UCS

UCS series universal electronics housings

Data sheet
107750_en_06

1 Description

The UCS universal electronics housings consist of two identical housing half shells, four side panels, and color-coded corner inlays.

The corner inlays are available in two versions. Corner inlays with integrated screw boss enable a maximum printed circuit board (PCB) surface. You can position the PCB flexibly with the version featuring adhesive pads. Both versions are available as complete sets in five sizes, two depths, and two colors.

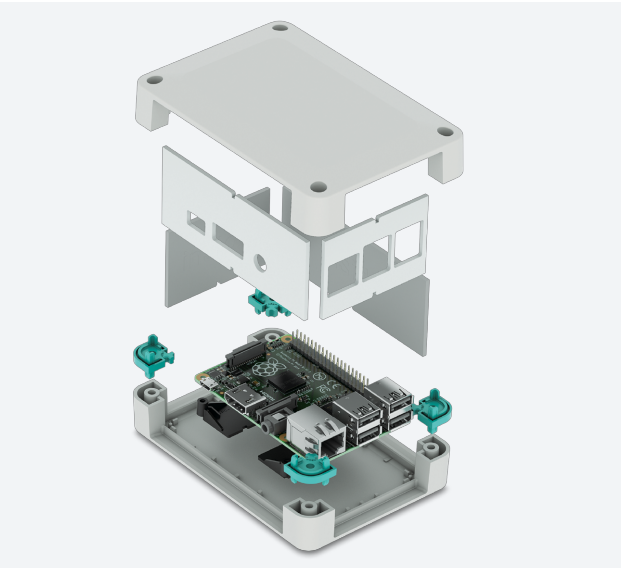
If the right combination is not available, you can select all the components individually and configure a custom housing solution.

The housings can be selected according to the form factor (e.g., ETX, ITX, etc.) as well as according to the dimensions of your PCB.

Complete sets with ready-machined side panels are available for the Raspberry Pi single-board computer.

Connection systems as well as display and control elements can be installed in the housings. We can incorporate the necessary recesses for you.

Figure 1 Housing components



Observe these notes

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.com/products.

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

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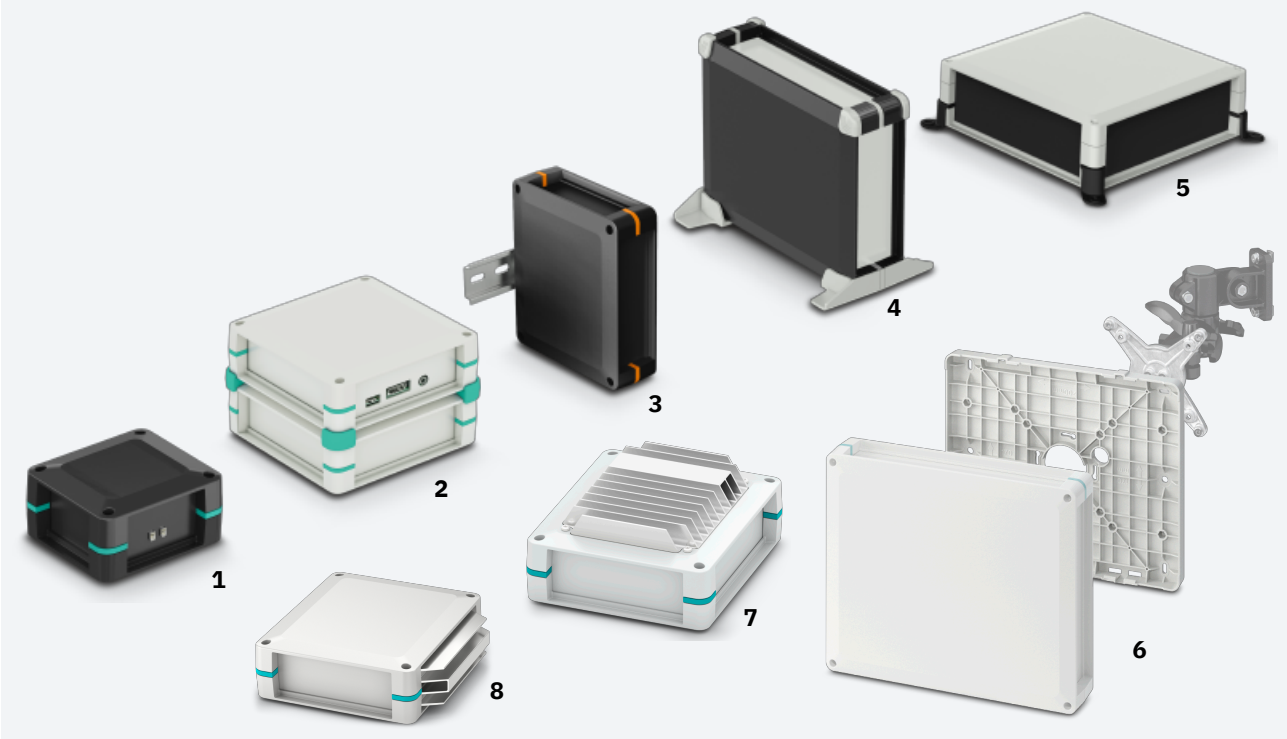
2 Overview of UCS products

Figure 2 Overview



Accessories are available for setting up the housing.

1 **Example of a housing** with removable side panels and in two installed heights (without accessories for set-up)

2 **Stacking adapters** for connecting housings of the same size

3 **DIN rail adapter** for these housing sizes (instead of a side panel):
- 125 mm x 87 mm (for longer side panel only)
- 145 mm x 125 mm
- 195 mm x 145 mm (for shorter side panel only)

4 **Corner guards**, anti-slip

Stand for upright housings, for the 47 mm version only

5 **Wall bracket**, special corner inlays with longitudinal hole for wall mounting

6 **Mounting panel**, for attaching UCS housings (for sizes 125-87 to 237-195 only)
- On a VESA display mount (shown)
- On a wall
- On a machine profile
- On a wall outlet box

Housings with heatsinks

Electronic components with high power can generate a lot of heat. This can impair the electronic performance and service life of components. To prevent overheating, aluminum heatsinks are available for the UCS housing series. The heatsinks can be integrated into the half shell or into the side panel of the housing.

7 Integrated **half shell heatsink**

8 Integrated **side panel heatsink**

The complete product list for the UCS modular component housings can be found at phoenixcontact.com, web code: #0854.

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.

3.1 Order key

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

Complete set

UCS	195	- 145	- F	- CCD	9005
	Length	Width	Depth	PCB mounting	Color
	87 mm	87 mm	F = 47 mm	CCD = corner inlays with screw boss	7035 = similar to RAL 7035
	125 mm	87 mm	H = 67 mm	GD = adhesive pad	9005 = similar to RAL 9005
	145 mm	125 mm		RPI = Raspberry Pi	
	195 mm	145 mm			
	237 mm	195 mm			

Single parts

UCS	HAC	195	-145[1]	- F	- 9005
	Type	Length	Width	Depth	Color
	CC = corner inlays	87 mm	87 mm	F = 47 mm	AL = aluminum
	CCD = corner inlays with screw boss	125 mm	87 mm	H = 67 mm	1018 = similar to RAL 1018
	CP = corner guards	145 mm	125 mm		2003 = similar to RAL 2003
	CS = stack corners	195 mm	145 mm		3001 = similar to RAL 3001
	DIN = DIN rail adapter	237 mm	195 mm		5010 = similar to RAL 5010
	GD = adhesive pad				5015 = similar to RAL 5015
	HAC = height adapter				5018 = similar to RAL 5018
	HH = half shell				7035 = similar to RAL 7035
	HH-HS = half shell for heatsink				9005 = similar to RAL 9005
	HH-HSAS = half shell with heatsink and heat spreader				
	HS = heatsink				
	HSP = heat spreader				
	PED = stand				
	SB = spacing bolts				
	SF = screw set, flat housings				
	SH = screw set, tall housings				
	SW = side panel				
	WM-B = basic wall bracket				
	WM-MP = mounting panel				

[1] For the half shells (UCS HH...) only

3.2 Product list for complete sets

		UCS 87-87...		UCS 125-87...		UCS 145-125...		UCS 195 -145...		UCS 237 -195...	
	RAL	47 mm	67 mm	47 mm	67 mm	47 mm	67 mm	47 mm	67 mm	47 mm	67 mm
Complete set with PCB mounting, flexibly positionable PCBs											
	7035[1]	**1349259**	**1355983**	**2203328**	**2203331**	**2203332**	**2203334**	**2203336**	**2203338**	**2203341**	**2203344**
	9005[1]	**1355985**	**1349262**	**2203329**	**2203330**	**2203333**	**2203335**	**2203337**	**2203340**	**2203342**	**2203345**
Complete set with integrated 2.4" touch display											
	7035[1]			**1246286**							
	9005[1]			**1246287**							
Complete set with PCB mounting, flexibly positionable PCBs, suitable for the following form factors											
Raspberry Pi	7035[1]			**2203328**	**2203331**	**1019749[2]**					
	7035[1]			**1019724[2]**							
	9005[1]			**2203329**	**2203330**	**1019720**					
	9005[1]			**1019723[2]**							
Raspberry Pi, 4B	7035[1]			**1139227[2]**		**1139240[2]**					
	9005[1]			**1139237[2]**		**1139242[2]**					
Raspberry Pi, 2B + 3B, for Raspberry Pi 7" touch display	7035[1]									**1104780[2]**	
	9005[1]									**1104781[2]**	
ETX	7035[1]					**2203332**	**2203334**				
	9005[1]					**2203333**	**2203335**				
PC/104	7035[1]					**2203332**	**2203334**				
	9005[1]					**2203333**	**2203335**				
Pico ITX	7035[1]					**2203332**	**2203334**				
	9005[1]					**2203333**	**2203335**				
EPIC	7035[1]							**2203336**	**2203338**		
	9005[1]							**2203337**	**2203340**		
Nano ITX	7035[1]							**2203336**	**2203338**		
	9005[1]							**2203337**	**2203340**		
Mini DTX	7035[1]									**2203341**	**2203344**
	9005[1]									**2203342**	**2203345**
Mini ITX	7035[1]									**2203341**	**2203344**
	9005[1]									**2203342**	**2203345**
EBX	7035[1]									**2203341**	**2203344**
	9005[1]									**2203342**	**2203345**
Complete set with PCB mounting, fixed for maximum PCB dimensions											
211.8 mm x 169.8 mm	7035[1]									**2203455**	**2203457**
211.8 mm x 169.8 mm	9005[1]									**2203456**	**2203458**
169.8 mm x 120 mm	7035[1]							**2203453**	**2203454**		
169.8 mm x 120 mm	9005[1]							**2203441**	**2203442**		
120 mm x 100 mm	7035[1]					**2203447**	**2203450**				
120 mm x 100 mm	9005[1]					**2203448**	**2203451**				
100 mm x 62 mm	7035[1]			**2203443**	**2203445**						
100 mm x 62 mm	9005[1]			**2203444**	**2203446**						
62 mm x 62 mm	7035[1]	**1349243**	**1349251**								
62 mm x 62 mm	9005[1]	**1349249**	**1349254**								

[1] Color similar to the specified RAL color

[2] Side panels with openings for all relevant connections

3.3 Product list of accessories for assembly

		UCS 87-87...		UCS 125-87...		UCS 145-125...		UCS 195 -145...		UCS 237 -195...	
	RAL	47 mm	67 mm	47 mm	67 mm	47 mm	67 mm	47 mm	67 mm	47 mm	67 mm
Wall bracket[1]											
UCS WM-B 7035	7035[2]	**2203718**	**2203718**	**2203718**	**2203718**	**2203718**	**2203718**	**2203718**	**2203718**	**2203718**	**2203718**
UCS WM-B 9005	9005[2]	**2203719**	**2203719**	**2203719**	**2203719**	**2203719**	**2203719**	**2203719**	**2203719**	**2203719**	**2203719**
UCS WM-B 5018	5018[2]	**2203391**	**2203391**	**2203391**	**2203391**	**2203391**	**2203391**	**2203391**	**2203391**	**2203391**	**2203391**
Stand											
UCS PED 7035	7035[2]	**2203392**		**2203392**		**2203392**		**2203392**		**2203392**	
UCS PED 9005	9005[2]	**2203393**		**2203393**		**2203393**		**2203393**		**2203393**	
UCS PED 5018	5018[2]	**2203394**		**2203394**		**2203394**		**2203394**		**2203394**	
Corner guards											
UCS CP 7035	7035[2]	**2203346**	**2203346**	**2203346**	**2203346**	**2203346**	**2203346**	**2203346**	**2203346**	**2203346**	**2203346**
UCS CP 9005	9005[2]	**2203347**	**2203347**	**2203347**	**2203347**	**2203347**	**2203347**	**2203347**	**2203347**	**2203347**	**2203347**
UCS CP 5018	5018[2]	**2203348**	**2203348**	**2203348**	**2203348**	**2203348**	**2203348**	**2203348**	**2203348**	**2203348**	**2203348**
Stacking adapter											
UCS CS 7035	7035[2]	**2203720**	**2203720**	**2203720**	**2203720**	**2203720**	**2203720**	**2203720**	**2203720**	**2203720**	**2203720**
UCS CS 9005	9005[2]	**2203721**	**2203721**	**2203721**	**2203721**	**2203721**	**2203721**	**2203721**	**2203721**	**2203721**	**2203721**
UCS CS 5018	5018[2]	**1029039**	**1029039**	**1029039**	**1029039**	**1029039**	**1029039**	**1029039**	**1029039**	**1029039**	**1029039**
Mounting panel											
UCS WM-MP 125-87 7035	7035[2]			**1225407**	**1225407**						
UCS WM-MP 145-125 7035						**1225406**	**1225406**				
UCS WM-MP 195-145 7035								**1225405**	**1225405**		
UCS WM-MP 237-195 7035										**1225404**	**1225404**

[1] Only in conjunction with UCS GD 9005

[2] Color similar to the specified RAL color

3.4 Product list of the individual housing parts

UCS HH... housing half shells					Size	...87-87...	...125-87...	...145-125...	...195-145...	...237-195...
					RAL 7035[1]	1290574	2203349	2203351	2203353	2203356
					RAL 9005[1]	1290569	2203350	2203352	2203354	2203357
Custom configuration from single parts										
Side panel	Length	Material		Item						
Flat (47 mm)	87	RAL 7035[1]	PC	UCS SW 87-F 7035	2203358	X	X			
	87	RAL 9005[1]	PC	UCS SW 87-F 9005	2203359	X	X			
	87	Aluminum		UCS SW 87-F AL	2203360	X	X			
	125	RAL 7035[1]	PC	UCS SW 125-F 7035	2203364		X	X		
	125	RAL 9005[1]	PC	UCS SW 125-F 9005	2203365		X	X		
	125	Aluminum		UCS SW 125-F AL	2203366		X	X		
	145	RAL 7035[1]	PC	UCS SW 145-F 7035	2203372			X	X	
	145	RAL 9005[1]	PC	UCS SW 145-F 9005	2203373			X	X	
	145	Aluminum		UCS SW 145-F AL	2203374			X	X	
	195	RAL 7035[1]	PC	UCS SW 195-F 7035	2203378				X	X
	195	RAL 9005[1]	PC	UCS SW 195-F 9005	2203379				X	X
	195	Aluminum		UCS SW 195-F AL	2203380				X	X
	237	RAL 7035[1]	PC	UCS SW 237-F 7035	2203385					X
	237	RAL 9005[1]	PC	UCS SW 237-F 9005	2203386					X
	237	Aluminum		UCS SW 237-F AL	2203387					X
Flat, with heatsink	125	Aluminum		UCS HS-SW 125-F AL	1481699		X	X		
	145	Aluminum		UCS HS-SW 145-F AL	1481701			X	X	
Tall (67 mm)	87	RAL 7035[1]	PC	UCS SW 87-H 7035	2203361	X	X			
	87	RAL 9005[1]	PC	UCS SW 87-H 9005	2203362	X	X			
	87	Aluminum		UCS SW 87-H AL	2203363	X	X			
	125	RAL 7035[1]	PC	UCS SW 125-H 7035	2203367		X	X		
	125	RAL 9005[1]	PC	UCS SW 125-H 9005	2203369		X	X		
	125	Aluminum		UCS SW 125-H AL	2203370		X	X		
	145	RAL 7035[1]	PC	UCS SW 145-H 7035	2203375			X	X	
	145	RAL 9005[1]	PC	UCS SW 145-H 9005	2203376			X	X	
	145	Aluminum		UCS SW 145-H AL	2203377			X	X	
	195	RAL 7035[1]	PC	UCS SW 195-H 7035	2203381				X	X
	195	RAL 9005[1]	PC	UCS SW 195-H 9005	2203382				X	X
	195	Aluminum		UCS SW 195-H AL	2203383				X	X
	237	RAL 7035[1]	PC	UCS SW 237-H 7035	2203388					X
	237	RAL 9005[1]	PC	UCS SW 237-H 9005	2203389					X
	237	Aluminum		UCS SW 237-H AL	2203390					X

[1] Color similar to the specified RAL color

UCS HH... housing half shells		Size	...87-87...	...125-87...	...145-125...	...195-145...	...237-195...
		RAL 7035[1]	1290574	2203349	2203351	2203353	2203356
		RAL 9005[1]	1290569	2203350	2203352	2203354	2203357
Custom configuration from single parts							
Height adapter, required in conjunction with tall side panels, four pieces incl. four longer screws							
RAL 7035[1]	UCS HAC 7035	2203399	X	X	X	X	X
RAL 9005[1]	UCS HAC 9005	2203400	X	X	X	X	X
Corner inlays, 4 pieces in a PE bag							
RAL 7035[1]	UCS CC 7035	2203395	X	X	X	X	X
RAL 9005[1]	UCS CC 9005	2203396	X	X	X	X	X
RAL 1018[1]	UCS CC 1018	1222463	X	X	X	X	X
RAL 2003[1]	UCS CC 2003	1222468	X	X	X	X	X
RAL 3001[1]	UCS CC 3001	1222470	X	X	X	X	X
RAL 5010[1]	UCS CC 5010	1222467	X	X	X	X	X
RAL 5015[1]	UCS CC 5015	1222469	X	X	X	X	X
RAL 5018[1]	UCS CC 5018	2203398	X	X	X	X	X
Corner inlays, with screw boss, incl. four screws for PCB mounting, 4 pieces							
RAL 7035[1]	UCS CCD 7035	2203479	X	X	X	X	X
RAL 9005[1]	UCS CCD 9005	2203477	X	X	X	X	X
RAL 1018[1]	UCS CCD 1018	1222532	X	X	X	X	X
RAL 2003[1]	UCS CCD 2003	1222461	X	X	X	X	X
RAL 3001[1]	UCS CCD 3001	1222462	X	X	X	X	X
RAL 5010[1]	UCS CCD 5010	1222459	X	X	X	X	X
RAL 5015[1]	UCS CCD 5015	1056065	X	X	X	X	X
RAL 5018[1]	UCS CCD 5018	2203404	X	X	X	X	X
DIN rail adapter, for mounting on an NS 35 DIN rail							
RAL 7035[1]	UCS DIN 125-F 7035	2203838		X	X		
RAL 7035[1]	UCS DIN 125-H 7035	2203841		X	X		
RAL 7035[1]	UCS DIN 145-F 7035	2203839			X	X	
RAL 7035[1]	UCS DIN 145-H 7035	2203840			X	X	
RAL 9005[1]	UCS DIN 125-F 9005	1174338		X	X		
RAL 9005[1]	UCS DIN 125-H 9005	1174345		X	X		
RAL 9005[1]	UCS DIN 145-F 9005	1174341			X	X	
RAL 9005[1]	UCS DIN 145-H 9005	1174406			X	X	
Screw set, for housing half shells, 4 pieces							
Flat (47 mm)	UCS SF 3,5X20	2203402	X	X	X	X	X
Tall (67 mm)	UCS SF 3,5X40	2203403	X	X	X	X	X
Adhesive pads, incl. screws for PCB mounting, 4 pieces							
RAL 9005[1]	UCS GD 9005	2203401	X	X	X	X	X

[1] Color similar to the specified RAL color

3.5 Product list of housings with heatsinks

			...87-87...	...125-87...	...145-125...	...195-145...	...237-195...
Housing half shell, prepared to accommodate a heatsink							
RAL 7035[1]	UCS HH-HS 125-87 7035	1494976		X			
RAL 9005[1]	UCS HH-HS 125-87 9005	1494977		X			
RAL 7035[1]	UCS HH-HS 145-125 7035	1494978			X		
RAL 9005[1]	UCS HH-HS 145-125 9005	1494981			X		
Housing half shell, with heatsink and heat spreader							
RAL 7035[1]	UCS HH-HSAS1 125-87 7035	1481707		X			
RAL 9005[1]	UCS HH-HSAS2 145-125 9005	1481709			X		
Side panel, with heatsink							
Aluminum	UCS HS-SW 125-F AL	1481699		X	X		
Aluminum	UCS HS-SW 145-F AL	1481701			X	X	
Heatsink, with 4 M3X8-T screws							
	UCS HS-HH 125-87 AL	1481697		X	X	X	X
	UCS HS-HH 145-125 AL	1481698			X	X	X
Heat spreader, with 4 M3X5-T screws							
	UCS HSP 22-25 AL	1481702		X	X	X	X
	UCS HSP 50-25 AL	1481703		X	X	X	X
Spacing bolts, with screw							
	UCS SB M2,5X5	1494983		X	X	X	X
	UCS SB M2,5X10	1494984		X	X	X	X
	UCS SB M2,5X15	1494989		X	X	X	X
	UCS SB M2,5X20	1494990		X	X	X	X
	UCS SB M2,5X25	1494992		X	X	X	X
Screw, for spacing bolts and screwing the PCB to the side panel heatsink							
	UCS SHS M2,5X4	1495002		X	X	X	X

