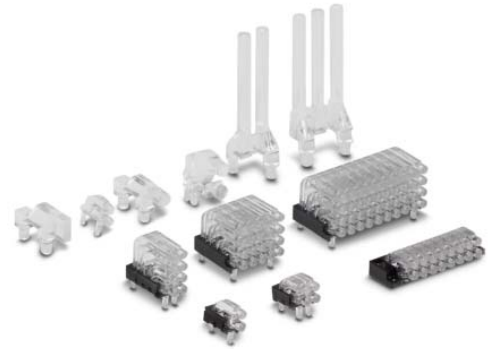


HS LC...

Light guides



Data sheet
106383_en_06

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1 Description

HS LC ... light guides are suitable for use with the following housing ranges from Phoenix Contact: ME, ME MAX, ME-IO, ME PLC, BC, EH, ECS and HC-ALU.

All of the light guides presented here are protected against ESD. The respective ESD protection is specified in the product details.

After the soldering process, the light guides are pressed into assembly boreholes and by this means secured in place. To ensure that the light guides are integrated into the housing with perfect fit, we offer machining services.

For each product, we recommend specific SMD LEDs from OSRAM. These LEDs are suitable for fully automated fitting.

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It can be downloaded at phoenixcontact.net/products.



This data sheet is valid for all products listed on the following page:

2 Ordering data

Light guides for housing

Description					Type	Order No.	Pcs./Pkt.
Alignment	C*	Size	Number of displays	Pitch			
Vertical		ø 3 mm	2 rows x 1 column	5.08	HS LC-V-D3/ R2xC1-5,08	2202311	200
Vertical		ø 3 mm	3 rows x 1 column	5.08	HS LC-V-D3/ R3xC1-5,08	2202312	200
Horizontal		ø 3 mm	1 row x 1 column	–	HS LC-H-D3/ R1xC1	2202313	100
Horizontal		5 x 2 mm	1 row x 1 column	–	HS LC-H-5x2/ R1xC1	2202314	100
Horizontal		ø 3 mm	2 rows x 1 column	5.08	HS LC-H-D3/ R2xC1-5,08	2202315	100
Horizontal		ø 2 mm	2 rows x 1 column	2.54	HS LC-H-D2/ R2xC1-2,54	2202316	100
Horizontal	✓	ø 2 mm	2 rows x 1 column	2.54	HS LC-H-D2C/ R2xC1-2,54	1036658	100
Horizontal		ø 2 mm	2 rows x 2 columns	2.54	HS LC-H-D2/ R2xC2-2,54	2202317	100
Horizontal	✓	ø 2 mm	2 rows x 2 columns	2.54	HS LC-H-D2C/ R2xC2-2,54	1043044	100
Horizontal		ø 2 mm	2 rows x 5 columns	2.54	HS LC-H-D2/ R2xC5-2,54	2202318	100
Horizontal	✓	ø 2 mm	2 rows x 5 columns	2.54	HS LC-H-D2C/ R2xC5-2,54	1071310	100
Horizontal		ø 2 mm	2 rows x 10 columns	2.54	HS LC-H-D2/ R2xC10-2,54	2202319	100
Horizontal	✓	ø 2 mm	2 rows x 10 columns	2.54	HS LC-H-D2C/ R2xC10-2,54	1071314	100
Horizontal		ø 2 mm	4 rows x 2 columns	2.54	HS LC-H-D2/ R4xC2-2,54	2202320	100
Horizontal	✓	ø 2 mm	4 rows x 2 columns	2.54	HS LC-H-D2C/ R4xC2-2,54	1071316	100
Horizontal		ø 2 mm	4 rows x 5 columns	2.54	HS LC-H-D2/ R4xC5-2,54	2202321	100
Horizontal	✓	ø 2 mm	4 rows x 5 columns	2.54	HS LC-H-D2C/ R4xC5-2,54	1071318	100
Horizontal		ø 2 mm	4 rows x 9 columns	2.54	HS LC-H-D2/ R4xC9-2,54	2202322	100
Horizontal	✓	ø 2 mm	4 rows x 9 columns	2.54	HS LC-H-D2C/ R4xC9-2,54	1071321	100
Horizontal		ø 2 mm	4 rows x 10 columns	2.54	HS LC-H-D2/ R4xC10-2,54	2202323	100
Horizontal	✓	ø 2 mm	4 rows x 10 columns	2.54	HS LC-H-D2C/ R4xC10-2,54	1071329	100
Vertical		ø 5.2 mm	1 row x 1 column	–	HS LC-V-T-D4X5,2S-45	1082300	1
Flexible		ø 6 mm	1 row x 1 column	–	HS LC-F-T-6X3-150	1082301	1
Signal light		ø 5 mm	1 row x 1 column	–	HS LCA-RGB-10X5-L	1082299	1

* C = The tops of the press-in pegs are conical to facilitate installation.

