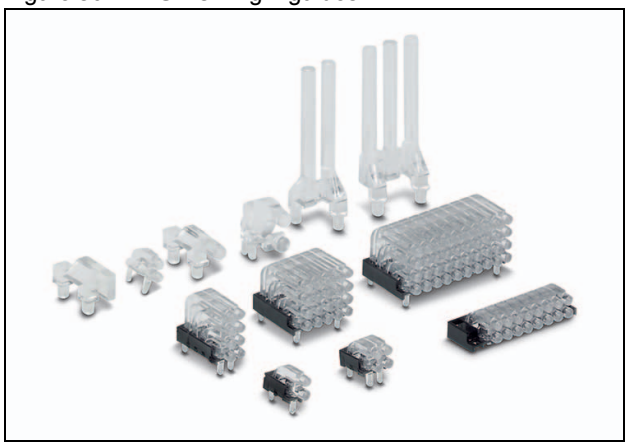
The metal base latch is used to securely attach the housing to the DIN rail.

Different versions are available according to height of the housing.

- ICS-FOOT CATCH-H77 KIT, 1143118
- ICS-FOOT CATCH-H100 KIT, 1143120
- ICS-FOOT CATCH-H122 KIT, 1143121

HS-LC light guides

Figure 30 HS-LC... light guides



Light guides for visualization are available in a variety of designs. The HS-LC... light guides are fixed to the PCB.

The complete list of accessories can be found at phoenixcontact.com, web code: #1638.

10.2 Housing customization

Customer-specific solutions are available in addition to the standard range.

- **Color variants**
- **Markings** using different printing technologies
  - Pad printing: ideal for single-color or two-color printing
  - Screen printing: for multi-color markings on larger surfaces
  - Laser marking: particularly suitable for content that changes on a regular basis, e.g., serial numbers
- **Mechanical processing** of the housing parts.
- **Custom upper housing parts** can be created. A configurator is available on the Phoenix Contact website, which you can use to create your own upper housing parts. These upper housing parts are produced by our 3D printing service. They serve as prototypes for subsequent series production.

For further information, please visit phoenixcontact.com, web code: #0685.