[1] Color similar to the specified RAL color

4 Technical data

Housing design	
Insulation material	
Side panels (UCS HH..., UCS SW..., UCS DIN...; UCS WM-MP...)	Polycarbonate PC
Fixing elements (UCS CC..., UCS GD..., UCS WM-B..., UCS PED...)	Polyamide PA
Corner guards and stacking adapters (UCS CS..., UCS CP...)	TPE-U
Flammability rating in accordance with UL 94	
Polycarbonate PC, polyamide PA	V0
TPE-U	V2
Degree of protection in accordance with DIN EN 60259	IP40

Power dissipation							
Heatsink	Housing size [mm]	Hotspot [mm]	ΔT				
			0 K	5 K	10 K	20 K	30 K	100 K
HS-HH 125-87	125 x 87	20 x 20	0.00 W	0.92 W	1.98 W	4.23 W	6.57 W	23.77 W
HS-HH 145-125	145 x 125		0.00 W	1.33 W	2.84 W	6.09 W	9.47 W	34.37 W
HS-SW F 125	125 x 87		0.00 W	0.87 W	1.85 W	3.98 W	6.22 W	22.86 W
HS-SW F 145	145 x 125		0.00 W	1.10 W	2.31 W	4.93 W	7.69 W	28.12 W
HS-HH 125-87	–		0.00 W	0.99 W	2.15 W	4.65 W	7.27 W	26.79 W
HS-HH 145-125	–		0.00 W	1.45 W	3.12 W	6.69 W	10.42 W	37.51 W
HS-SW F 125	–		0.00 W	0.85 W	1.85 W	4.07 W	6.44 W	24.44 W
HS-SW F 145	–		0.00 W	0.98 W	2.12 W	4.64 W	7.34 W	27.73 W

Housing size	Hotspot	ΔT							ΔT					
		0 K	5 K	10 K	20 K	30 K	100 K	Hotspot	0 K	5 K	10 K	20 K	30 K	100 K
[mm]	[mm]	[W]						[mm]	[W]					
Side panel material: PC														
Flat														
87x87	**20x20**	0.00	0.26	0.52	1.04	1.54	4.83	**60x40**	0.00	0.38	0.77	1.54	2.30	7.25
125x87	**20x20**	0.00	0.31	0.61	1.22	1.81	5.64	**80x60**	0.00	0.58	1.17	2.33	3.48	10.91
145x125	**20x20**	0.00	0.37	0.73	1.46	2.17	6.71	**100x90**	0.00	0.99	1.99	3.97	5.91	18.21
195x145	**20x20**	0.00	0.40	0.81	1.61	2.40	7.49	**150x120**	0.00	1.63	3.28	6.52	9.68	29.54
237x195	**20x20**	0.00	0.43	0.85	1.70	2.54	8.03	**190x170**	0.00	2.68	5.37	10.66	15.80	47.53
Tall														
87x87	**20x20**	0.00	0.28	0.56	1.11	1.65	5.11	**60x40**	0.00	0.42	0.85	1.70	2.54	7.94
125x87	**20x20**	0.00	0.32	0.64	1.27	1.88	5.84	**80x60**	0.00	0.64	1.28	2.56	3.81	11.84
145x125	**20x20**	0.00	0.37	0.74	1.47	2.19	6.80	**100x90**	0.00	1.09	2.18	4.33	6.44	19.78
195x145	**20x20**	0.00	0.41	0.82	1.63	2.43	7.61	**150x120**	0.00	1.72	3.45	6.88	10.22	31.29
237x195	**20x20**	0.00	0.43	0.86	1.72	2.57	8.12	**190x170**	0.00	2.84	5.69	11.29	16.73	50.45
Side panel material: AL														
Flat														
87x87	**20x20**	0.00	0.28	0.55	1.09	1.63	5.12	**60x40**	0.00	0.42	0.85	1.71	2.55	8.09
125x87	**20x20**	0.00	0.32	0.64	1.28	1.91	6.01	**80x60**	0.00	0.68	1.36	2.73	3.99	12.97
145x125	**20x20**	0.00	0.37	0.74	1.48	2.20	6.83	**100x90**	0.00	1.05	2.11	4.21	6.26	19.40
195x145	**20x20**	0.00	0.41	0.81	1.62	2.42	7.57	**150x120**	0.00	1.75	3.52	7.01	10.41	31.99
237x195	**20x20**	0.00	0.43	0.86	1.71	2.55	8.06	**190x170**	0.00	2.84	5.68	11.28	16.72	50.54
Tall														
87x87	**20x20**	0.00	0.30	0.59	1.18	1.75	5.49	**60x40**	0.00	0.48	0.96	1.92	2.87	9.03
125x87	**20x20**	0.00	0.33	0.66	1.32	1.96	6.14	**80x60**	0.00	0.71	1.43	2.86	4.27	13.37
145x125	**20x20**	0.00	0.38	0.75	1.49	2.23	6.95	**100x90**	0.00	1.17	2.34	4.67	6.94	21.46
195x145	**20x20**	0.00	0.41	0.83	1.65	2.45	7.72	**150x120**	0.00	1.87	3.75	7.46	11.09	34.07
237x195	**20x20**	0.00	0.43	0.86	1.73	2.58	8.16	**190x170**	0.00	3.01	6.04	11.99	17.78	53.88
Power dissipation of a PCB with hotspot (without taking a housing into account)														
87x87	**20x20**	0.00	0.31	0.64	1.30	1.95	6.36	**60x40**	0.00	0.52	1.07	2.21	3.38	11.41
125x87	**20x20**	0.00	0.36	0.73	1.47	2.20	7.16	**80x60**	0.00	0.84	1.74	3.61	5.52	18.77
145x125	**20x20**	0.00	0.41	0.82	1.65	2.47	7.95	**100x90**	0.00	1.53	3.16	6.49	9.85	32.81
195x145	**20x20**	0.00	0.42	0.85	1.70	2.55	8.25	**150x120**	0.00	2.58	5.32	10.92	16.58	55.00

Temperature range	
Ambient temperature	
Storage/transport	-40°C ... +55°C (80% relative humidity)
Mounting	-5°C ... +100°C
Operation	-40°C ... +100°C (depending on power dissipation)
Storage temperature for heatsink products (heat spreader and half shells with heat spreader)	-10°C ... +35°C Optimum: +21°C ... +29°C (50% relative humidity) Storage temperature is limited due to previously applied screw locking mechanism

Mounting the housing	Housing	PCB
Tightening torque	1.2 Nm ... 1.4 Nm	0.4 Nm ... 0.5 Nm
Speed	500 rpm ... 1000 rpm	500 rpm ... 1000 rpm
Bit	T10	T7

Mounting the heatsinks	M3 (scope of supply)	M2.5 (accessories)
Application	Screw heatsink into half shell (M3X8-T, DIN 34805-2) Screw the heat spreader onto the heatsink (M3X5-T, ISO 14581)	Screw the PCB onto the spacing bolt or side panel heatsink (UCS SHS M2,5X4, 1495002)
Tightening torque	0.8 Nm ... 1.0 Nm	0.5 Nm ... 0.6 Nm
Bit	T10	T8

PCB mounting	
Attaching the UCS GD... adhesive pads	
Temperature range	+18°C ... +30°C
Press-down force/press-down time	60 N/3 s
PCB surface, maximum per PCB, single side	3700 mm² ... 35800 mm²
PCB thickness	0.8 mm ... 3 mm
PCB thickness when using heatsinks	1.4 mm ... 1.8 mm[1]

[1] When using the UCS SHS M2,5X4 screw, 1495002. Other PCB thicknesses are possible if another screw is used.

Mounting, maximum weight	UCS DIN...	UCS PED...	UCS WM-B... UCS WM-MP...
UCS 87-87...	–	0.5 kg	0.5 kg
UCS 125-87...	0.6 kg	0.6 kg	0.6 kg
UCS 145-125...	0.9 kg	0.9 kg	0.9 kg
UCS 195-145...	1.15 kg	1.15 kg	1.15 kg
UCS 237-195...	–	1.2 kg	1.2 kg
Recommended screws, for wall mounting	–	Ø 4 mm, S5 dowel	Ø 4 mm, S5 dowel

Tests[1]	
Vibration test[2]	DIN EN 60068-2-6:2008-10
Shocks[2]	DIN EN 60068-2-27:2010-02
Thermal stability (ball thrust test)	DIN EN 60695-10-2:2016-01
Test for assessing the risk of fire (glow wire)	DIN EN 60695-2-11:2014-11
Test for substances that would hinder coating with paint or varnish	VW PV 3.10.7:2005-02

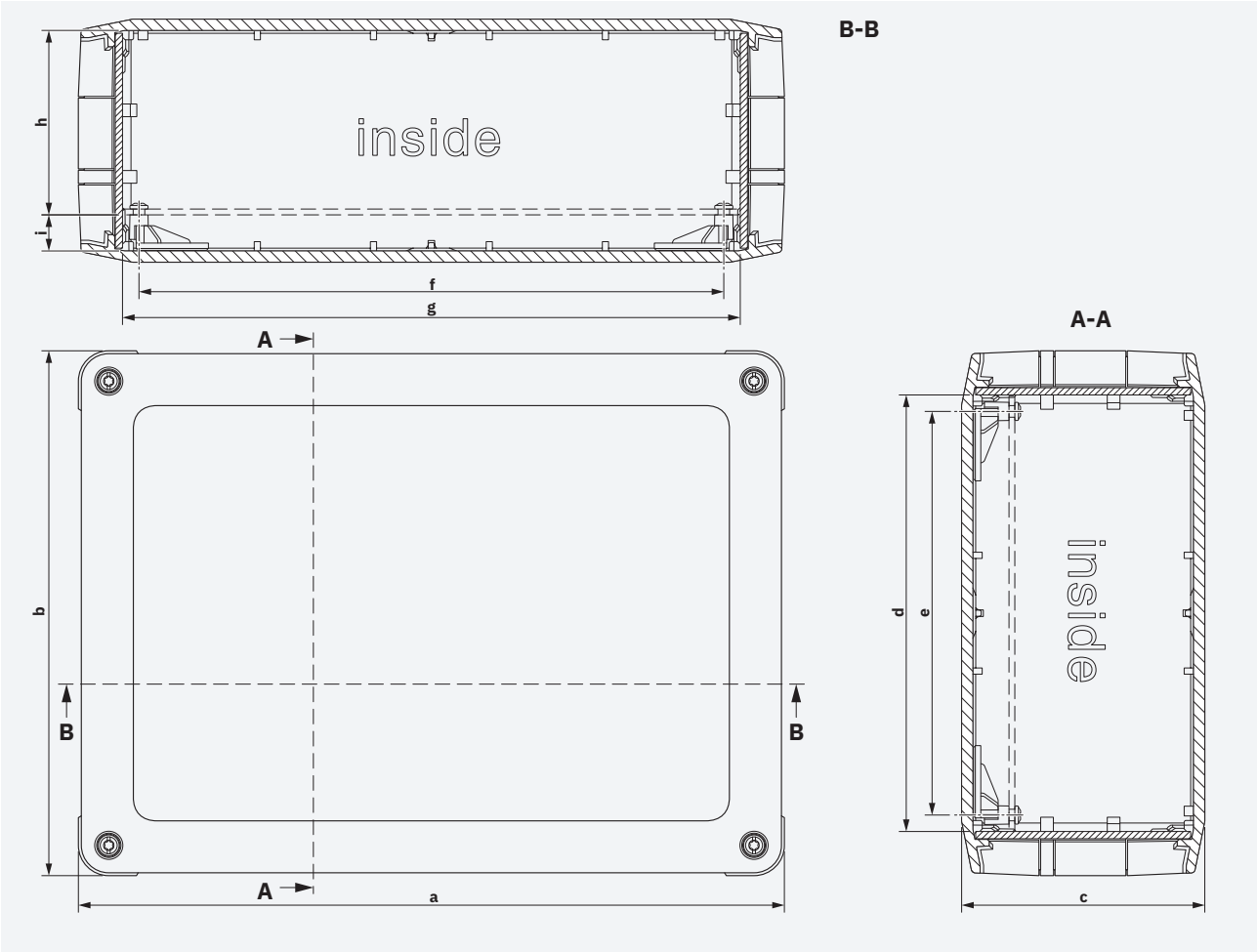
[1] Detailed information can be found in the data sheets for the relevant product.

[2] Additional storage over 1000 h at +85°C/85% relative humidity, to test the holding force of UCS GD... adhesive pads

5 Housing dimensions

5.1 External and inner dimensions

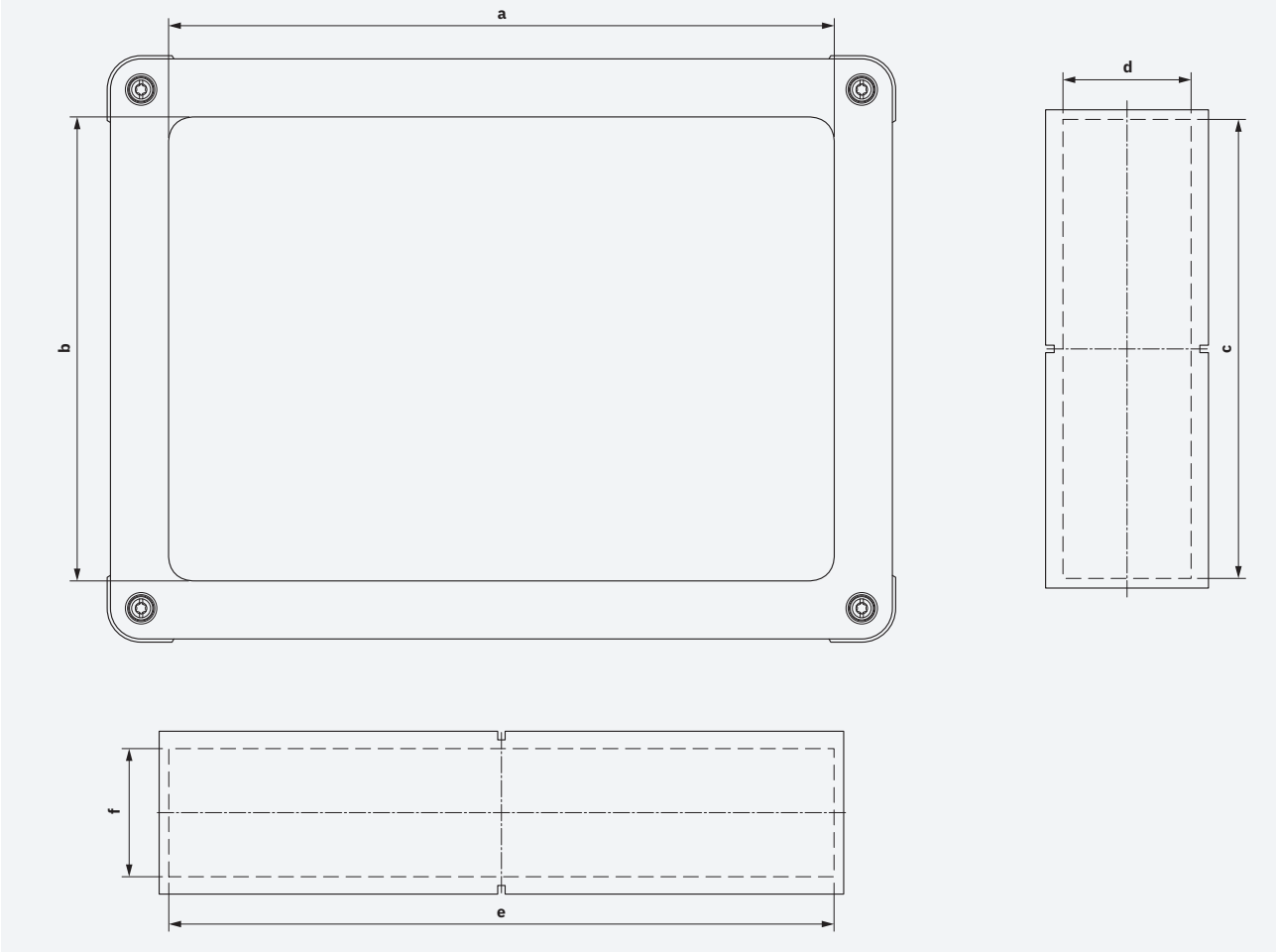
Figure 3 Housing dimensions



External dimensions			Inner dimensions					
			Narrow side		Wide side		Height	
a	b	c	d	e	f	g	h	i
87 mm	87 mm	47 mm	62.7 mm	≤57 mm	62.7 mm	≤57 mm	31 mm	10 mm
87 mm	87 mm	67 mm	62.7 mm	≤57 mm	62.7 mm	≤57 mm	51 mm	10 mm
125 mm	87 mm	47 mm	62.7 mm	≤57 mm	≤95 mm	100.7 mm	31 mm	10 mm
125 mm	87 mm	67 mm	62.7 mm	≤57 mm	≤95 mm	100.7 mm	51 mm	10 mm
145 mm	125 mm	47 mm	100.7 mm	≤95 mm	≤115 mm	120.7 mm	31 mm	10 mm
145 mm	125 mm	67 mm	100.7 mm	≤95 mm	≤115 mm	120.7 mm	51 mm	10 mm
195 mm	145 mm	47 mm	120.7 mm	≤115 mm	≤165 mm	170.7 mm	31 mm	10 mm
195 mm	145 mm	67 mm	120.7 mm	≤115 mm	≤165 mm	170.7 mm	51 mm	10 mm
237 mm	195 mm	47 mm	170.7 mm	≤163.2 mm	≤205 mm	212.7 mm	31 mm	10 mm
237 mm	195 mm	67 mm	170.7 mm	≤163.2 mm	≤205 mm	212.7 mm	51 mm	10 mm

5.2 Space for printing

Figure 4 Maximum space for printing

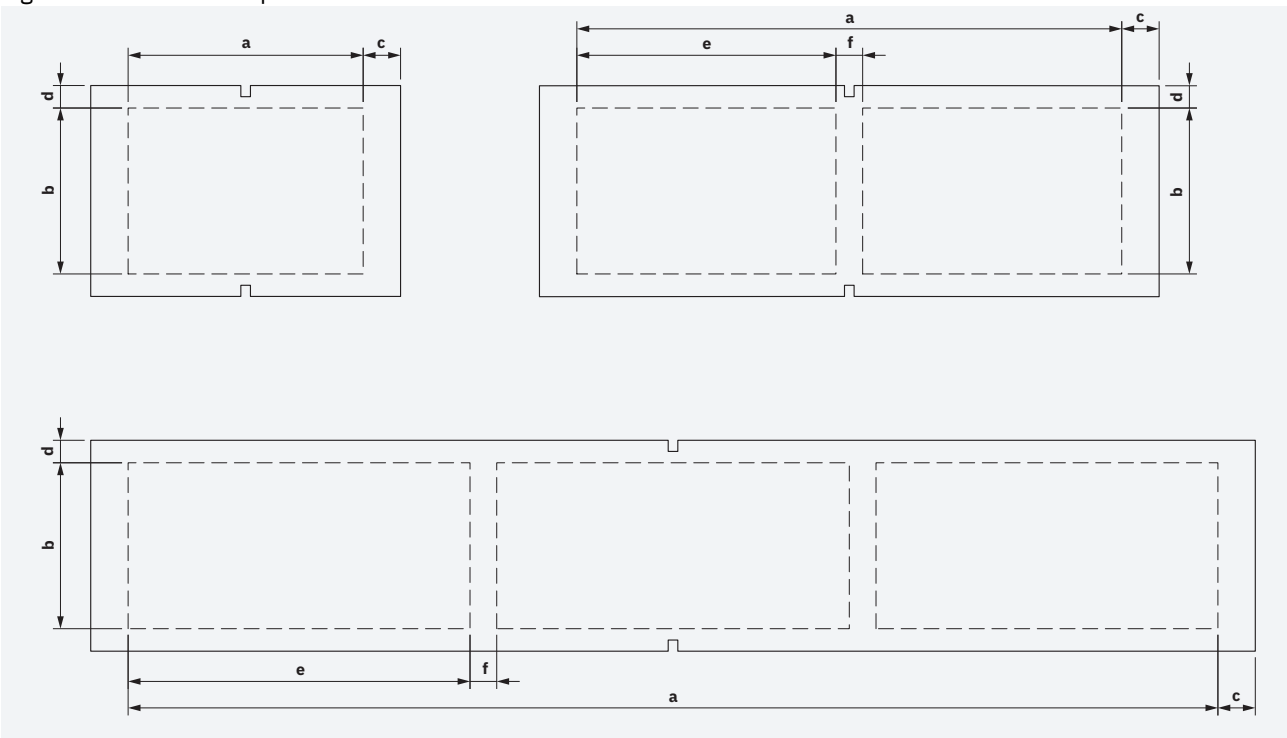


The maximum amount of space available for printing is as follows.