3 HS LC-V-D3/ R ... light guides

This light guide system with a vertical design provides a 3 mm circle of light on the front panel by means of an LED. Press-in pegs secure the light guides on the PCB.

The light guides are suitable for use with the BC housing range from Phoenix Contact.



Description				Type	Order No.	Pcs./Pkt.
Alignment	Size	Quantity	Pitch			
Vertical	ø 3 mm	2 rows x 1 column	5.08	HS LC-V-D3/ R2xC1-5,08	2202311	200
Vertical	ø 3 mm	3 rows x 1 column	5.08	HS LC-V-D3/ R3xC1-5,08	2202312	200

General data

Material of the light guide	PC clear UL94
Ambient temperature	-40°C ... +85°C
ESD protection	<12 kV

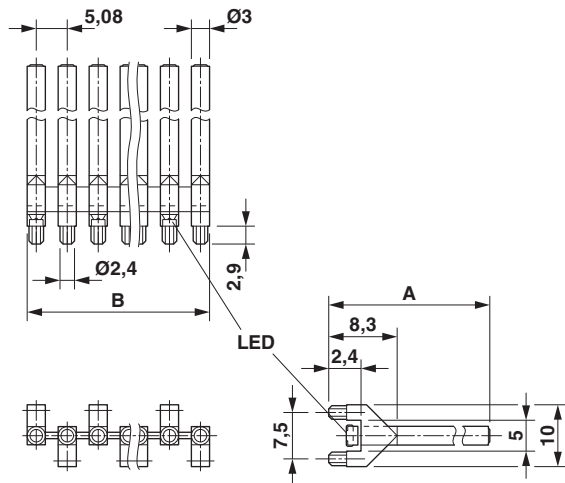


Figure 1 Dimensional drawing of HS LC-V-D3/ ...-5,08

Dimensions for	A	B
2202311	32 mm	8.08 mm
2202312	32 mm	13.16 mm

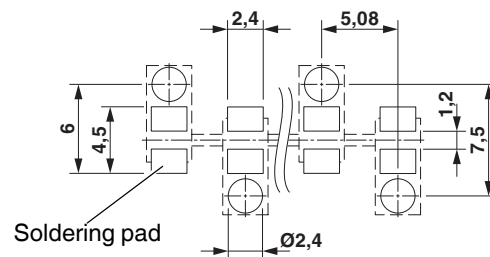


Figure 2 Recommended layout for HS LC-V-D3/...-5,08

We recommend the use of the TOPLED design, an SMD LED with integrated reflector from OSRAM.

- LS T670 LS T679 LS T676 LT T673
- LY T670 LY T679 LO T676 LW T673
- LG T670 LG T679 LY T676
- LSG T670

4 HS LC-H-D3/ R1... and HS LC-H-5X2/ R1... light guides

The light is guided to the front panel in the form of a 2 x 5 mm rectangular light guide or Ø 3 mm circular light guide, parallel to the PCB. This light guide is secured on the PCB by two press-in pegs.

The light guides are suitable for use with the housing ranges ME, ME MAX, ME-IO, ME-PLC, BC 17,8 and EH from Phoenix Contact.



Description				Type	Order No.	Pcs./Pkt.
Alignment	Size	Quantity	Pitch			
Horizontal	Ø 3 mm	1 row x 1 column	-	HS LC-H-D3/ R1xC1	2202313	100
Horizontal	5 x 2 mm	1 row x 1 column	-	HS LC-H-5x2/ R1xC1	2202314	100

General data

Material of the light guide

PMMA clear UL94

Ambient temperature

-40°C ... +85°C

ESD protection

<12 kV

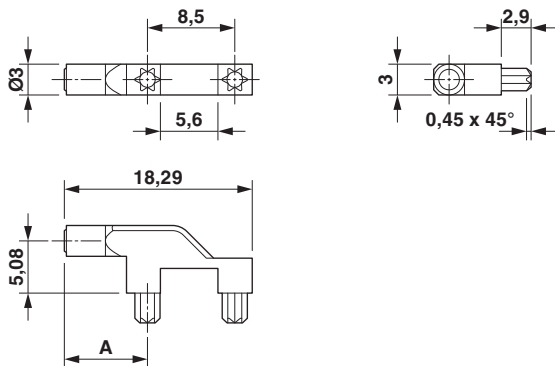


Figure 3 Dimensional drawing of HS LC-H-D3/ R1xC1

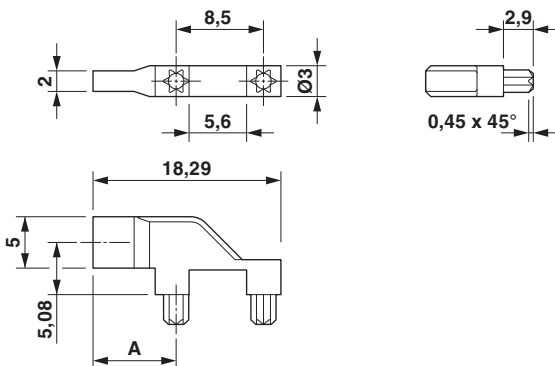


Figure 4 Dimensional drawing of HS LC-H-5x2/ R1xC1

Dimensions for	A
2202313 + 2202314	8.1 mm

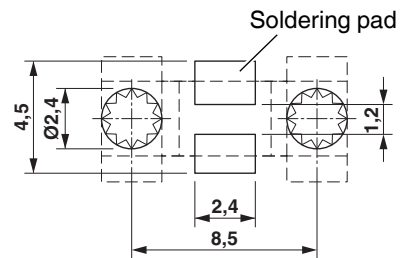


Figure 5 Recommended layout for HS LC-H-D3/...

We recommend the use of the TOPLED design, an SMD LED with integrated reflector from OSRAM.

- LS T670 LS T679 LS T676 LT T673
- LY T670 LY T679 LO T676 LW T673
- LG T670 LG T679 LY T676
- LSG T670

5 HS LC-H-D3/ R2 ... 5,08 light guides

The double display has a spherical illumination surface with $\varnothing 3$ mm diameter. Press-in pegs secure the light guides on the PCB.

The light guides are suitable for use with the housing ranges ME, ME MAX, ME-IO, ME-PLC, BC 17,8 and EH from Phoenix Contact.



Description				Type	Order No.	Pcs./Pkt.
Alignment	Size	Quantity	Pitch			
Horizontal	$\varnothing 3$ mm	2 rows x 1 column	5.08	HS LC-H-D3/ R2xC1-5,08	2202315	100

General data

Material of the light guide	PC clear UL94
Ambient temperature	-40°C ... +85°C
ESD protection	6.5 kV

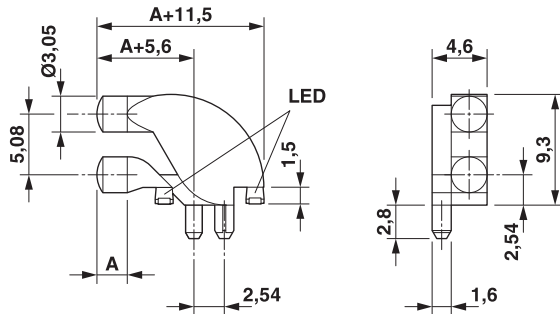


Figure 6 Dimensional drawing of HS LC-H-D3/ R2xC1-5,08

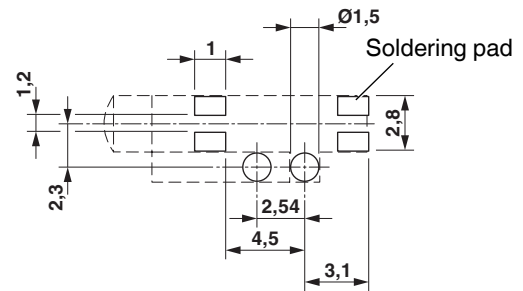


Figure 7 Recommended layout for HS LC-H-D3/ R2xC1-5,08

Dimensions for A

2202315	2.5 mm
---------	--------

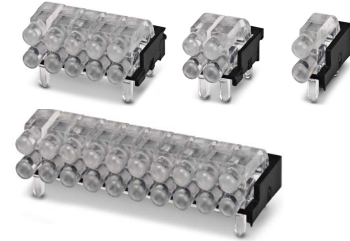
We recommend the use of the Mini-TOPLED design, an SMD LED from OSRAM with white SMT housing.

LS M670	LS M676	LY M676
LG M670	LO M676	LT M673

6 HS LC-H-D2/ R2 ... 2,54 light guides

This light guide element with double rows contains up to 20 possible illumination surfaces. Press-in pegs secure the light guide element on the PCB. The system features a lens to prevent glare. This also makes mixed colors possible.