External dimensions			Space for printing					
			Top		Narrow side		Wide side	
			a	b	c	d	e	f
87 mm	87 mm	47 mm	56.8 mm	56.8 mm	53.3 mm	31.1 mm	53.3 mm	31.1 mm
87 mm	87 mm	67 mm	56.8 mm	56.8 mm	53.3 mm	50.6 mm	53.3 mm	50.6 mm
125 mm	87 mm	47 mm	94.8 mm	56.8 mm	53.3 mm	31.1 mm	91.3 mm	31.1 mm
125 mm	87 mm	67 mm	94.8 mm	56.8 mm	53.3 mm	50.6 mm	91.3 mm	50.6 mm
145 mm	125 mm	47 mm	114.8 mm	94.8 mm	91.3 mm	31.1 mm	111.3 mm	31.1 mm
145 mm	125 mm	67 mm	114.8 mm	94.8 mm	91.3 mm	50.6 mm	111.3 mm	50.6 mm
195 mm	145 mm	47 mm	164.8 mm	114.8 mm	111.3 mm	31.1 mm	161.3 mm	31.1 mm
195 mm	145 mm	67 mm	164.8 mm	114.8 mm	111.3 mm	50.6 mm	161.3 mm	50.6 mm
237 mm	195 mm	47 mm	206.8 mm	164.8 mm	161.3 mm	31.1 mm	202.4 mm	31.1 mm
237 mm	195 mm	67 mm	206.8 mm	164.8 mm	161.3 mm	50.6 mm	202.4 mm	50.6 mm

5.3 Space for cutouts

Figure 5 Maximum space for cutouts



In order to absorb the forces produced during milling, segments must be provided for cutouts. When the cutout length is reduced significantly, the outer and middle segments can be made thinner. This applies to all side panel variants (UCS SW... and UCS SW...AL).

Housing side dimensions		Space for recesses		Minimum width of outer segment		Maximum length of cutout	Minimum width of middle segment	Number of middle segments
		a	b	c	d	e	f	
87 mm	47 mm	44 mm	31.1 mm	7 mm	4.2 mm	–	–	–
125 mm	47 mm	82 mm	31.1 mm	7 mm	4.2 mm	–	–	–
145 mm	47 mm	102 mm	31.1 mm	7 mm	4.2 mm	70 mm	5 mm	1
195 mm	47 mm	152 mm	31.1 mm	7 mm	4.2 mm	73.5 mm	5 mm	1
237 mm	47 mm	194 mm	31.1 mm	7 mm	4.2 mm	70 mm	5 mm	2
87 mm	67 mm	38 mm	39.4 mm	10 mm	10 mm	–	–	–
125 mm	67 mm	76 mm	39.4 mm	10 mm	10 mm	–	–	–
145 mm	67 mm	96 mm	39.4 mm	10 mm	10 mm	70 mm	10 mm	1
195 mm	67 mm	146 mm	39.4 mm	10 mm	10 mm	70 mm	10 mm	1
237 mm	67 mm	188 mm	39.4 mm	10 mm	10 mm	70 mm	10 mm	2

5.4 PCB dimensions

Figure 6 Maximum assembly area

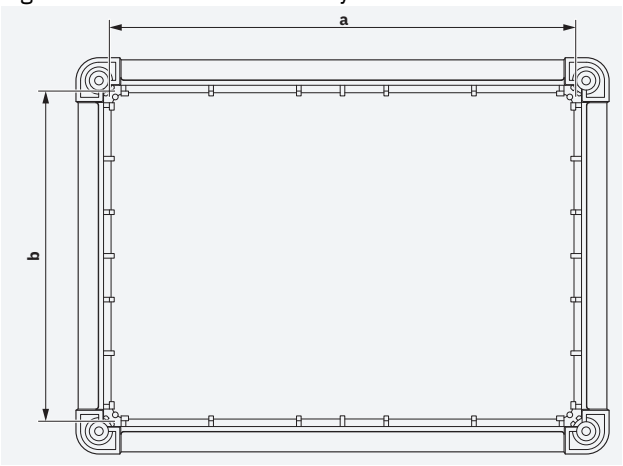
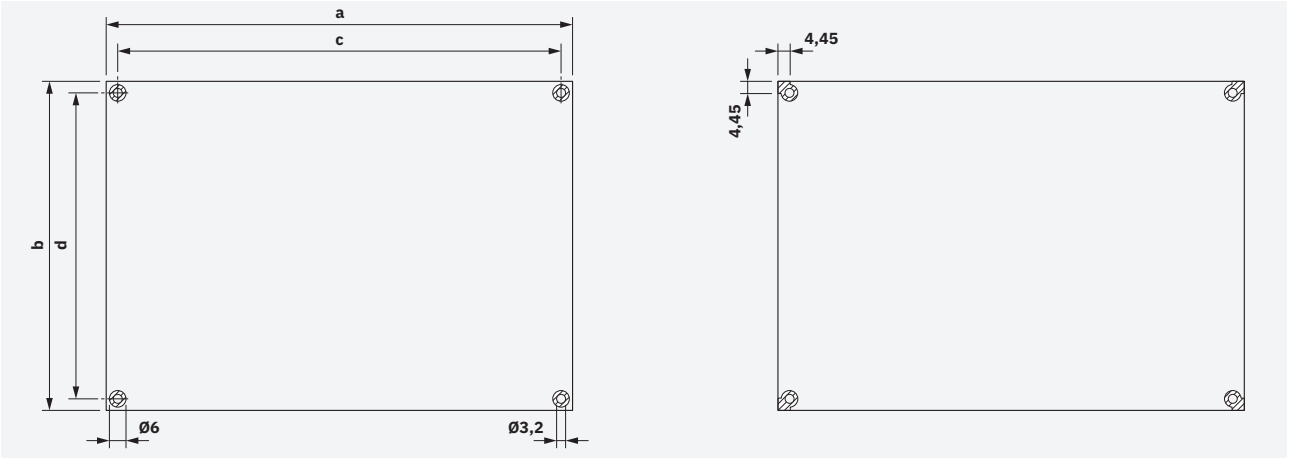


Figure 7 Maximum PCB dimensions (for housings without heatsinks)



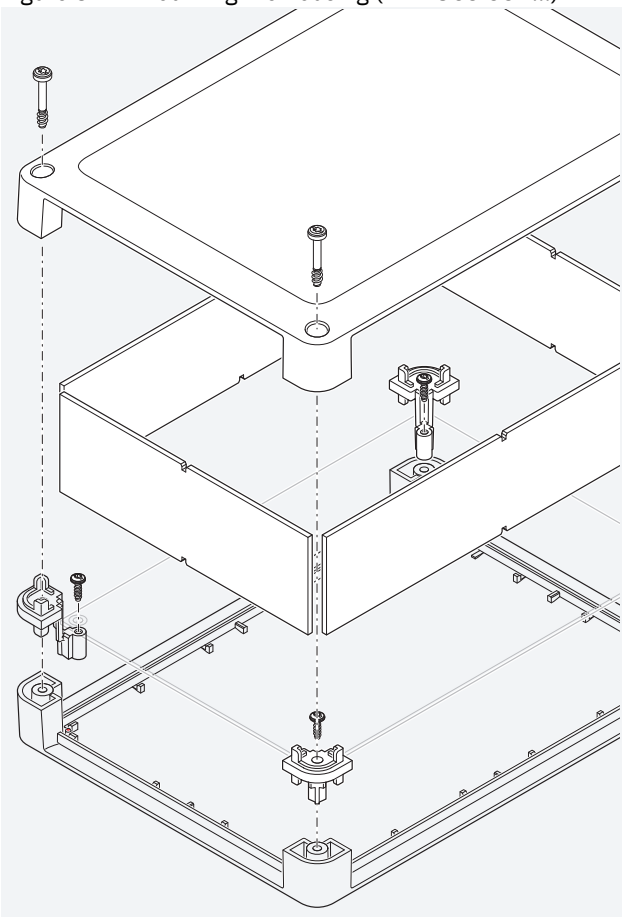
For housings		Maximum assembly area			Distance between fixing holes[1]		PCB thickness
		a	b		c	d	
For housings without heatsinks							
87	87	62 mm	62 mm	3700 mm²	53.6 mm	53.6 mm	0.8 mm … 3 mm
125	87	100 mm	62 mm	6000 mm²	91.6 mm	53.6 mm	0.8 mm … 3 mm
145	125	120 mm	100 mm	11800 mm²	111.6 mm	91.6 mm	0.8 mm … 3 mm
195	145	170 mm	120 mm	20200 mm²	161.6 mm	111.6 mm	0.8 mm … 3 mm
237	195	212 mm	170 mm	35800 mm²	203.6 mm	161.6 mm	0.8 mm … 3 mm
For housings with heatsinks							
125	87	99 mm	61 mm	5800 mm²	89.6 mm	51.6 mm	1.4 mm … 1.8 mm
145	125	119 mm	99 mm	11600 mm²	109.6 mm	89.6 mm	1.4 mm … 1.8 mm
195	145	169 mm	119 mm	19900 mm²	159.6 mm	109.6 mm	1.4 mm … 1.8 mm
237	195	211 mm	169 mm	35400 mm²	201.6 mm	159.6 mm	1.4 mm … 1.8 mm

[1] When using these screws to secure the PCB: UCS SHS M2,5X4, 1495002

6 Mounting the housing

6.1 Mounting PCBs

Figure 8 Mounting the housing (with UCS CCD...)



- Insert the four corner inlays into the lower part of the housing half shells.
  - Corner inlays with screw boss for PCB mounting (UCS CCD...)
  - Corner inlays without screw boss for PCB mounting (UCS CC...)
- Insert the side panels and the PCBs. The sequence depends on how the connections are routed outwards.

  The inside of the side panels is marked “Inside”.
- Screw the PCBs into the UCS CCD... corner inlays or into the UCS GD adhesive pads with 0.4 Nm ... 0.5 Nm. Only use the T7 Torx screws provided for this. We recommend a torque screwdriver with a T7 bit (500 rpm ... 1000 rpm).

6.2 Screwing on the housing

Use the self-tapping T10 Torx screws provided to attach the housing. We recommend a torque screwdriver with a T10 bit (500 rpm ... 1000 rpm).

The screws are designed in such a way that they cannot be lost when the cover is released.

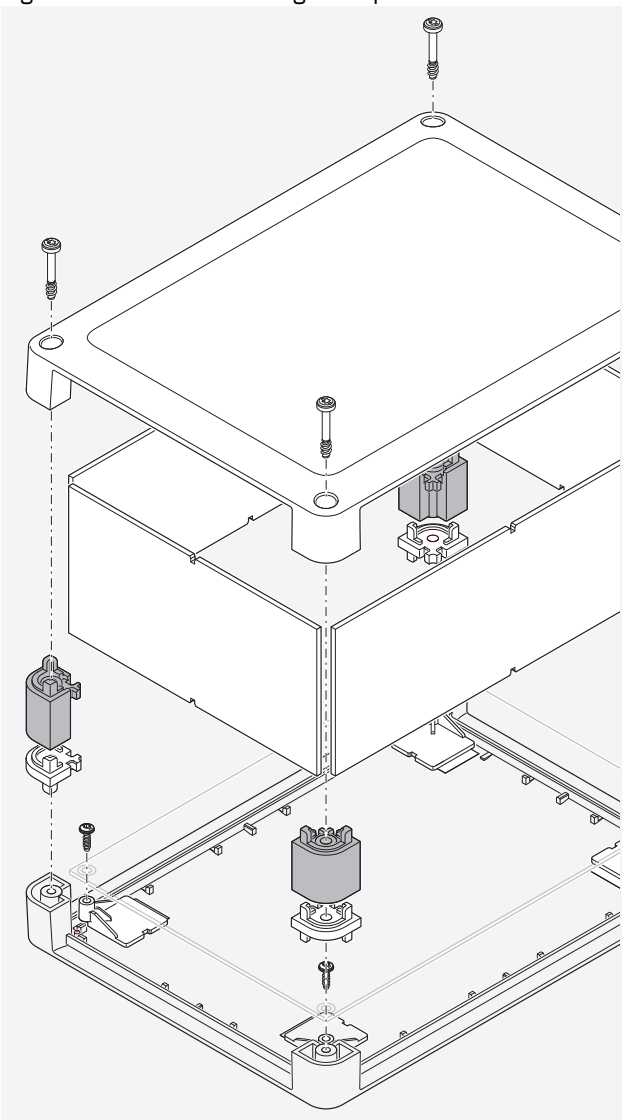
NOTE:

The housing can be opened a maximum of 10 times.

- Tighten the upper part of the housing half shells to 1.2 Nm ... 1.4 Nm.

6.3 Inserting the height adapter

Figure 9 UCS HAC... height adapter

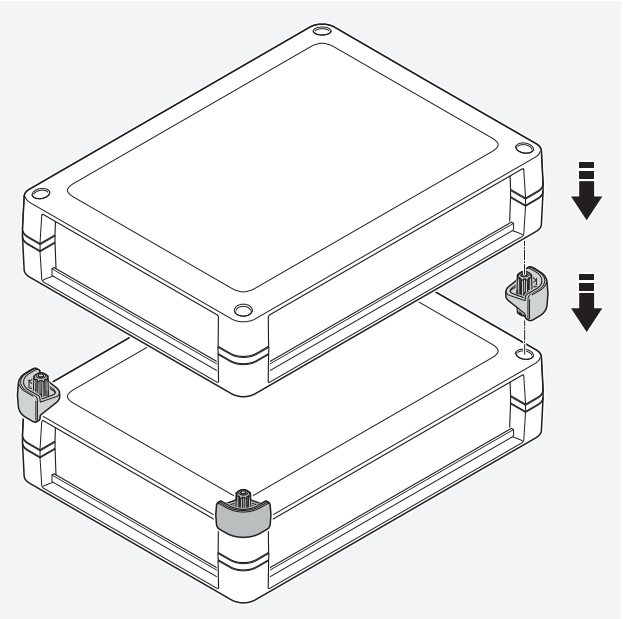


- When using tall housings, insert the UCS HAC... height adapter in the correct direction.
  The pins must point upwards.

6.4 Stacking adapter

You can connect two housings using the UCS CS... stacking adapter.

Figure 10 Mounting the UCS CS... stacking adapter

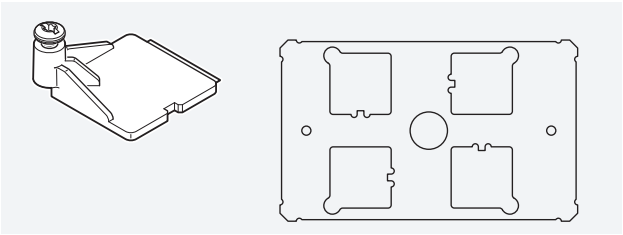


- Snap the stacking adapter into the screw holes in the housing.

When UCS CS... stacking adapters and UCS CP... corner guards are used, flammability rating in accordance with UL 94 is reduced to V2.

6.5 Attaching the adhesive pads

Figure 11 UCS GD... adhesive pad with adhesive template



- Make sure that the surface of the housing is clean, dry, and free from grease.
  Temperature range: +18°C ... +30°C
- Attach the UCS GD... adhesive pads to the housing half shell using the appropriate template.
  – Press-down force: 60 N
  – Press-down time: 3 s

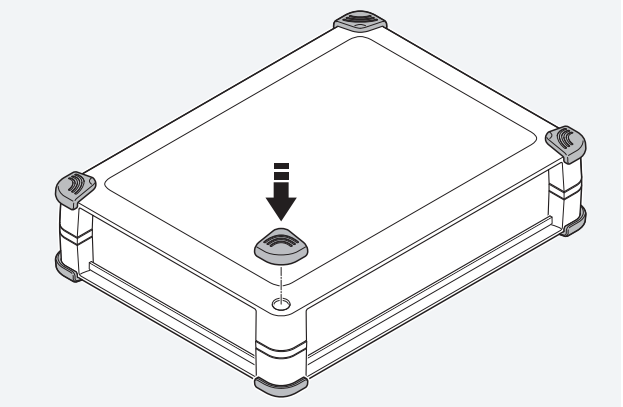
  We can produce adhesive templates for you on request.
  Adhesive templates for PCBs with form factor can be found at phoenixcontact.com/products.

When UCS CS... stacking adapters and UCS CP... corner guards are used, flammability rating in accordance with UL 94 is reduced to V2.

6.6 Mounting the corner guards

UCS CP... corner guards are available for protecting the housing against impact and to provide an anti-slip function.

Figure 12 Mounting the UCS CP... corner guards

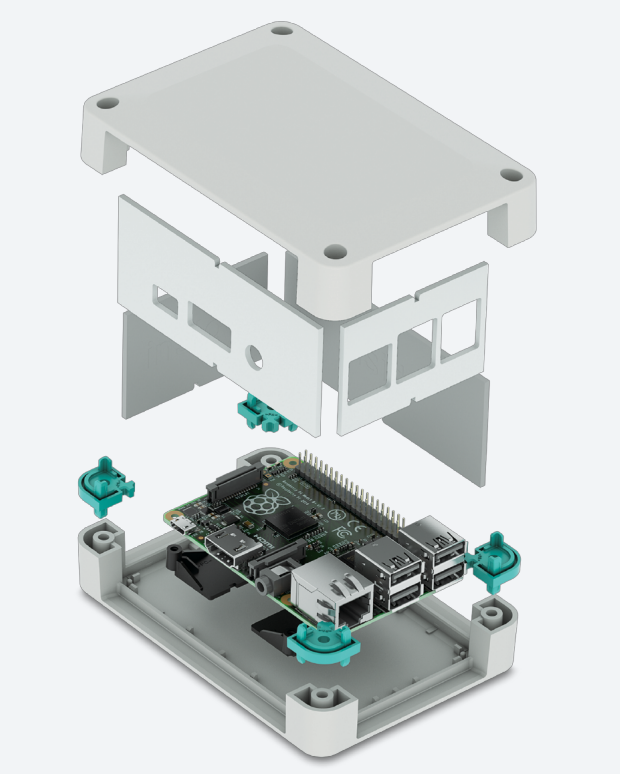


- Snap the corner guards into the screw holes in the housing.

When UCS CS... stacking adapters and UCS CP... corner guards are used, flammability rating in accordance with UL 94 is reduced to V2.

6.7 Mounting the housing with Raspberry Pi

Figure 13 Mounting the housing with Raspberry Pi



Variants with ready-machined side panels are available for the Raspberry Pi single-board computer.

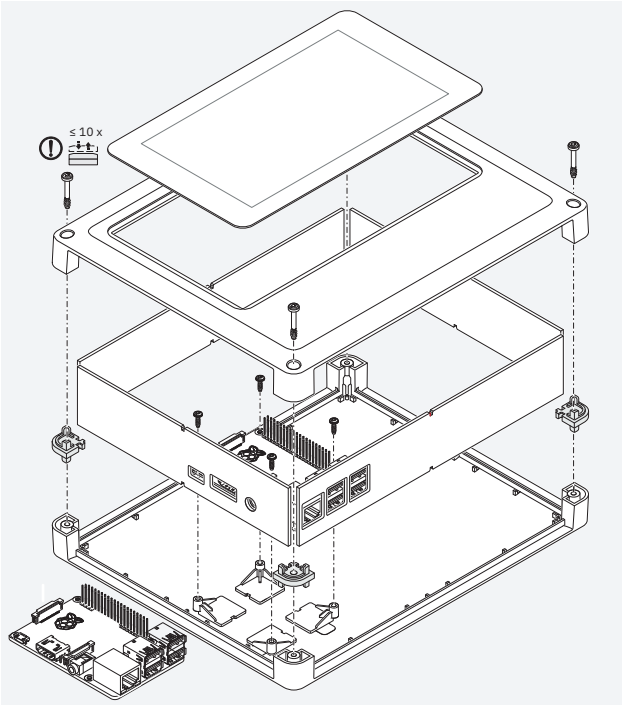
We recommend using the UCS TEMP...RPI B2/3 adhesive template to mount the single-board computer (see “Attaching the adhesive pads” on page 20).

- Position the adhesive pads in a half shell.
- Insert the UCS CC... corner inlays.
- Insert the side panels.
- Secure the single-board computer in place using the screws provided.
- Screw on the upper part of the half shell.

6.8 Integrating the Raspberry Pi 7" touch display

The UCS 237-195-F-GD-RPI-DT7... housings (1104780 and 1104781) have been prepared for installing a Raspberry Pi 7" touch display and a Raspberry Pi 2B or 3B.