The light guides are suitable for use with the housing ranges ME, ME MAX, ME-IO, ME-PLC, BC 17,8 and EH from Phoenix Contact.



Description					Type	Order No.	Pcs./Pkt.
Alignment	C*	Size	Quantity	Pitch			
Horizontal		ø 2 mm	2 rows x 1 column	2.54	HS LC-H-D2/ R2xC1-2,54	2202316	100
Horizontal	✓	ø 2 mm	2 rows x 1 column	2.54	HS LC-H-D2C/ R2xC1-2,54	1036358	100
Horizontal		ø 2 mm	2 rows x 2 columns	2.54	HS LC-H-D2/ R2xC2-2,54	2202317	100
Horizontal	✓	ø 2 mm	2 rows x 2 columns	2.54	HS LC-H-D2C/ R2xC2-2,54	1043044	100
Horizontal		ø 2 mm	2 rows x 5 columns	2.54	HS LC-H-D2/ R2xC5-2,54	2202318	100
Horizontal	✓	ø 2 mm	2 rows x 5 columns	2.54	HS LC-H-D2C/ R2xC5-2,54	1071310	100
Horizontal		ø 2 mm	2 rows x 10 columns	2.54	HS LC-H-D2/ R2xC10-2,54	2202319	100
Horizontal	✓	ø 2 mm	2 rows x 10 columns	2.54	HS LC-H-D2C/ R2xC10-2,54	1071314	100

* C = The tops of the press-in pegs are conical to facilitate installation, e.g., into ME-IO housings.

General data

Material of the light guide	PC clear UL94
Material of lens	PC black UL94
Ambient temperature	-40°C ... +85°C
ESD protection	<8 kV

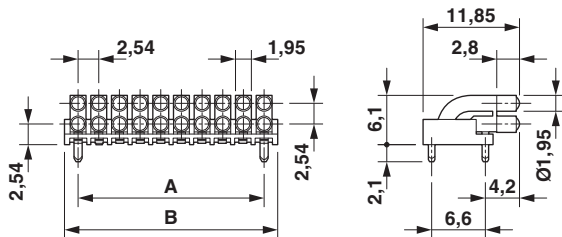


Figure 8 Dimensional drawing of HS LC-H-D2/...-2,54

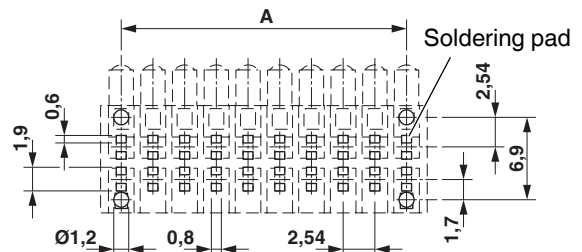


Figure 9 Recommended layout for HS LC-H-D2/...-2,54

Dimensions for	A	B
2202316	-	3.16 mm
2202317	2.54 mm	5.70 mm
2202318	10.16 mm	13.32 mm
2202319	22.86 mm	26.20 mm

The light guide block is designed for use with CHIPLEDS, design 0603, from OSRAM.

LG Q971	LS Q976
LY Q971	LY Q976
	LO Q976

7 HS LC-H-D2/ R4 ... 2,54 light guides

This light guide element with four rows contains up to 40 possible illumination surfaces. Press-in pegs secure the light guide element on the PCB. The system features a lens to prevent glare. This also makes mixed colors possible.

The light guides are suitable for use with the housing ranges ME, ME MAX, ME-IO, ME-PLC, BC 17,8 and EH from Phoenix Contact.



Description					Type	Order No.	Pcs./Pkt.
Alignment	C*	Size	Quantity	Pitch			
Horizontal		ø 2 mm	4 rows x 2 columns	2.54	HS LC-H-D2/ R4xC2-2,54	2202320	100
Horizontal	✓	ø 2 mm	4 rows x 2 columns	2.54	HS LC-H-D2C/ R4xC2-2,54	1071316	100
Horizontal		ø 2 mm	4 rows x 5 columns	2.54	HS LC-H-D2/ R4xC5-2,54	2202321	100
Horizontal	✓	ø 2 mm	4 rows x 5 columns	2.54	HS LC-H-D2C/ R4xC5-2,54	1071318	100
Horizontal		ø 2 mm	4 rows x 9 columns	2.54	HS LC-H-D2/ R4xC9-2,54	2202322	100
Horizontal	✓	ø 2 mm	4 rows x 5 columns	2.54	HS LC-H-D2C/ R4xC5-2,54	1071321	100
Horizontal		ø 2 mm	4 rows x 10 columns	2.54	HS LC-H-D2/ R4xC10-2,54	2202323	100
Horizontal	✓	ø 2 mm	4 rows x 10 columns	2.54	HS LC-H-D2C/ R4xC10-2,54	1071329	100

* C = The tops of the press-in pegs are conical to facilitate installation, e.g., into ME-IO housings.