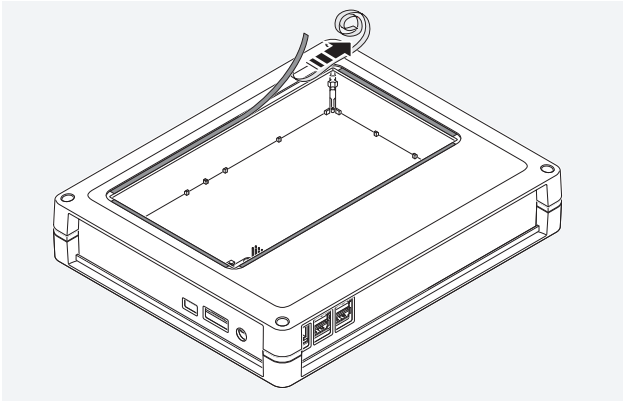
Figure 14 Mounting the housing with Raspberry Pi and touch display



- Insert the four corner inlays into the lower part of the housing half shells (UCS CC...).
- Attach the adhesive pads for a Raspberry Pi 2B or 3B (see “Attaching the adhesive pads” on page 20).
- Insert the side panels. The sequence depends on how the connections are routed outwards. The inside of the side panels is marked “Inside”.
- Screw the PCBs into the UCS GD... adhesive pads with 0.4 Nm ... 0.5 Nm.

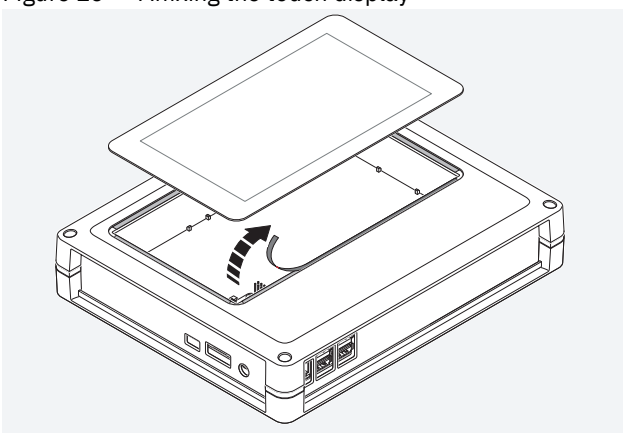
For screwing on the PCBs and the housing half shells, only use the provided T7 Torx screws. We recommend using a torque screwdriver with a T7 bit (500 rpm ... 1000 rpm).

Figure 15 Attaching the adhesive strips



- Remove dirt and dust from the supporting edges for the display.
- Attach the provided adhesive strips in the mounting cutout.

Figure 16 Affixing the touch display



- Remove the protective foil from the upper side of the adhesive strips.
- Insert the Raspberry Pi 7" touch display. Use a cloth to carefully press it down.
  - Ambient temperature: +18°C ... +30°C
  - Press-down force: 60 N
  - Press-down time: 3 s
- Connect the display and the Raspberry Pi.
- Tighten the upper part of the housing half shells to 1.2 Nm ... 1.4 Nm.

NOTE:
The housing can be opened a maximum of 10 times.

6.9 Integrating the 2.4" touch display

For UCS housings, the DCT T 2,4 QVGA S RTOUCH 2.4" touch display (1132710) is available.

2.4" touch display with ST7789V controller, interface: 4-wire SPI half duplex. Further information can be found in the data sheet for the 2.4″ touch display at phoenixcontact.com/qr/1132710.

The 2.4" touch display can be installed in the following housings:

– UCS 125-87-F-... (recommended size)
– UCS 145-125...
– UCS 195-145...
– UCS 237-195...

A complete housing with integrated 2.4" touch display is also available.

– UCS 125-87-F-GD-D2,4-TRG 7035, 1246286
– UCS 125-87-F-GD-D2,4-TRG 9005, 1246287

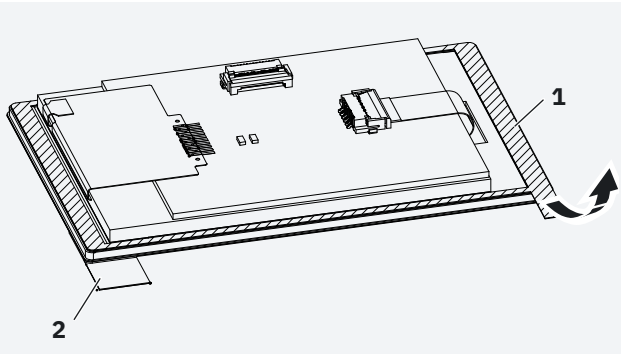
You can position the mounting cutout for the display individually.
For additional information, please contact:
de-housing-service-solutions@phoenixcontact.com.

Further information on displays can be found at phoenixcontact.com, web code: #1639.

Mounting

- Assemble the housing (see “Mounting PCBs” on page 18).
- Screw on the housing (see “Screwing on the housing” on page 18).

Figure 17 Adhesive surface



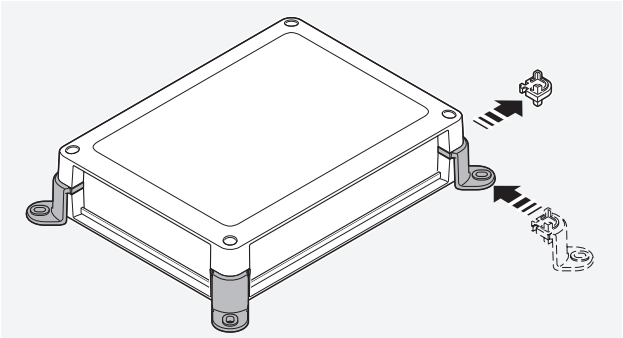
- Remove the foil (1) from the adhesive surface. Leave the protective foil (2) on the display.
- Place the display in the mounting cutout. Press on the adhesive joint.

7 Attaching the housing

7.1 Mounting the housing on a wall

The UCS WM-B... wall bracket is available for wall mounting.

Figure 18 UCS WM-B... wall bracket



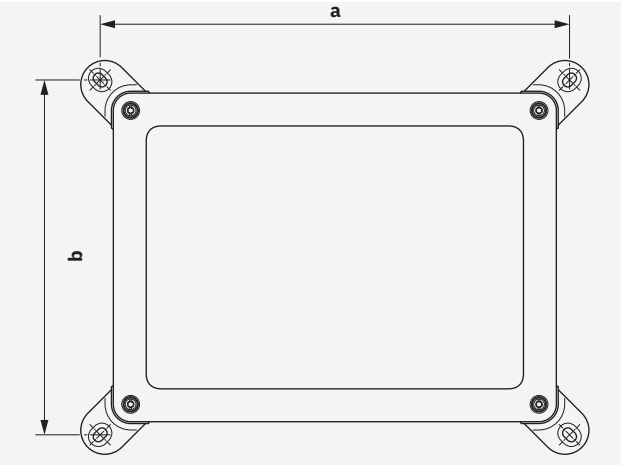
- Replace the corner inlays with corner inlays that have longitudinal holes.

They can only be used in conjunction with UCS GD... adhesive pads.

Recommended screws for wall mounting:
S5 dowel, ø screw 4.0 mm

NOTE:
Observe the maximum permissible total weight (see “Technical data” on page 10).

Figure 19 UCS WM-B... wall bracket, drilling diagram



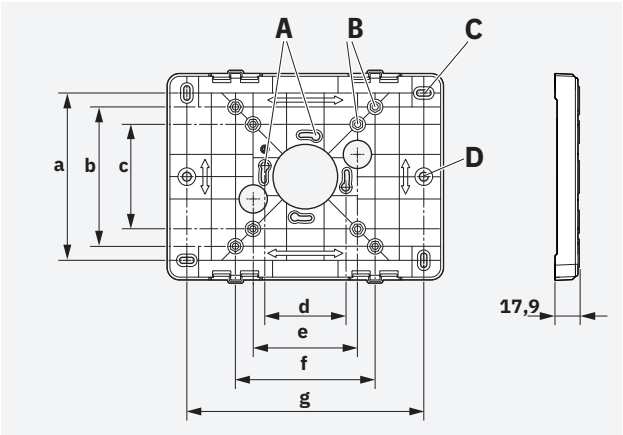
For housings		Drill hole spacing	
		a	b
87	87	97	97
125	87	135	97
145	125	155	135
195	145	205	155
237	195	247	205

7.2 Mounting the housing on a mounting panel

Use the UCS WM-MP... mounting panel to mount the UCS housing on four different surfaces.

- **A** Wall outlet box, diameter: 60 mm
- **B** VESA display mount
- **C** Wall
- **D** Machine profile

Figure 20 UCS WM-MP... mounting panel



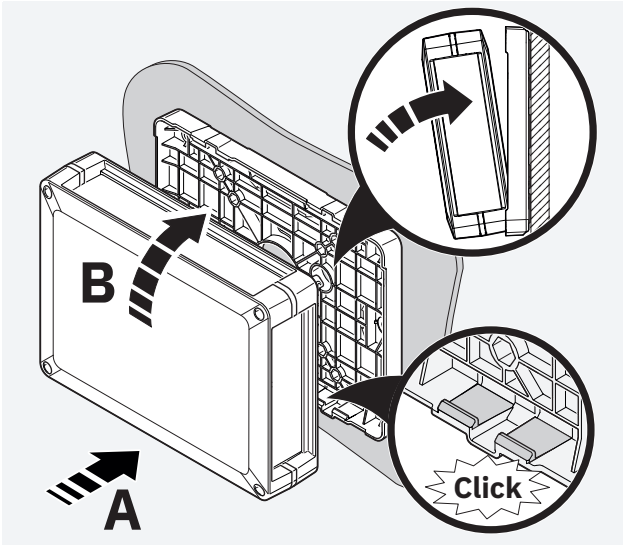
The mounting panel is available in four sizes.

	1104780	1104781	1225406	1225407
a	170 $^{\pm 27}$	120 $^{\pm 27}$	100 $^{\pm 0.24}$	60 $^{\pm 0.18}$
b	100 $^{\pm 0.24}$	100 $^{\pm 0.24}$	100 $^{\pm 0.24}$	–
c	75 $^{\pm 0.18}$	75 $^{\pm 0.18}$	75 $^{\pm 0.18}$	75 $^{\pm 0.18}$
d	60$^{\pm 18}$	60$^{\pm 18}$	60$^{\pm 18}$	60$^{\pm 18}$
e	75 $^{\pm 0.18}$	75 $^{\pm 0.18}$	75 $^{\pm 0.18}$	75 $^{\pm 0.18}$
f	100 $^{\pm 0.24}$	100 $^{\pm 0.24}$	100 $^{\pm 0.24}$	–
g	200 $^{\pm 31}$	170 $^{\pm 27}$	125$^{\pm 27}$	100 $^{\pm 0.27}$

Mounting

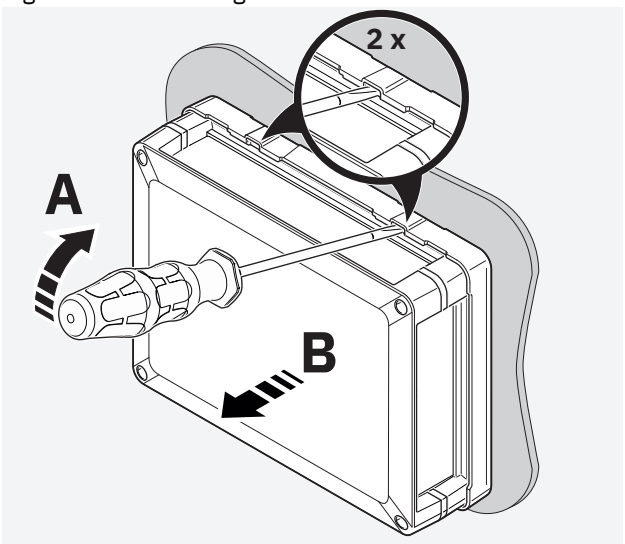
1104780	1104781	1225406	1225407
Wall outlet box, M3			
ø 60 mm	ø 60 mm	ø 60 mm	ø 60 mm
VESA display mount, M4			
75 x 75	75 x 75	75 x 75	75 x 75
100 x 100	100 x 100	100 x 100	–
200 x 100	–	–	–
Wall mount with 4 mm flat-head screw, S5 dowel			
200 x 170	170 x 120	125 x 100	100 x 60
Machine profile, M6			
200	170	125	100

Figure 21 Mounting the UCS WM-MP...



- Snap the housing onto the mounting panel.

Figure 22 Removing the UCS WM-MP...



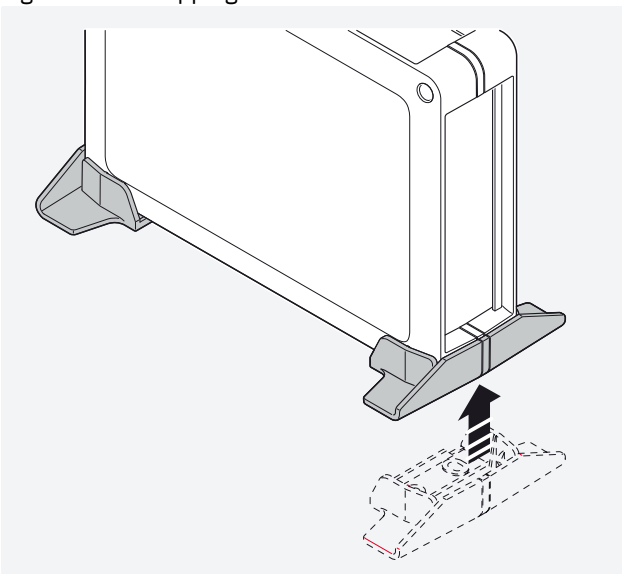
- Remove the housing using a bladed screwdriver.

A suitable VESA 75 x 100 display mount is available for mounting the mounting panel on wall brackets or machine profile brackets that can be swiveled. For an overview and ordering data, please refer to “VESA display mount” on page 54.

7.3 Mounting the stand

Snapping on the stand

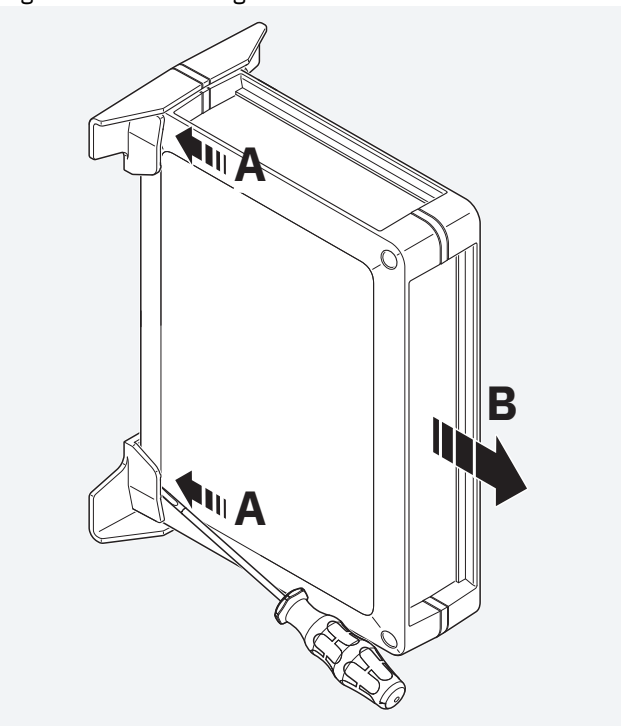
Figure 23 Snapping on the UCS PED... stand



- Snap the stand into the screw holes in the housing.

Removing the stand

Figure 24 Detaching the UCS PED... stand



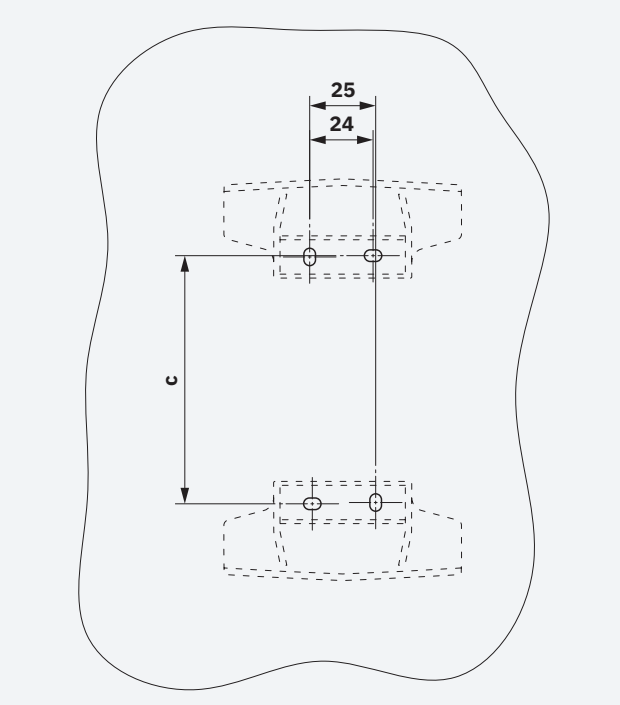
7.4 Mounting the housing on a wall using the stand

The UCS PED... stand has drill holes that are also suitable for wall mounting.

Recommended screws for wall mounting:
S5 dowel, ø screw 4.0 mm

Drilling template for wall mounting the stand

Figure 25 Drilling template for wall mounting

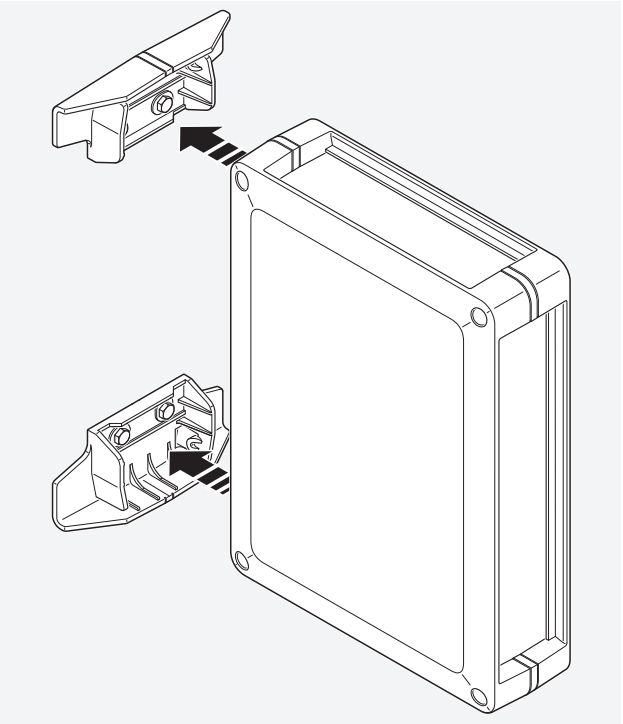


Dimensions for drilling template

Drill hole spacing c	Short side	Long side
UCS 87-87-F...	36 mm	36 mm
UCS 125-87-F...	36 mm	74 mm
UCS 145-125-F...	74 mm	94 mm
UCS 195-145-F...	94 mm	144 mm
UCS 237-195-F...	144 mm	186 mm

Snapping on the stand for wall mounting

Figure 26 Snapping on the UCS PED... stand for wall mounting



NOTE:
Observe the maximum permissible total weight (see “Technical data” on page 10).

7.5 Mounting the housing on DIN rails

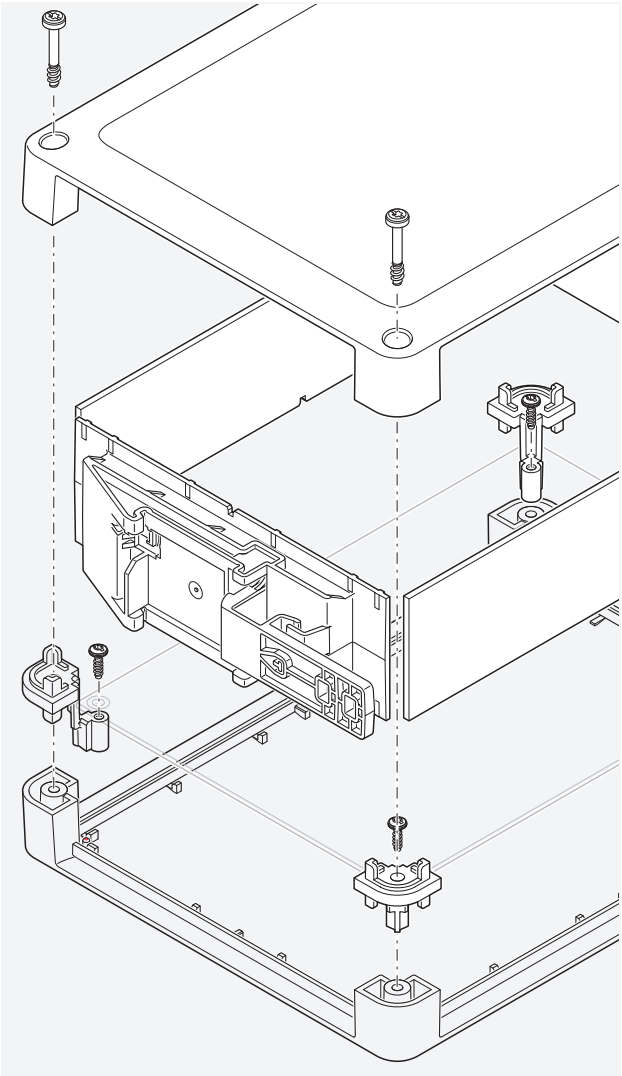
UCS housings can also be mounted on NS 35/7,5 and NS 35/15 DIN rails in accordance with DIN EN 60715. For this, replace an appropriate side panel with the UCS DIN... DIN rail adapter.