General data

Material of the light guide	PC clear UL94
Material of lens	PC black UL94
Ambient temperature	-40°C ... +85°C
ESD protection	<8 kV

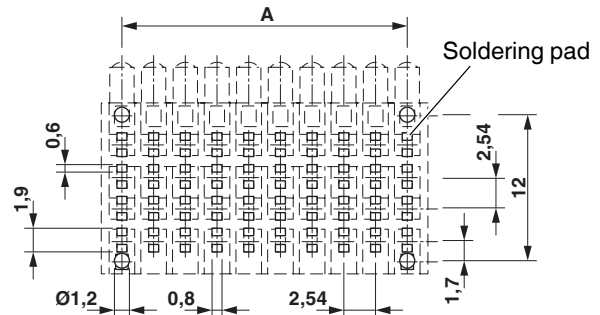
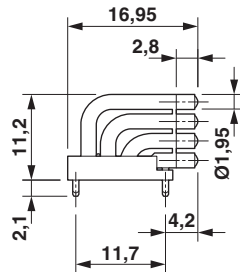
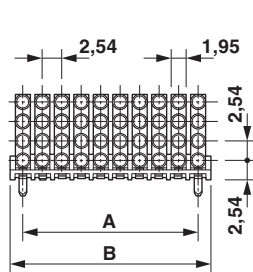


Figure 10 Dimensional drawing of HS LC-H-D2/ ...-2,54

Dimensions for	A	B
2202320	2.54 mm	5.70 mm
2202321	10.16 mm	13.32 mm
2202322	20.32 mm	23.48 mm
2202323	22.86 mm	26.20 mm

Figure 11 Recommended layout for HS LC-H-D2/ ...-2,54

The light guide block is designed for use with CHIPLEDs, design 0603, from OSRAM.

LG Q971 LS Q976
 LY Q971 LY Q976
 LO Q976

8 HS LC-V-T light guide

This light guide system with a vertical design has a spherical illumination surface. Once the light guide has been pressed or glued into the front plate of a housing, it achieves IP68 degree of protection.

The light guides are particularly suitable for use with the ECS and HC-ALU housing ranges from Phoenix Contact.



Description				Type	Order No.	Pcs./Pkt.
Alignment	Size	Quantity	Pitch			
Vertical	ø 5.2 mm	1 row x 1 column	–	HS LC-V-T-D4X5,2-45	1082300	1

General data

Material	PC clear UL94
Ambient temperature	-20°C ... +50°C
ESD protection	<4 kV

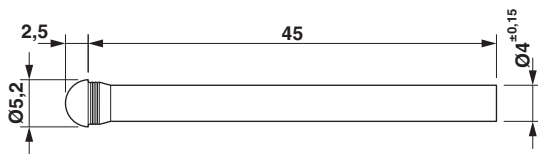


Figure 12 Dimensional drawing of HS LC-V-T

We recommend the use of the TOPLED design, an SMD LED with integrated reflector from OSRAM.

LS T670
LSG T676
LY T676

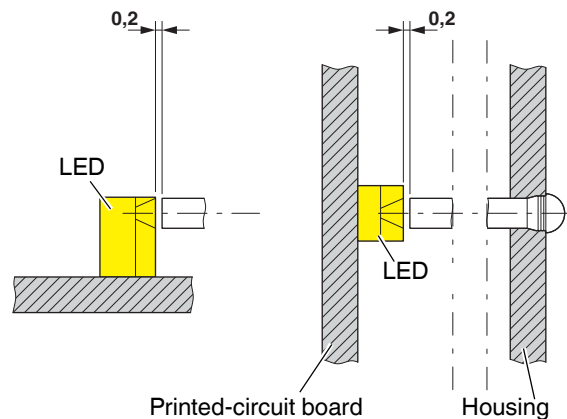


Figure 13 Installation example

Minimum thickness of the front plate: 1.5 mm

After drilling, ream the assembly borehole to $\text{Ø } 4.6 \text{ mm}^{\text{H7}}$.
Dry-install the light guide by pressing it in vertically.

As an alternative, you can glue in the light guide, e.g., using LOCTITE 460. To accelerate curing, you can use LOCTITE SF 7455 as an activator.