DIN rail adapters are available for the following housings:

– UCS 125-87... (for the longer side panel only)
– UCS 145-125...
– UCS 195-145... (for the shorter side panel only)

NOTE:
Observe the maximum permissible total weight (see “Technical data” on page 10).

Figure 27 Housing with DIN rail adapter (example)



Mounting

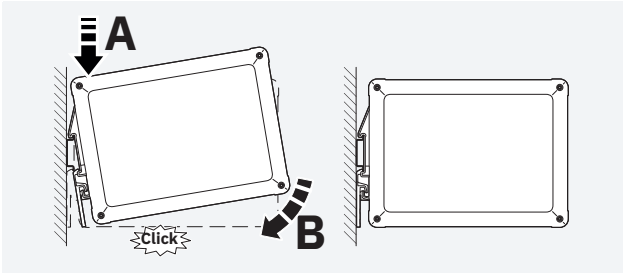
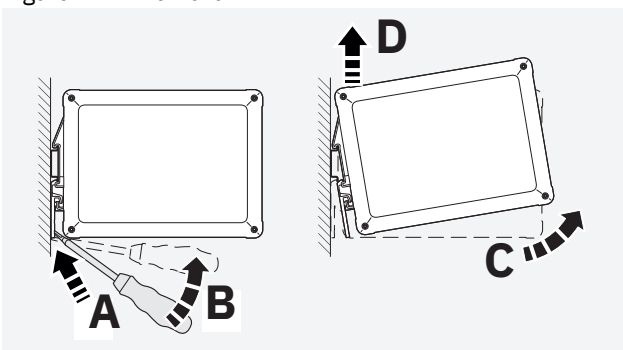


Figure 28 Mounting

- 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.
- Once the snap-on foot has audibly snapped onto the DIN rail, check that it is attached securely.

Removal

Figure 29 Removal



- Use a suitable screwdriver to release the locking mechanism on the snap-on foot of the device (B).
- Hold onto the device by the housing cover and carefully tilt it upwards.
- Carefully lift the device off the DIN rail.

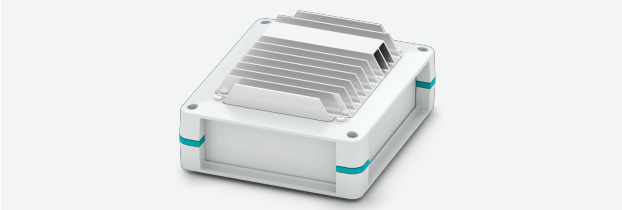
8 Half shell heatsink

Half shells with built-in heatsink and heat spreader are available for the UCS housing series. Alternatively, the heatsink can be obtained individually. The heatsink and the heat-emitting component are connected via a heat spreader, which distributes the selective heat over a larger surface.

The height of the heat spreader must be adjusted to the respective heat-emitting component. You can do this yourself or have Phoenix Contact do this.

The heat spreader is available in two sizes (for ordering data, see Page 9). You can combine the heat spreader with any heatsink size and connect several hotspots on the PCB to the heatsink.

Figure 30 Example for half shell heatsink



TIM

To improve thermal coupling between the heatsink, heat spreader, and hotspot, a thermal interface material (TIM) is applied.

The TIM depends on the components and the overall system. When selecting the TIM, consider the following:

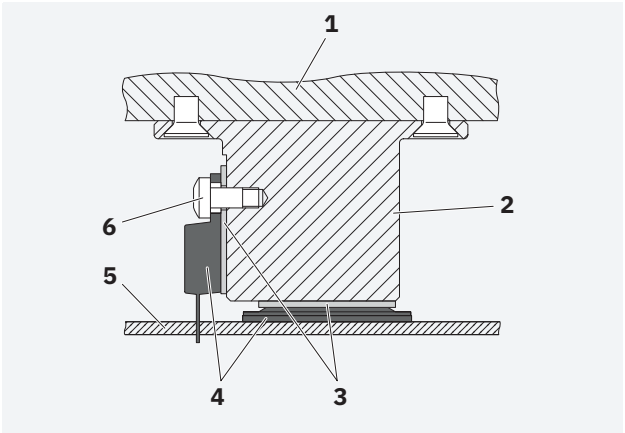
- Tolerance system
- Thermal conductivity or thermal resistance
- Required contact forces of the selected TIM
- Maximum permissible forces on the hotspot
- Surface properties of the hotspot
- Surface properties of the heat spreader
- Electrical properties of the TIM
- Permissible materials of the TIM
- Ambient conditions

Select the TIM according to the requirements of your application.

The selection of the TIM also depends on the variance expected in the air gap between the hotspot and the heat spreader. A low variance allows for a harder, less adaptable, and thinner TIM, which has better thermal properties.

Example for TIM

Figure 31 Example for TIM



1 Heatsink (UCS HS-HH...)
2 Heat spreader, individualized (UCS HSP...)
3 TIM
4 Hotspot
5 PCB
6 USC SHS M2,5X4 screw

Spacing bolts

The combination of heatsink and heat spreader is connected to the PCB assembly via spacing bolts. The combination requires a minimum contact force in order to establish the necessary thermal contact. The appropriate height of the spacing bolts is determined by the position of the PCB. The spacing bolts can be ordered separately. The height of the spacing bolts must be adjusted to the components.

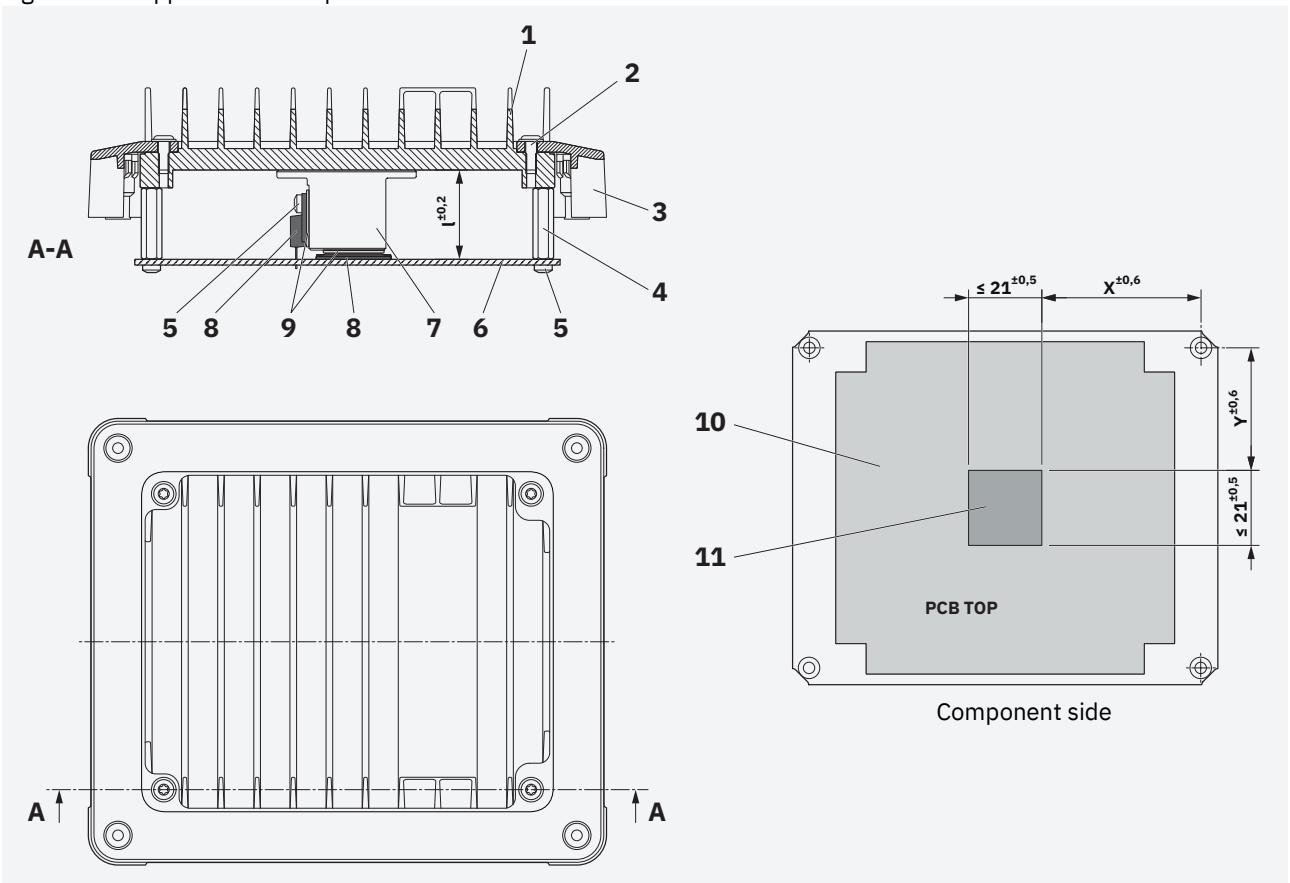
NOTE:
You must not generate the preload force between the heatsink and the heat spreader via the adhesive pads.

Safety note

WARNING: Risk of burns
The heatsink can become hot.

8.1 Application example for half shell heatsink

Figure 32 Application example for UCS HS-HH 145-125 AL

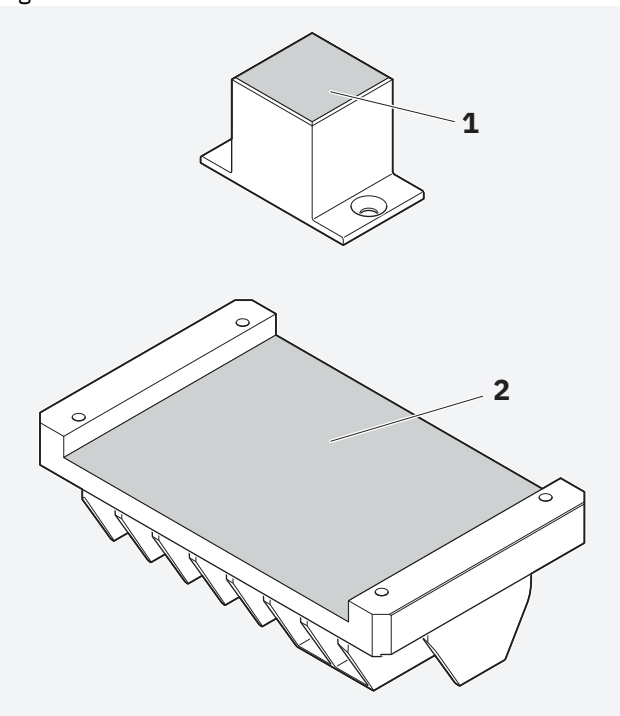


1 Heatsink (UCS HS-HH 145-125)
2 Raised countersunk screw
3 Half shell (UCS HH-HS 145-125)
4 Spacing bolt (UCS SB M2,5...)
5 Screw (UCS SHS M2,5X4)
6 PCB
7 Heat spreader
8 Hotspot
9 TIM
10 Heat transfer area
11 Heat spreader (UCS HSP...), maximum area of the heat transfer surface

8.2 Thermal contact area

Half shell heatsink and heat spreader

Figure 33 Thermal contact area



1 Thermal contact area of heat spreader
The sides of the heat spreader can be machined (after milling, they are optional thermal contact areas)

2 Thermal contact area of heatsink, can be machined

8.3 Areas

Areas for identification and machining

Figure 34 UCS HS-HH 125-87 AL heatsink

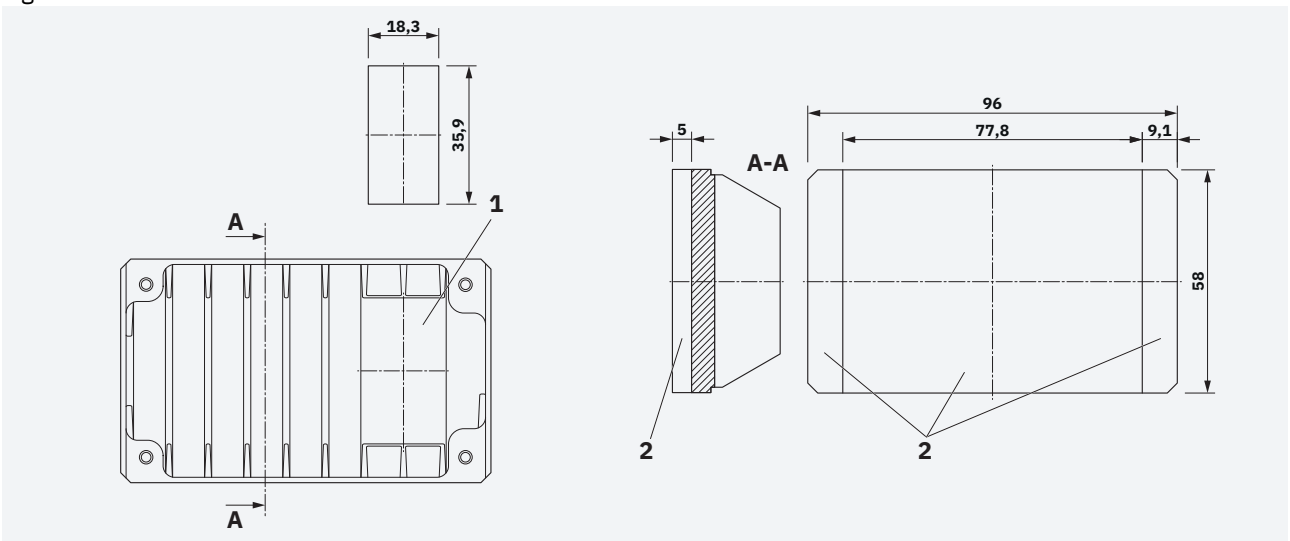
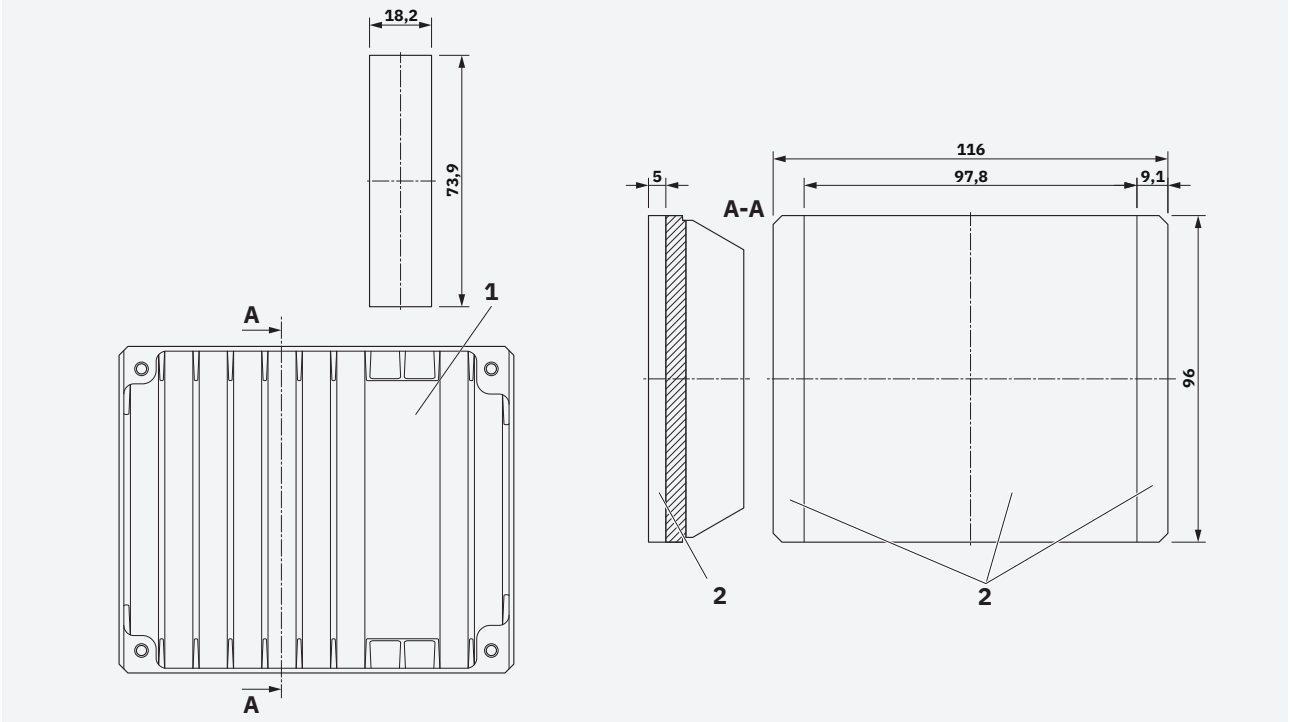


Figure 35 UCS HS-HH 145-87 AL heatsink

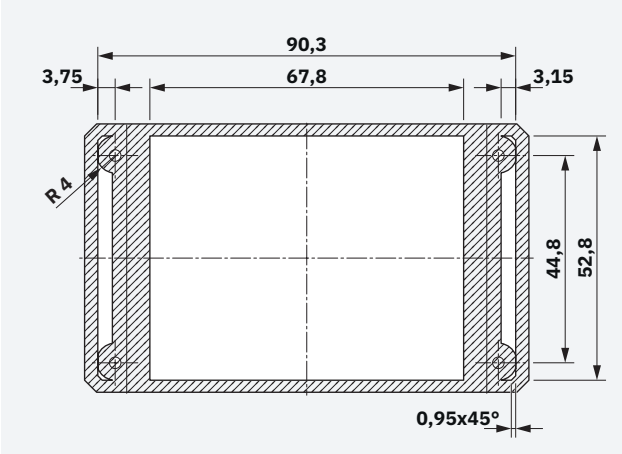


1 Areas for identification
Tolerance for printing: DIN ISO 2768-1 m
Machining radius at least R3, others on request

2 Areas for machining
Tolerance for machining: DIN ISO 2768-1 fH

UCS HS-HH 125-87 AL heatsink

Figure 36 Area for spacing bolts



The center of the spacing bolt may be placed on the non-hatched surfaces.

Figure 37 Area for heat transfer surface

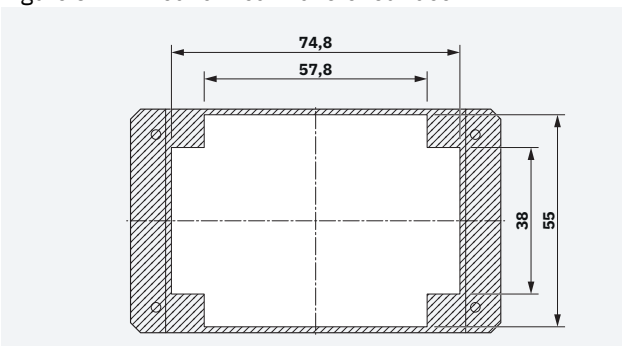
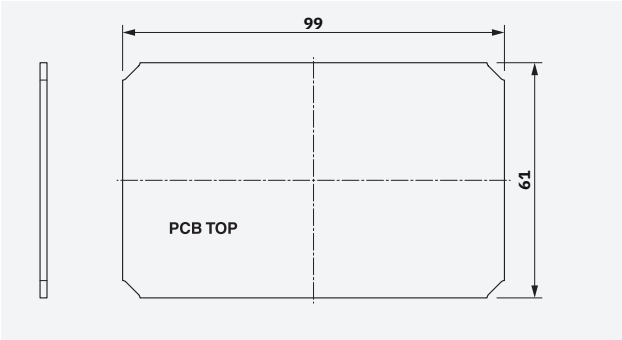
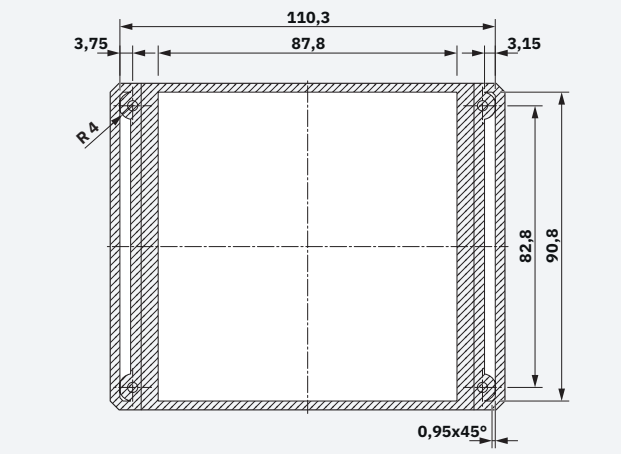


Figure 38 Recommended maximum PCB



UCS HS-HH 145-125 AL heatsink

Figure 39 Area for spacing bolts



The center of the spacing bolt may be placed on the non-hatched surfaces.