9 HS LC-F-T light guide

This three-part, flexible light guide system shows the light of an LED. The lens is pressed or glued into the front plate of a housing.

The light guides are particularly suitable for use with the ECS and HC-ALU housing ranges from Phoenix Contact.



Description				Type	Order No.	Pcs./Pkt.
Alignment	Size	Quantity	Pitch			
Flexible	ø 6 mm	1 row x 1 column	-	HS LC-F-T-6X3-150	1082301	1

General data

Material

Housing: PC black UL94

Light guide: PUR

Lens: PC clear UL94

Ambient temperature

-40°C ... +85°C

ESD protection

<12 kV

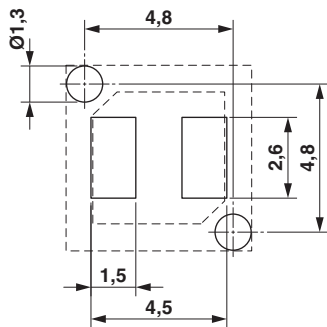


Figure 14 Recommended layout for HS LC-F-T

Maximum LED height: 2.1 mm

We recommend the use of the TOPLED design, an SMD LED with integrated reflector from OSRAM.

LS T670

LSG T676

LY T676

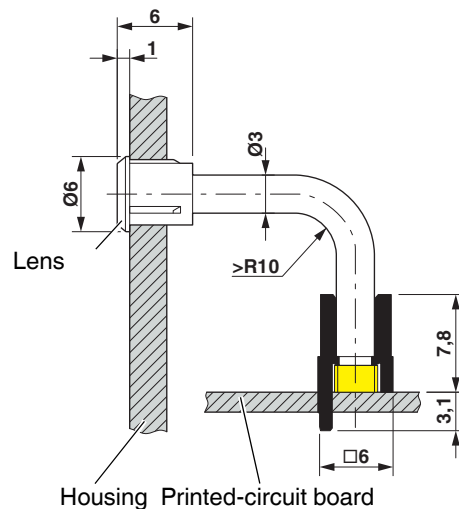


Figure 15 Installation example

Dry-install the lens by pressing it vertically into the Ø 5.5 mm assembly borehole.

As an alternative, you can glue in the light guide, e.g., using LOCTITE 460. To accelerate curing, you can use LOCTITE SF 7455 as an activator.

10 HS LCA LED display

This LED display with a vertical design has a spherical illumination surface. Once the LED display has been pressed or glued into the front plate of a housing, it achieves IP68 degree of protection.

The signal lights are particularly suitable for use with the ECS and HC-ALU housing ranges from Phoenix Contact.



Description				Type	Order No.	Pcs./Pkt.
Alignment	Size	Quantity	Pitch			
Vertical	ø 5 mm	1 row x 1 column	-	HS LCA-RGB-10X5-L	1082299	1

General data

Material

Housing: PC black UL94

LED display: PC UL94

Ambient temperature

-20°C ... +80°C

ESD protection

<12 kV

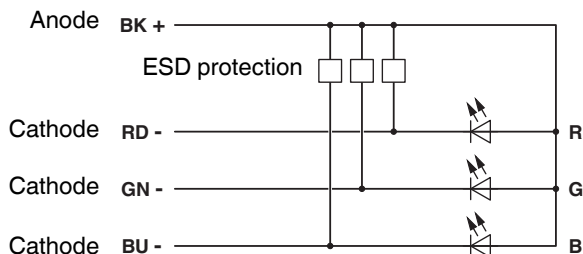
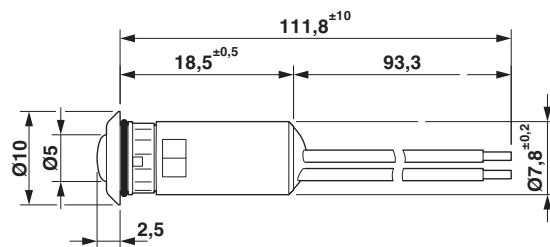
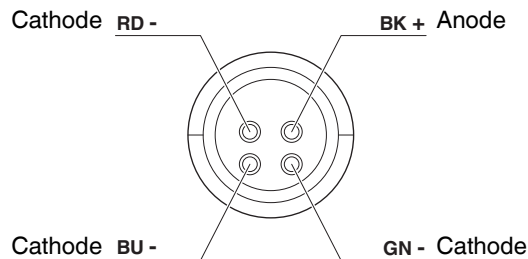


Figure 17 Dimensional drawing of HS LCA

Minimum thickness of the front plate: 1.5 mm

After drilling, ream the assembly borehole to Ø 8 mm^{H7}. Dry-install the LED display by pressing it in vertically.