Figure 40 Area for heat transfer surface

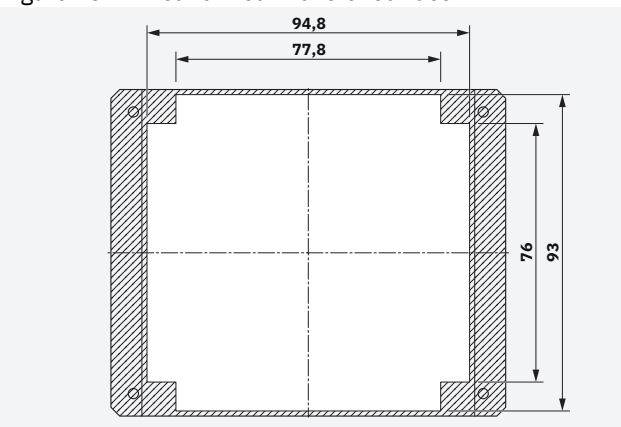
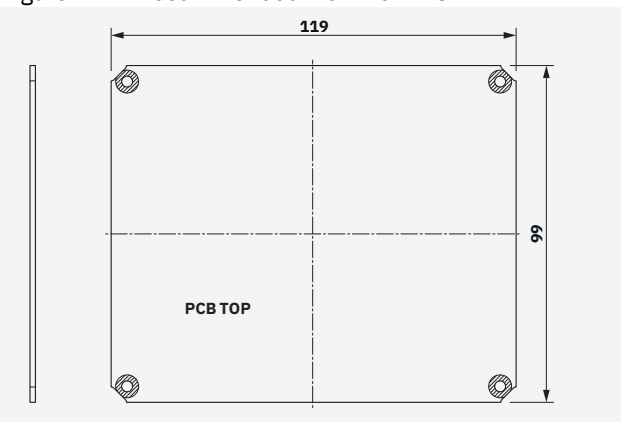
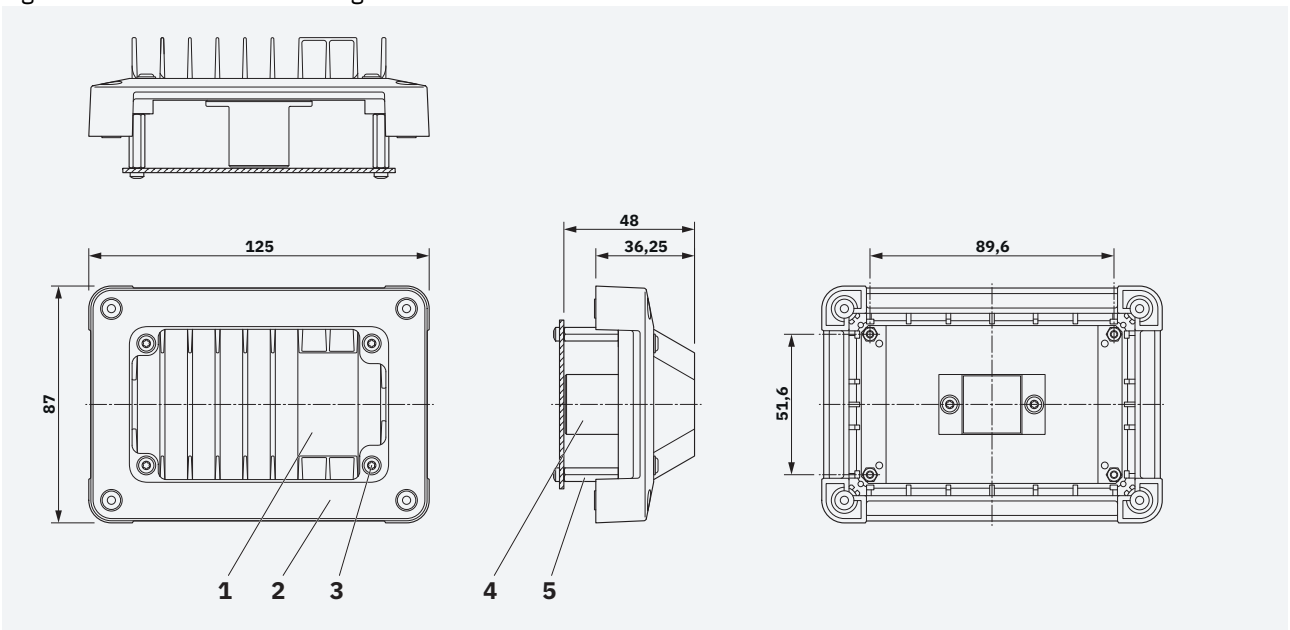


Figure 41 Recommended maximum PCB



8.4 Dimensional drawings of half shell with heatsink and heat spreader

Figure 42 Dimensional drawing of UCS HH-HSAS1 125-87

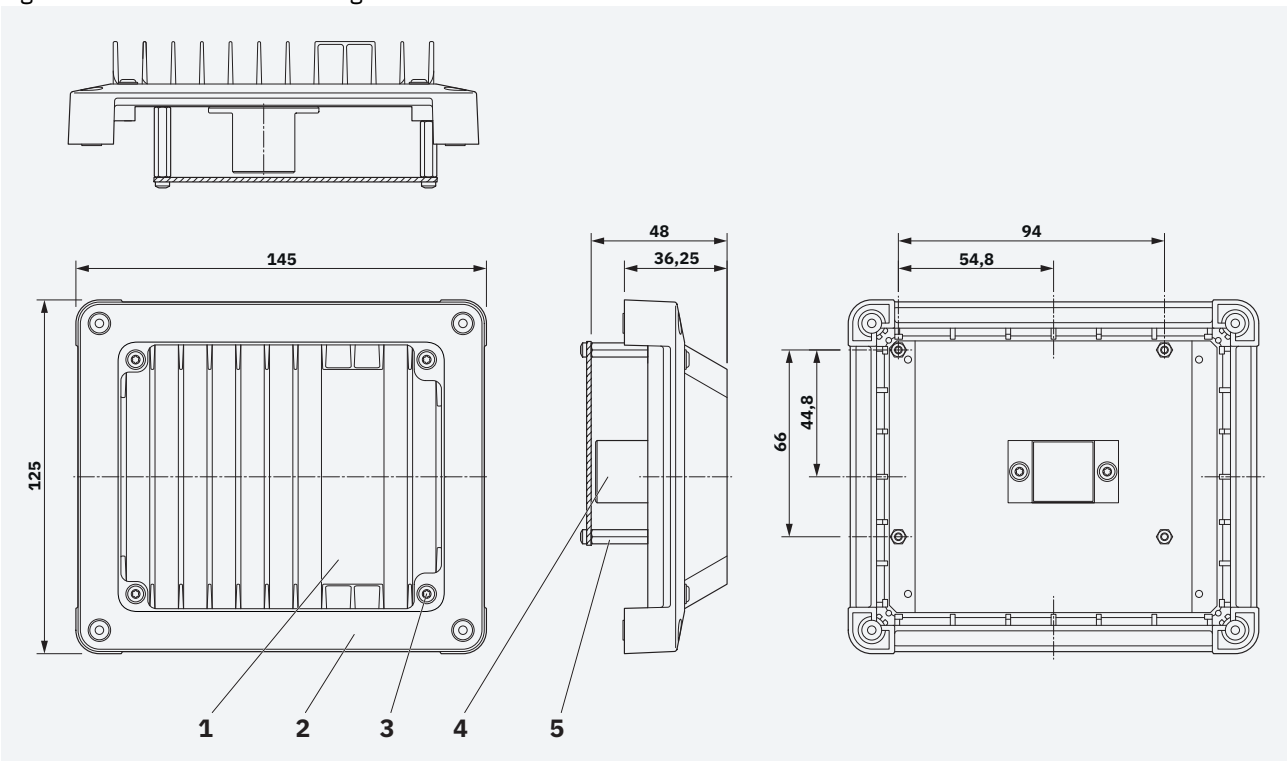


1 Heatsink
2 Half shell
3 Screw
4 Spacing bolts
5 Heat spreader

Screws for attaching the PCB: UCS SHS M2,5X4, 1495002

PCB thickness: 1.4 mm ... 1.8 mm

Figure 43 Dimensional drawing of UCS HH-HSAS2 145-125



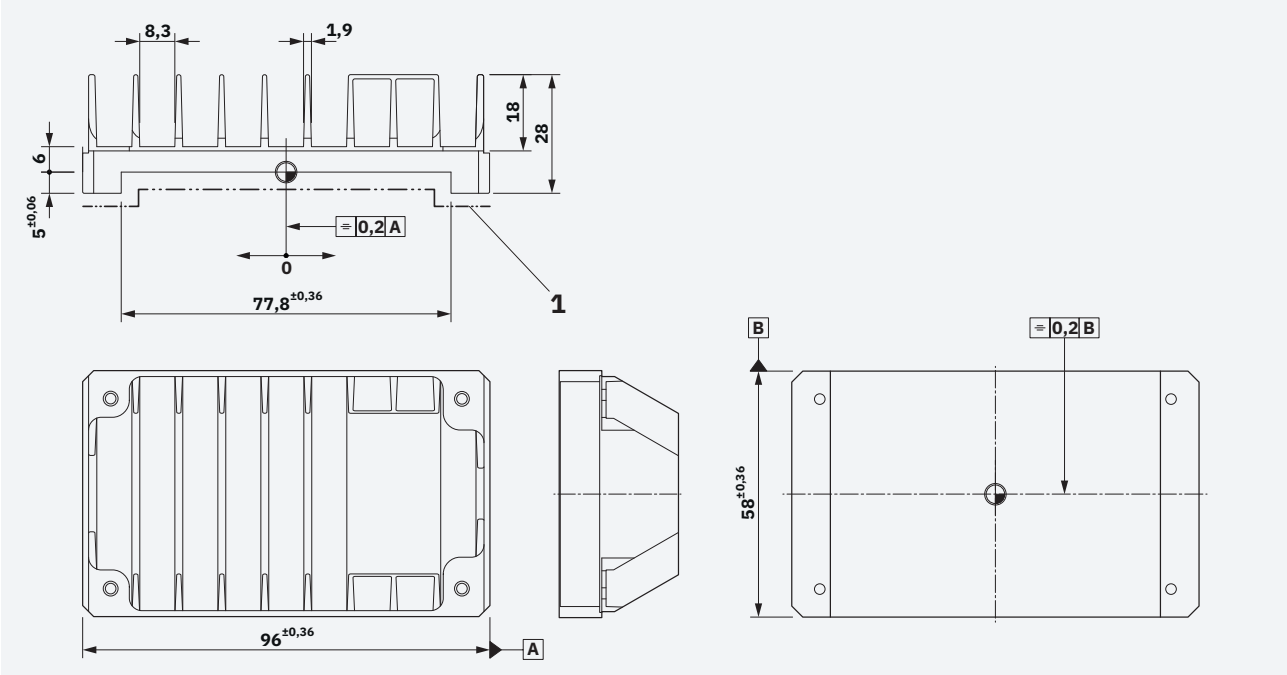
1 Heatsink
2 Half shell
3 Screw
4 Spacing bolts
5 Heat spreader

Screws for attaching the PCB: UCS SHS M2,5X4, 1495002

PCB thickness: 1.4 mm ... 1.8 mm

8.5 Dimensional drawings of heatsink

Figure 44 Dimensional drawing of UCS-HH 125-87 AL



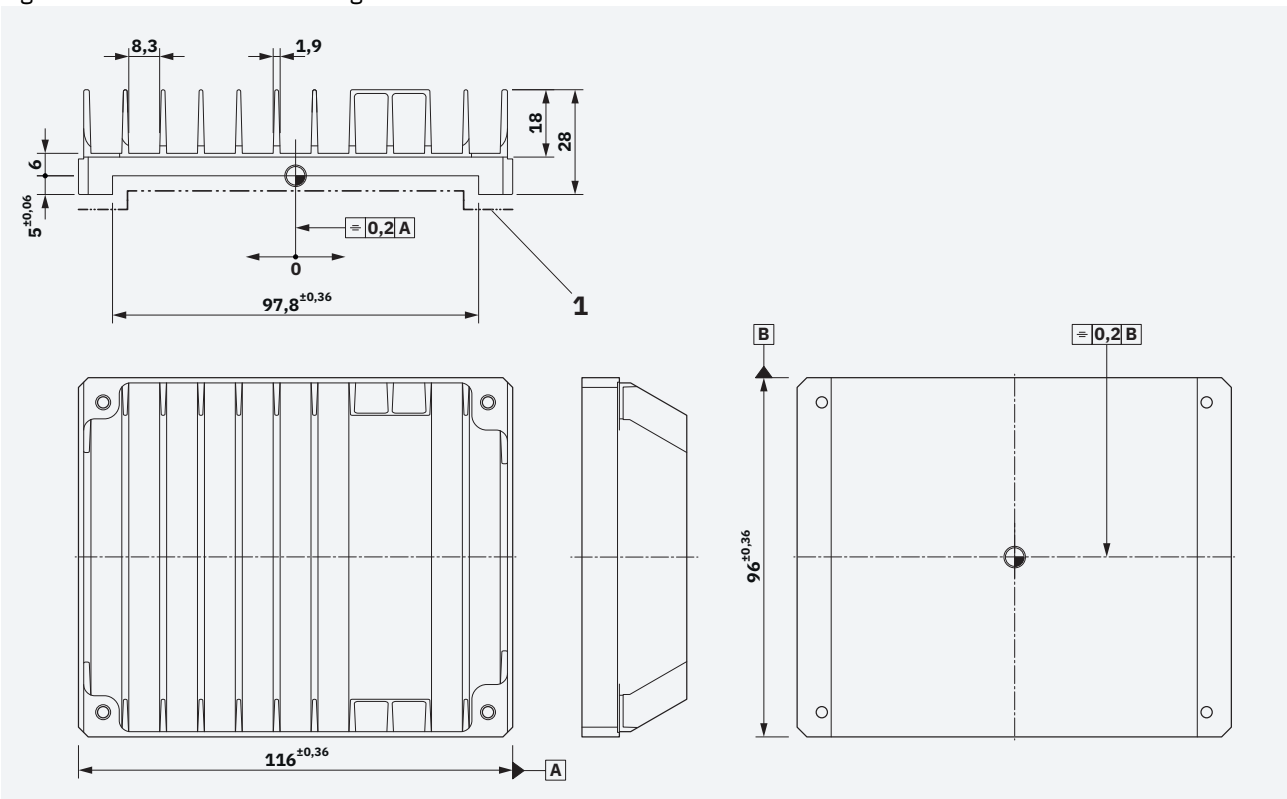
1 **Dashed line,** area for machining, after milling, optional thermal contact area, depth of roughness Rz 6.3 µm

Zero point of the workpiece for milling

Machining radius at least R3, others on request

Tolerance for machining: DIN ISO 2768-1 fH

Figure 45 Dimensional drawing of UCS-HH 145-125 AL



1 **Dashed line,** area for machining, after milling, optional thermal contact area, depth of roughness Rz 5.0

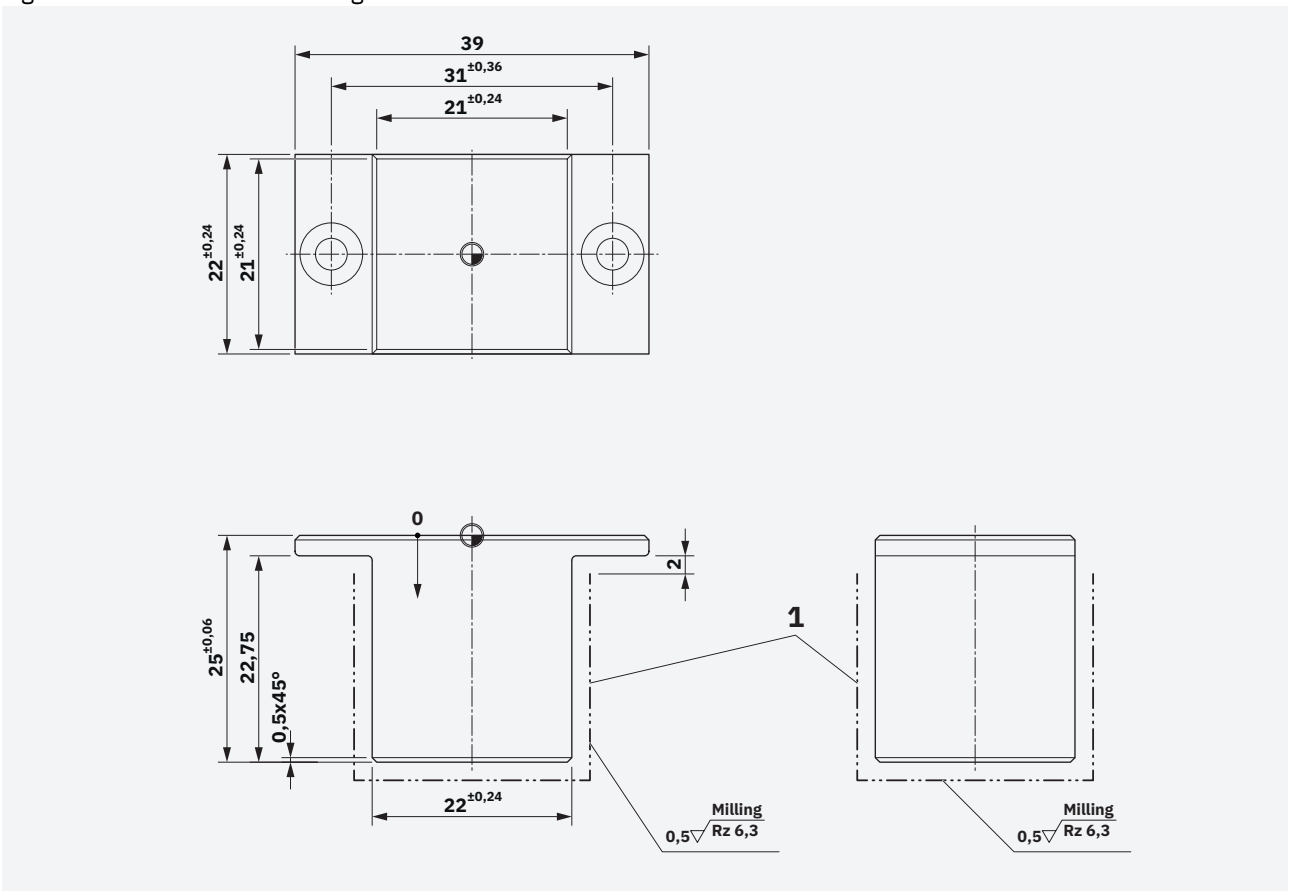
Zero point of the workpiece for milling

Machining radius at least R3, others on request

Tolerance for machining: DIN ISO 2768-1 fH

8.6 Dimensional drawings of heat spreader

Figure 46 Dimensional drawing of UCS HSP 22-25 AL



1 **Dashed line,** area for machining, after milling, optional thermal contact area, depth of roughness Rz 6.3 µm

Zero point of the workpiece for milling

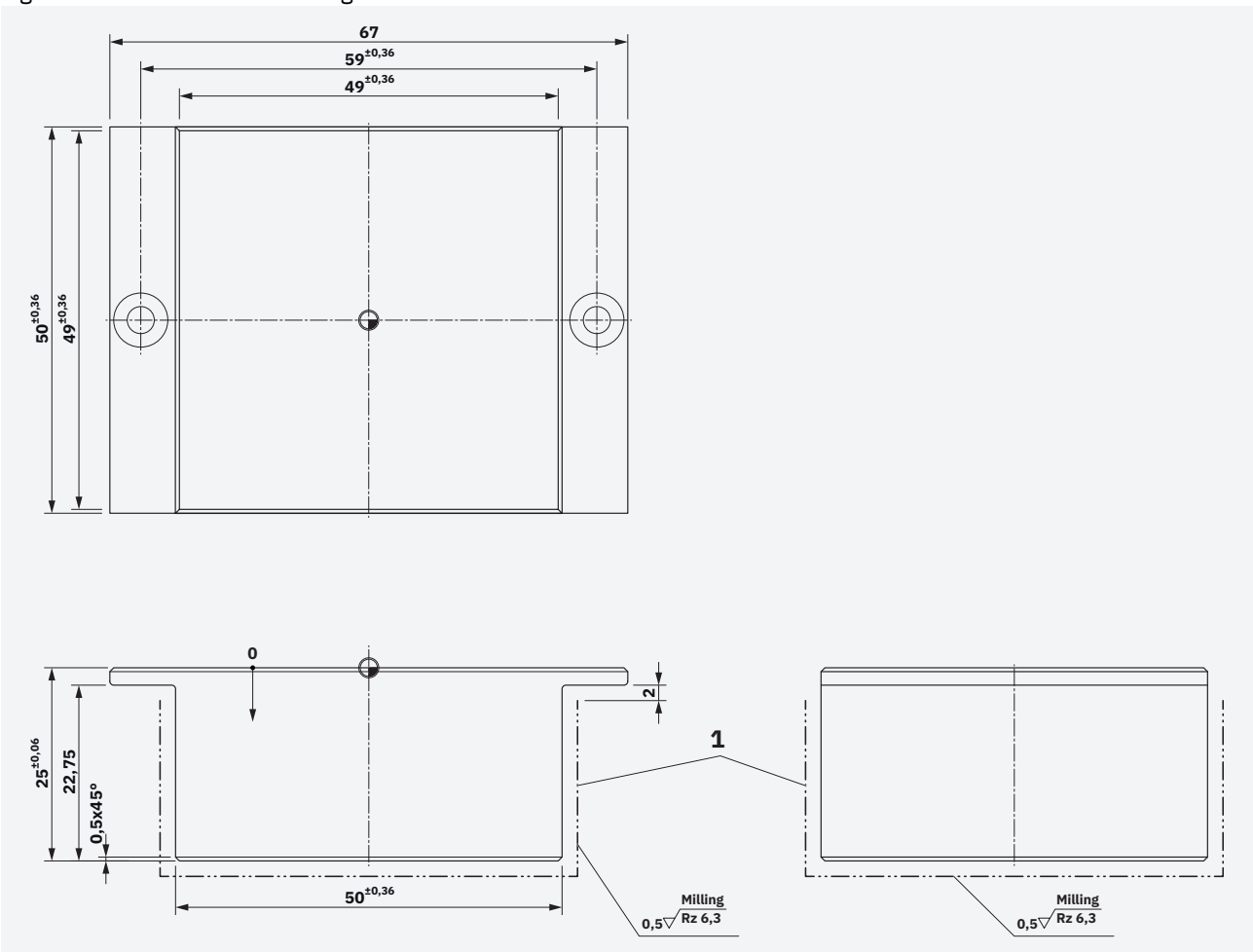
Machining radius at least R3, others on request

Tolerance for the machining from milling contour to milling contour: DIN ISO 2768-1 fH

Milling allowance 0.5 mm

Evenness <0.1 mm at the heat transfer point

Figure 47 Dimensional drawing of UCS HSP 50-25 AL



1 **Dashed line,** area for machining, after milling, optional thermal contact area, depth of roughness Rz 6.3 µm

Zero point of the workpiece for milling

Machining radius at least R3, others on request

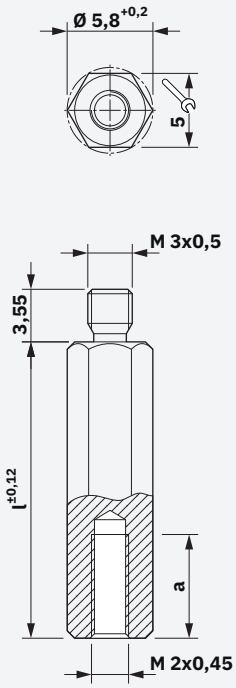
Tolerance for the machining from milling contour to milling contour: DIN ISO 2768-1 fH

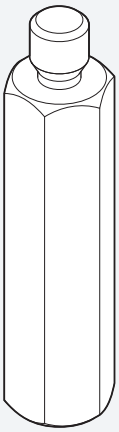
Milling allowance 0.5 mm

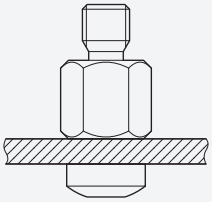
Evenness <0.1 mm at the heat transfer point

8.7 Spacing bolts

Figure 48 Dimensional drawing of UCS SB M2,5...







Application example

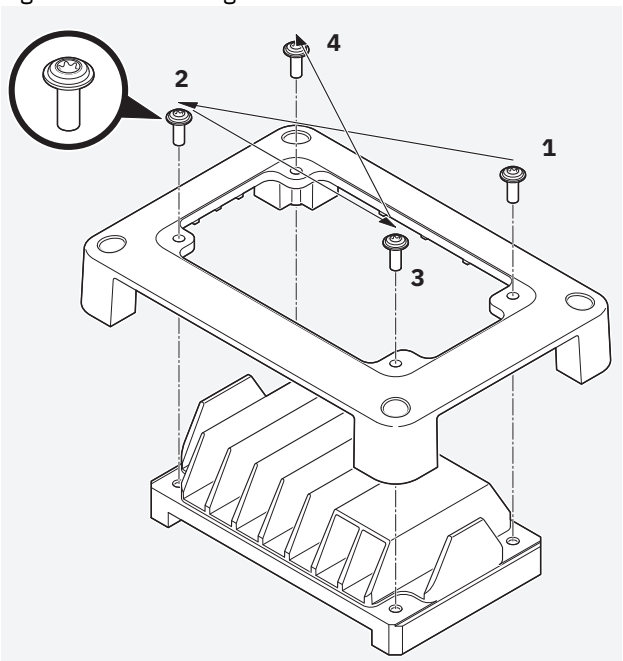
UCS SB M2,5X5 spacing bolt, 1494983 with UCS SHS M2,5X4 screw, 1495002

Spacing bolts		Length l	Thread depth a
UCS SB M2,5X5	1494983	5	3
UCS SB M2,5X10	1494984	10	7
UCS SB M2,5X15	1494989	15	7
UCS SB M2,5X20	1494990	20	7
UCS SB M2,5X25	1494992	25	7

8.8 Mounting half shell heatsinks

Screwing the heatsink to the half shell

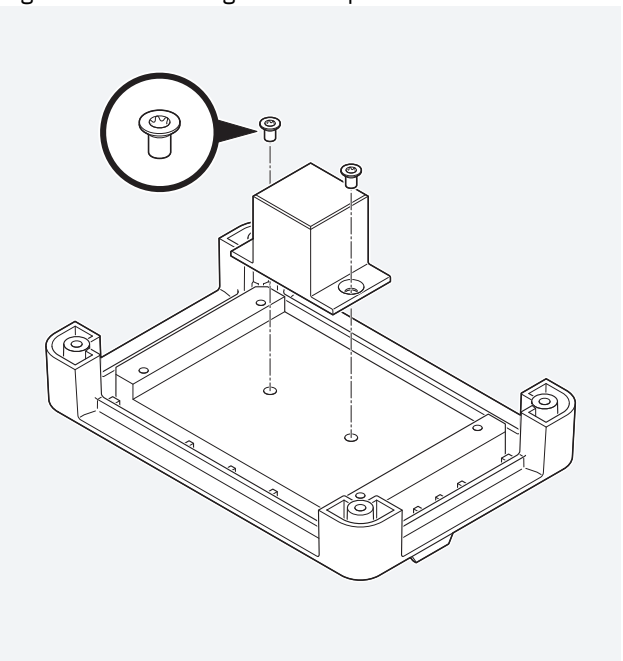
Figure 49 Screwing the heatsink to the half shell



- Use the four screws provided to screw the upper half shell to the heatsink in the order shown. (M3x8, Torx T10, tightening torque 0.8 Nm ... 0.1 Nm)

Screwing the heat spreader to the heatsink

Figure 50 Screwing the heat spreader to the heatsink



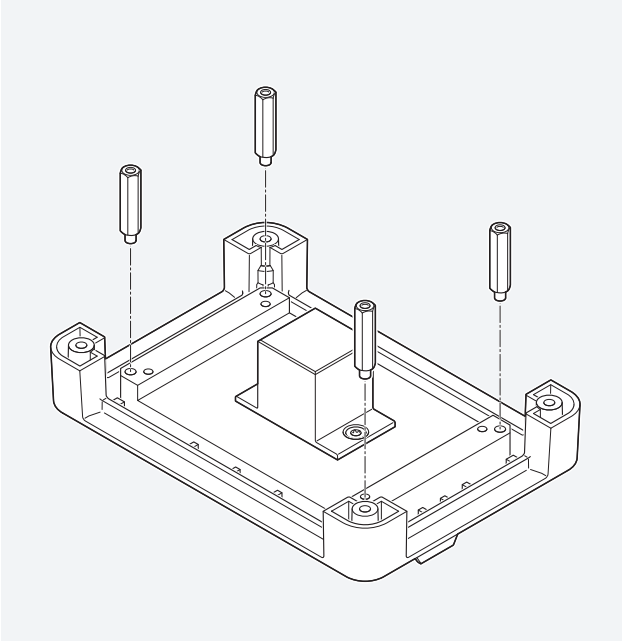
- Screw the heat spreader onto the heatsink using the two M3 countersunk screws provided.

  The screws have an adhesive locking coating. (Tightening torque: 0.25 Nm ... 0.35 Nm)

  The position of the bore holes required in the heatsink depends on the individual case. You can drill the bore holes yourself or have Phoenix Contact do this.

Mounting the spacing bolts

Figure 51 Mounting the spacing bolts



- Screw the four spacing bolts to the heatsink (inner thread M2.5, wrench size 5).

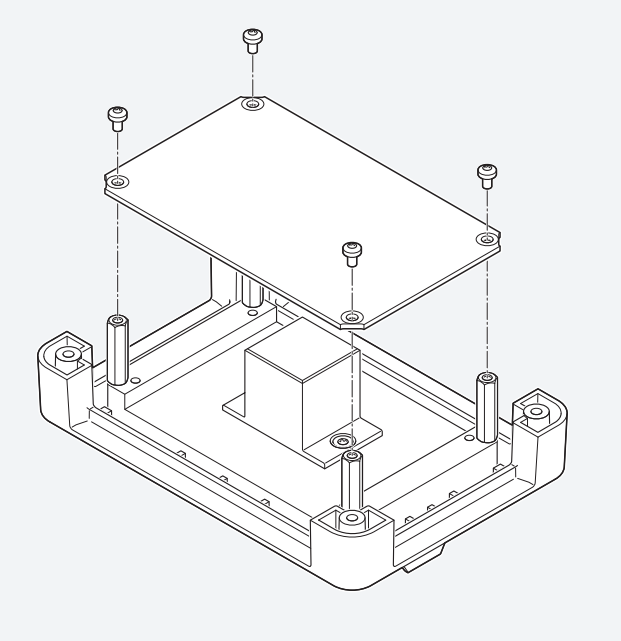
  The length of the spacing bolts is determined by the structure of the assembled PCB.

NOTE: Notes on the spacing bolt

- Screw the spacing bolts to a maximum of 2x.
- Do not use plastic spacing bolts.
- Observe the maximum screw-in depth of 3 mm.

Screwing on the PCB

Figure 52 Screwing on the PCB



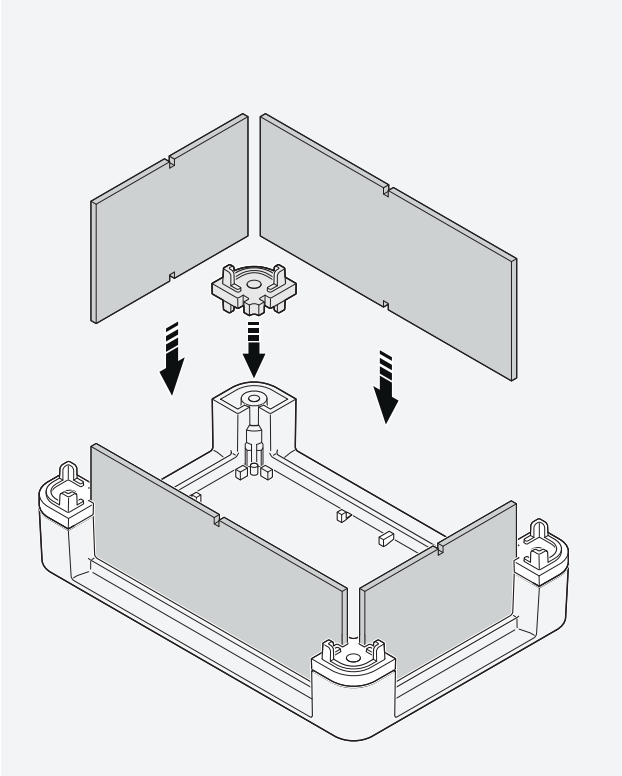
NOTE: For safe device operation, the PCB must be securely screwed into the heatsink.

- Use appropriate thermal interface material (TIM) to make contact with the hotspots. Apply the TIM to the hotspot or the heat spreader.
- Screw the PCB to the spacing bolts using the UCS SHS M2,5X4 screws, 1495002. Press the heatsink and PCB together using the spacing bolts. The press-down force depends on the overall system and the PCB.

NOTE: You must not generate the press-on force via the UCS GD 9005 adhesive pads.

Inserting corner inlays and side panels

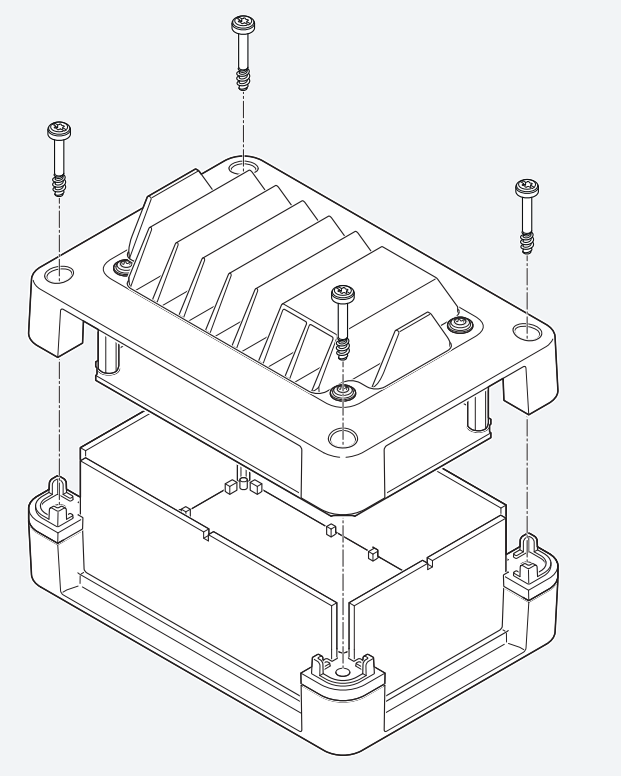
Figure 53 Corner inlays and side panels



- Insert the four corner inlays into the bottom half shell.
- Insert the four side panels and the PCB.

Screwing on the housing

Figure 54 Screwing on the housing



- Place the bottom half shell on. Push the side panels into the lower housing half shell.
- Screw the two housing halves to 1.2 Nm ... 1.4 Nm. Use the self-tapping Torx T10 screws supplied. We recommend a torque screwdriver with a T10 bit (500 rpm ... 1000 rpm).

NOTE: The housing can be opened a maximum of 10 times.

NOTE: To reach IP30, all unused holes in the heat-sink must be closed.

Functional ground

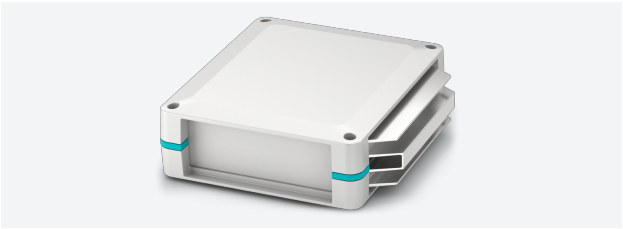
You can make individual connection holes for functional ground. You can use a separate cable with ring cable lug and toothed lock washer for contacting.

9 Side panel heatsink

Side panels with built-in heatsink are available for the UCS housing series. The side panel heatsink has a bar on which the PCB is screwed.

Side panel heatsink	
UCS HS-SW 125-F AL	1481699
UCS HS-SW 145-F AL	1481701

Figure 55 Housing with side panel heatsink



TIM

To improve thermal coupling between the heatsink, heat spreader, and hotspot, a thermal interface material (TIM) is applied.

The TIM depends on the components and the overall system. When selecting the TIM, consider the following:

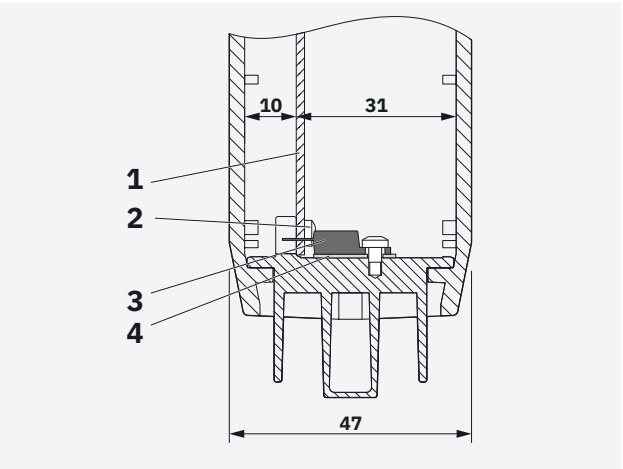
- Tolerance system
- Thermal conductivity or thermal resistance
- Required contact forces of the selected TIM
- Maximum permissible forces on the hotspot
- Surface properties of the hotspot
- Surface properties of the heat spreader
- Electrical properties of the TIM
- Permissible materials of the TIM
- Ambient conditions

Select the TIM according to the requirements of your application.

The selection of the TIM also depends on the variance expected in the air gap between the hotspot and the heat spreader. A low variance allows for a harder, less adaptable, and thinner TIM, which has better thermal properties.

Example for TIM

Figure 56 Example for TIM - UCS HS-SW...



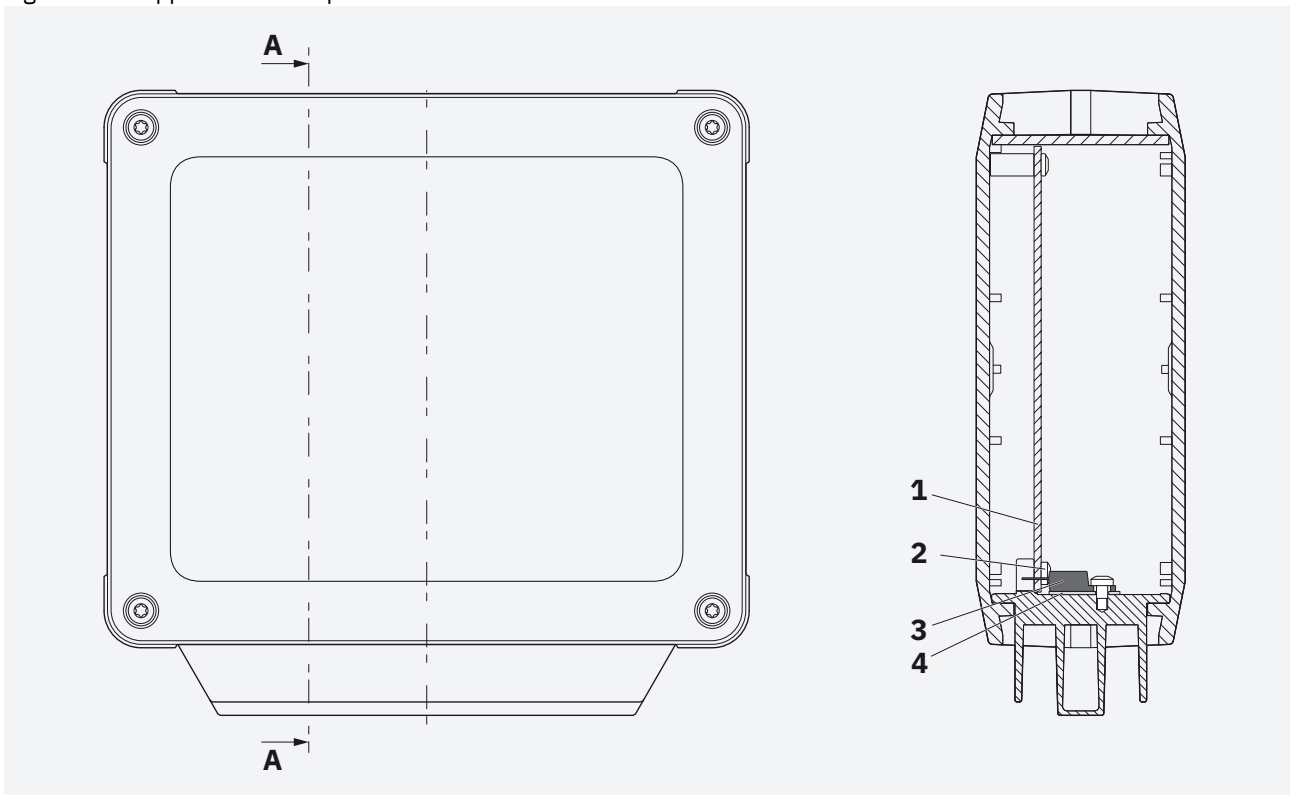
1 PCB (PCB thickness 1.4 mm ... 1.8 mm)
2 UCS SHS M2,5X4 screw, 1495002
3 Hotspot
4 TIM

Safety note

WARNING: Risk of burns
The heatsink can become hot.