As an alternative, you can glue in the LED display, e.g., using LOCTITE 460. To accelerate curing, you can use LOCTITE SF 7455 as an activator.

Figure 16 LED connection assignment for HS LCA

We recommend using connector PTSM 0,5/4-PL-2,5 WH, 1709460 from Phoenix Contact.

	Wavelength λ [nm] dominant, at $I = 20 \text{ mA}$	Forward voltage $T = 25^\circ\text{C}, I = 20 \text{ mA}$	
		Typical	Maximum
R Red	624	2.0	2.4
G Green	525	3.5	3.8
B Blue	470	3.5	3.8

11 Positioning light guides in housings

11.1 ME housing range

Installation examples

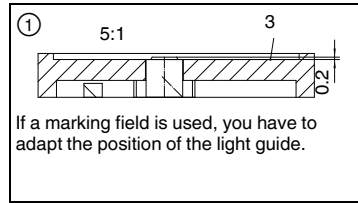
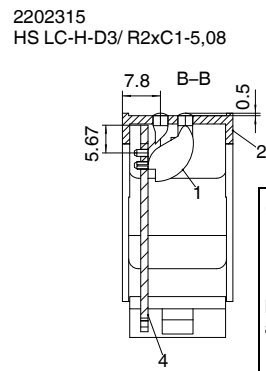
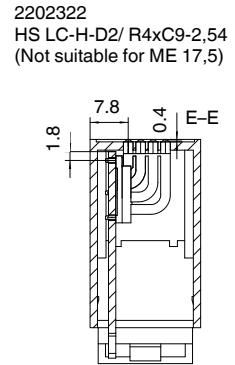
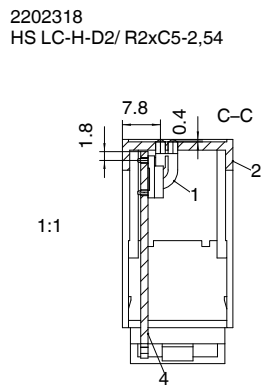
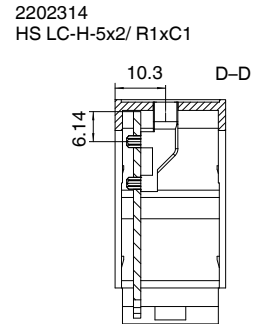
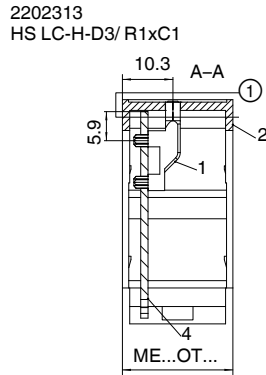
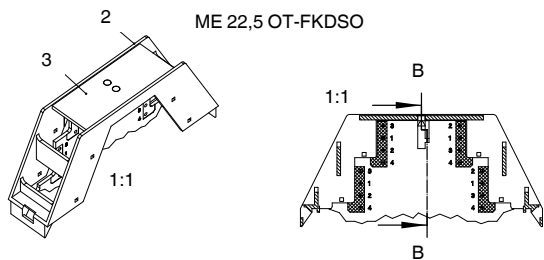
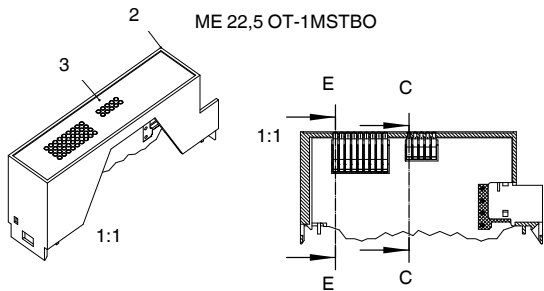
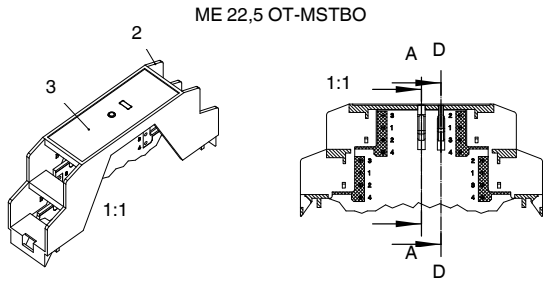
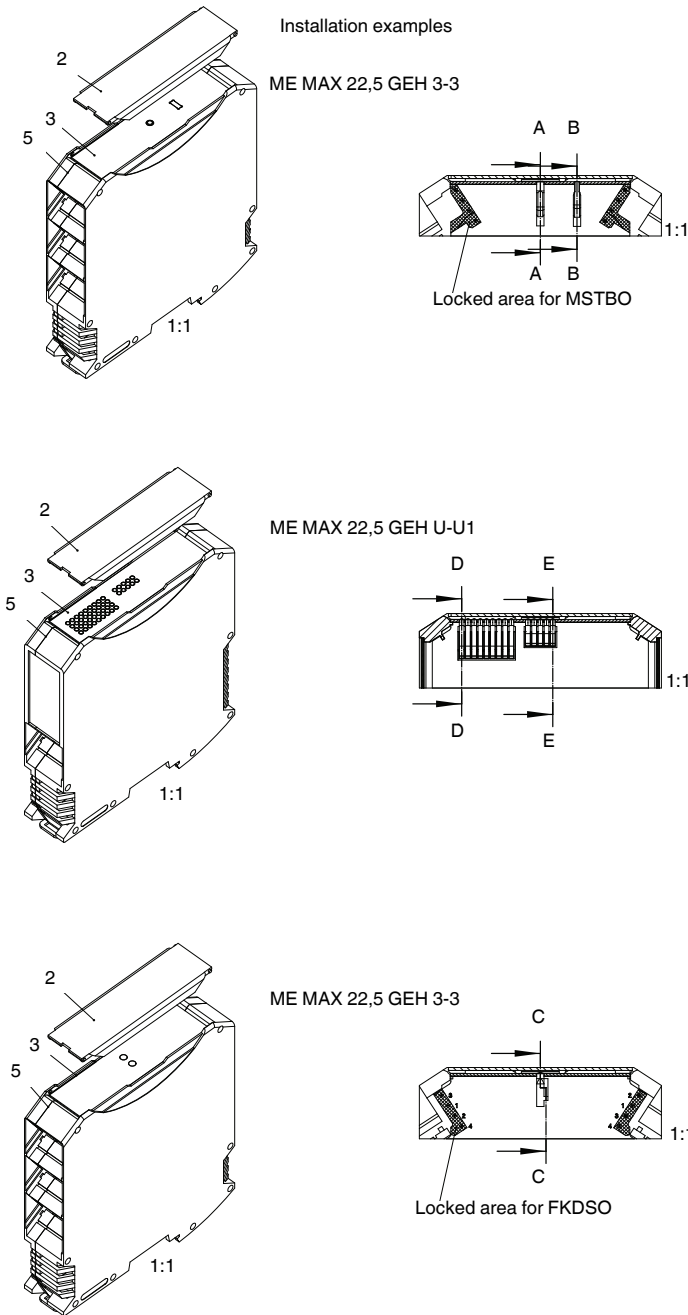