9.1 Application example for side panel heatsink

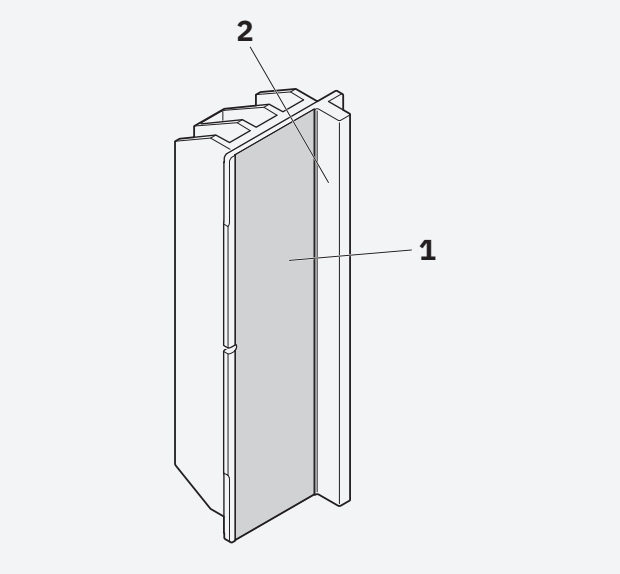
Figure 57 Application example for UCS HS-SW...



1 PCB (PCB thickness 1.4 mm ... 1.8 mm)
2 UCS SHS M2,5X4 screw, 1495002
3 Hotspot
4 TIM

9.2 Thermal contact area and PCB mounting

Figure 58 Thermal contact area of side panel heatsinks



1 Thermal contact area

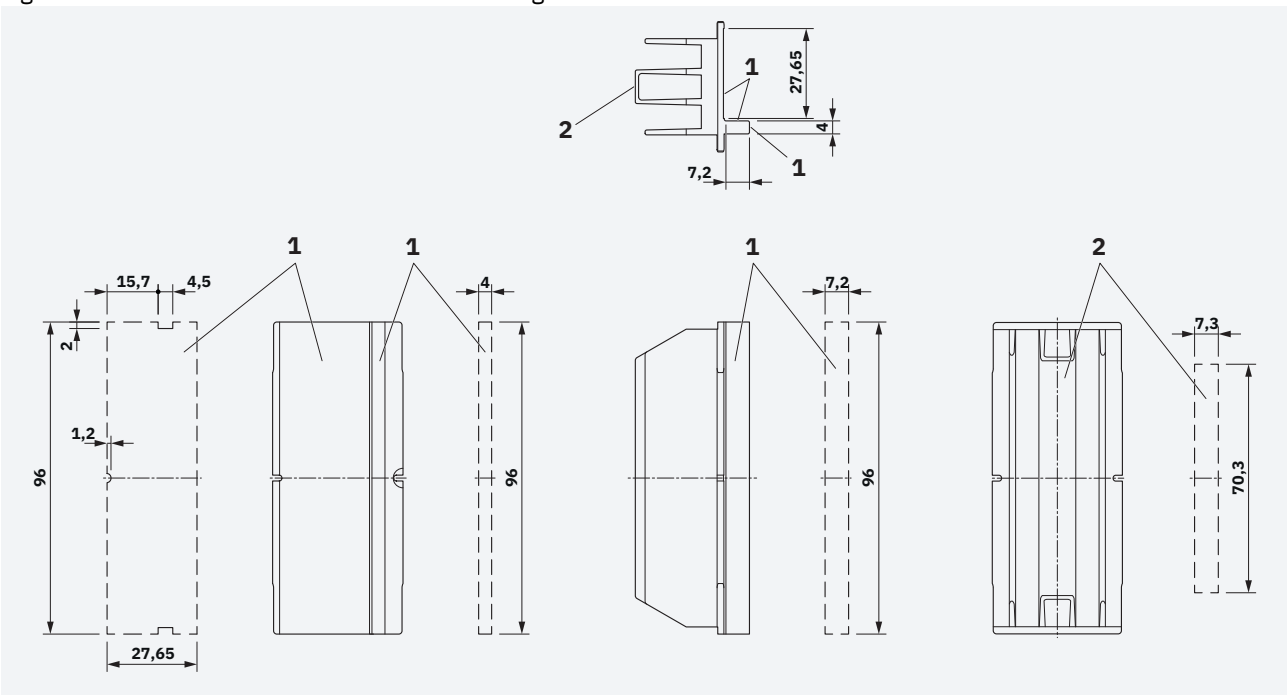
2 Bar for PCB mounting with UCS SHS M2,5X4 screws, 1495002

NOTE: If necessary, the bar must be adapted in order to maintain the air clearances and creepage distances.

9.3 Areas for identification and machining

Areas for side panel heatsinks

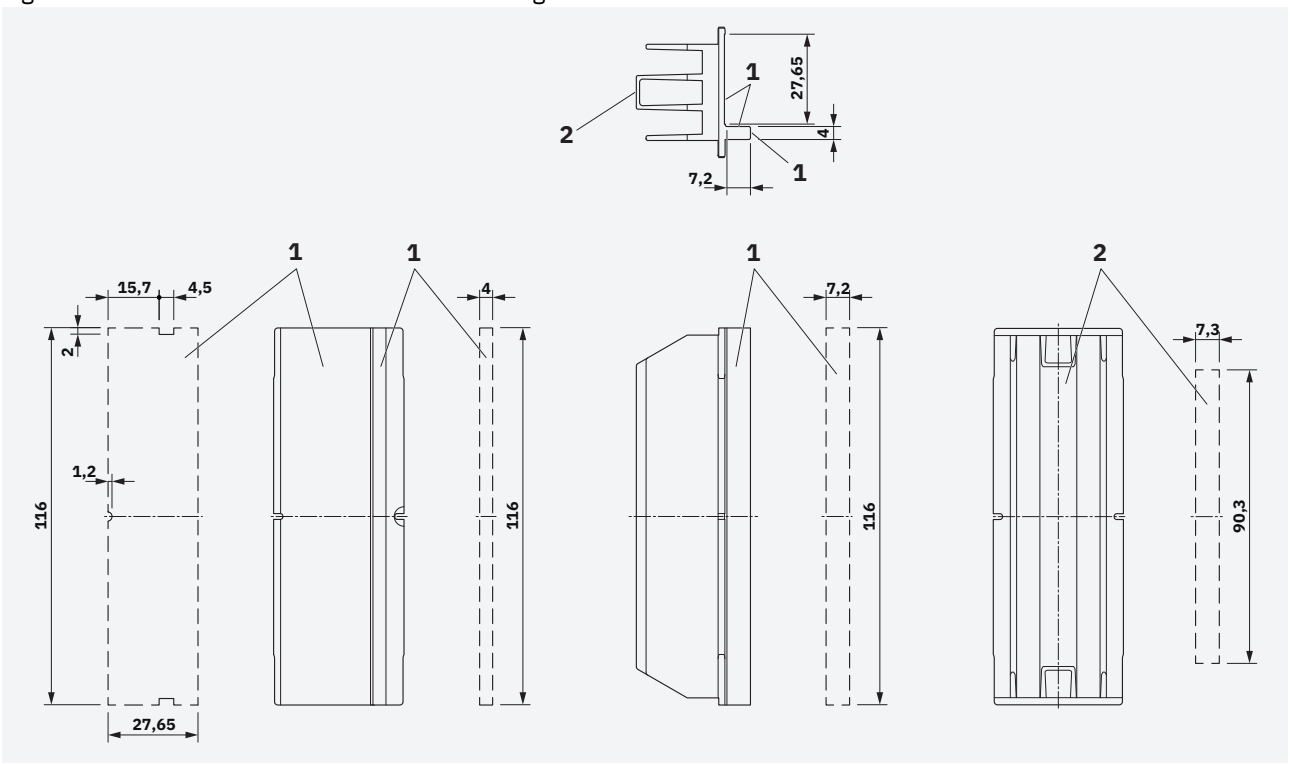
Figure 59 Areas for identification and machining the UCS HS-SW 125-F AL



1 Area for machining

2 Area for identification

Figure 60 Areas for identification and machining the UCS HS-SW 145-F AL



1 Area for machining

2 Area for identification

9.4 Dimensional drawings

Figure 61 Dimensional drawing of UCS HS-SW 125-F AL

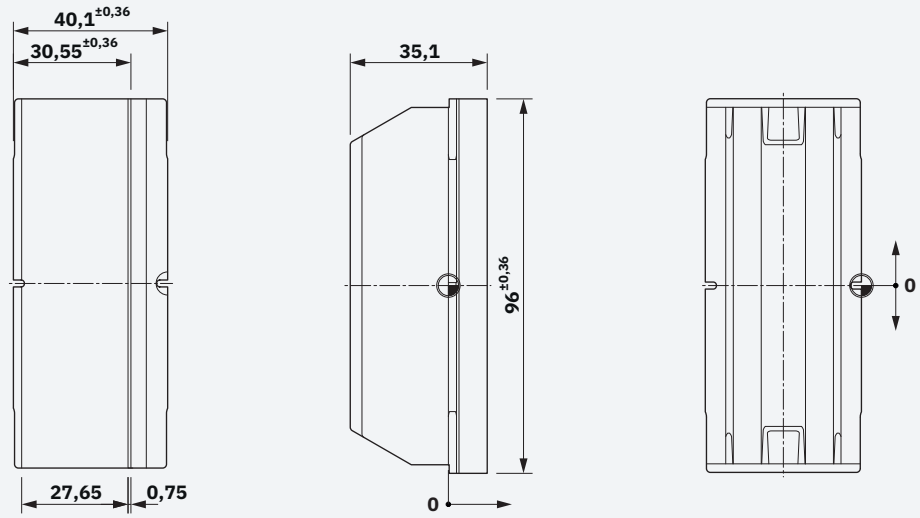


Figure 62 Dimensional drawing of UCS HS-SW 145-F AL

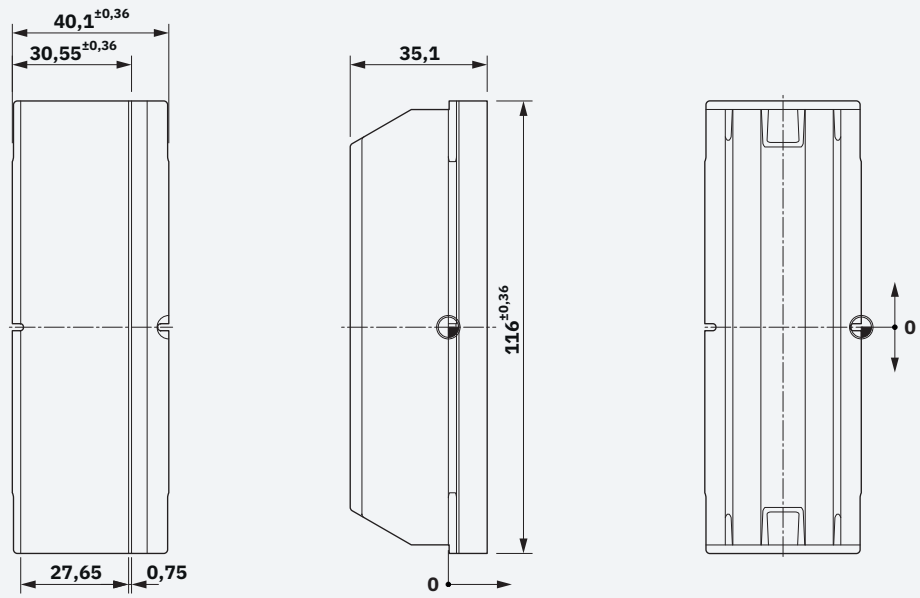
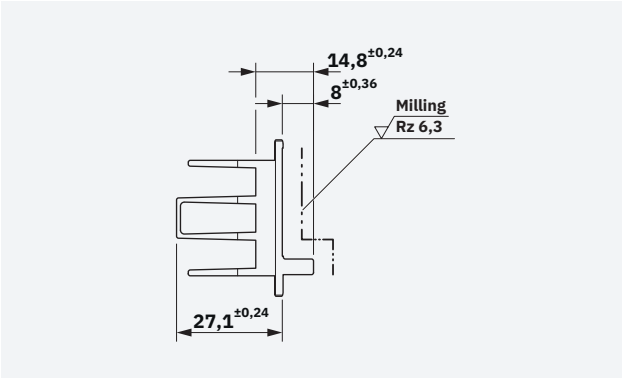
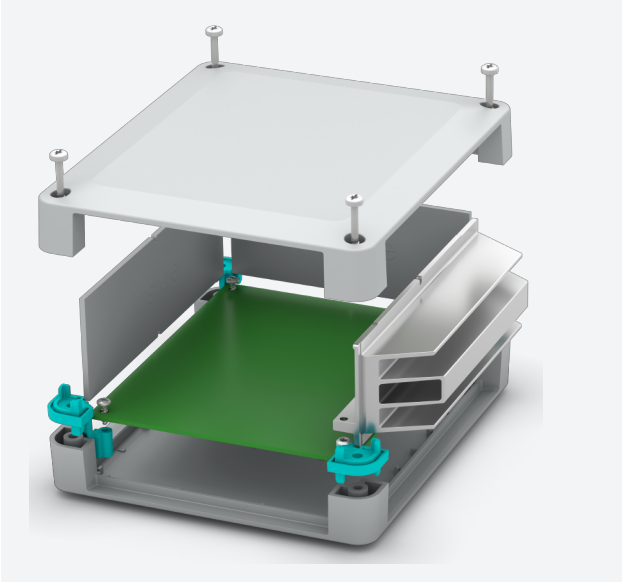


Figure 63 Dimensional drawing of UCS HS-SW...



9.5 Mounting the side panel heatsink

Figure 64 Mounting



Connecting the PCB to the heatsink

- Mount the side of the PCB with the components to be cooled on the side panel heatsinks.

  Screw the PCB on the bar of the side panel heatsink using UCS SHS M2,5X4 screws, 1495002 (tightening torque 0.5 Nm ... 0.6 Nm)

  Use appropriate thermal interface material (TIM) to make contact with the hotspots.

Closing the housing

- Insert the corner inlays (UCS CC...) into the corners of the lower half shell.
- Insert the side panel heatsink vigorously into the half shell.
- Screw the PCB to the corner inlays. Only use the Tory T7 screws supplied. We recommend a torque screwdriver with a T7 bit (0.4 Nm ... 0.5 Nm; 500 rpm ... 1000 rpm).
- Screw on the upper housing half shell with 1.2 Nm ... 1.4 Nm. Use the self-tapping T10 Torx screws provided to attach the housing. We recommend a torque screwdriver with a T10 bit (500 rpm ... 1000 rpm).

NOTE:
The housing can be opened a maximum of 10 times.

Functional ground

You can make individual connection holes for functional ground. You can use a separate cable with ring cable lug and toothed lock washer for contacting.

Safety note

WARNING: Risk of burns
The heatsink can become hot.

10 Accessories and customization

10.1 Functional ground contact

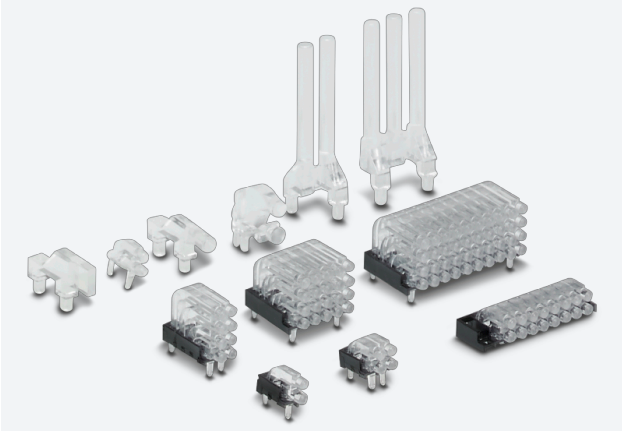
Figure 65 ME BUS FE CONTACT, 2278076

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

For this, you need the ME BUS FE CONTACT functional ground contact (2278076) and the UCS DIN... DIN rail adapter.

10.2 HS-LC light guides

Figure 66 HS-LC... type light guides



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

The complete list of accessories can be found at phoenixcontact.com, web code: #0853.

10.3 Tools

Combined Torx/slotted screws are used to screw on the housing half shells. Phoenix Contact offers various tools:

- SF-ASD 21 cordless torque screwdriver, 1212532
- TSD-M 1,2NM torque screwdriver, 1212224
- SF-BIT-TX 10-50 screw insert, 1212573

10.4 TFT touch displays

To visualize or operate your application, you can integrate touch displays into UCS housings.

- The UCS 237-195-F-GD-RPI-DT7* housings (1104780 and 1104781) have been prepared for installing a Raspberry Pi 7" touch display and a Raspberry Pi 2B or 3B.
- 2.4″ touch display for installation in UCS housings (DCT T 2,4 QVGA S RTOUCH,1132710).

  Suitable UCS housings:
  - UCS 125-87-F-... (recommended size)
  - UCS 145-125...
  - UCS 195-145...
  - UCS 237-195...
- A complete housing with integrated 2.4" touch display is also available.
  - UCS 125-87-F-GD-D2,4-TRG 7035, 1246286
  - UCS 125-87-F-GD-D2,4-TRG 9005, 1246287

Figure 67 2.4" touch display

10.5 Connection technology

As the USC series is a modular system, you can select different connection technologies.

Board-to-board connectors

- **IDC female connector strips** of the FR 1,27 series, 1.27 mm pitch (FR 1,27...-FWL, web code #3242)
- **Shielded SMD male or female connector strips** of the FINEPITCH series
  Pitch: 0.8 mm (FP 0,8/..., web code #2050)
  Pitch: 1.27 mm (FP 1,27/..., web code #1520)
- **SMD male or female connector strips** of the FS series for high-speed data transmission
  Pitch: 0.635 mm (FS 0,635/..., web code #2879)
- **Unshielded SMD male or female connector strips** of the FINEPITCH series
  Pitch: 0.8 mm (FP 0,8/..., web code #2330)
- **SMD pin and base strips** of the FQ series
  Pitch: 1.27 mm (FQ 1,27D/..., web code #2658)
  Pitch: 2.45 mm (FQ 2,45D/..., web code #2659)

Data connectors

- **RJ45 PCB connectors** of the CUC series (CUC..., web code #2341 and #2887)
- **Single Pair Ethernet**, SPE PCB connectors and patch cables (SPE-T1-..., web code #2671)
- **USB PCB connectors** of the CUC series (CUC-USB..., web code #2888)

10.6 Membrane keypad

Membrane keypads for different applications are available.

Further information on membrane keypads can be found at phoenixcontact.com, web code: #1640.

10.7 VESA display mount

In conjunction with the UCS WM-MP... mounting panel, an additional bracket frame provides additional mounting options on a wall or a machine profile.

Figure 68 Mounting panel with VESA monitor holder

- **Connection plate**, VESA 75/100 for the UCS WM-MP... mounting panel (HS MP VESA75/100 DCS, 1082303)

  Suitable for UCS housings:
  - UCS 125-87-F-...
  - UCS 145-125...
  - UCS 195-145...
  - UCS 237-195...

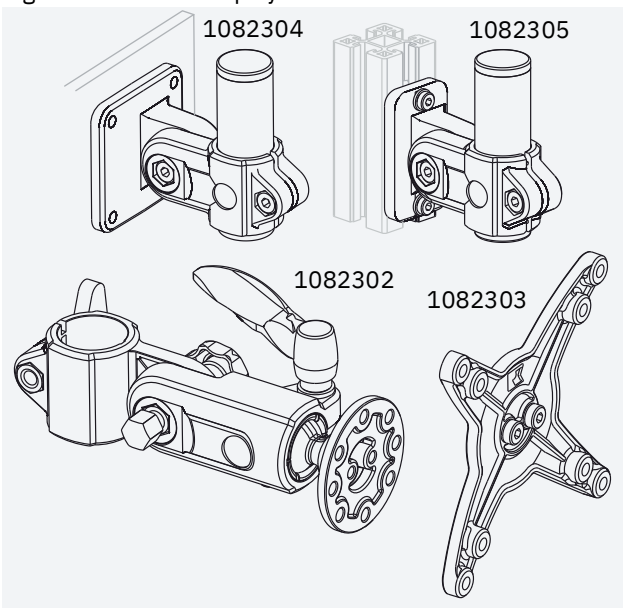
A bracket frame with ball joint is available for the VESA 75/100 connection plate.

- **Bracket frame with ball joint** (HS EH-B 140,5 DC, 1082302)

The bracket frame with ball joint can be attached to a wall bracket frame or a machine profile bracket frame.

- **Wall bracket frame**, 75 mm (HS WM-S 75 DCS, 1082304)
- **Bracket frame for machine profile**, 40 mm, (HS PM-S 40 DCS,1082305)

Figure 69 VESA display mount



10.8 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
  - Digital printing: photorealistic designs and color gradients, even for small quantities
- **Mechanical processing** of the housing parts

Further information can be found under web code #0685.

10.9 Configurator

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.