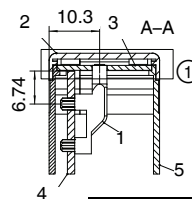
Figure 18 ME 17,5 OT, ME 22,5 OT, ME 35 OT, ME 45 OT, ME 67,5 OT, ME 90 OT

- 1 Light guides
- 2 ME ... OT upper housing part
- 3 Control panel
- 4 Printed-circuit board

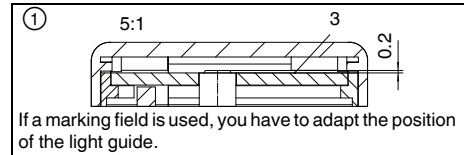
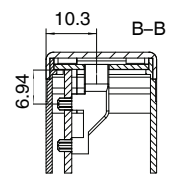
11.2 ME MAX housing range



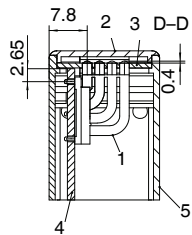
2202313
HS LC-H-D3/ R1xC1



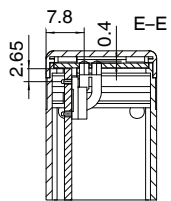
2202314
HS LC-H-5x2/ R1xC1



2202322
HS LC-H-D2/ R4xC9-2,54
Not suitable for ME MAX 17,5



2202318
HS LC-H-D2/ R2xC5-2,54



2202315
HS LC-H-D3/ R2xC1-5,08

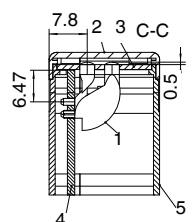


Figure 19 ME MAX 17,5; ME MAX 22,5; ME MAX 35; ME MAX 45; ME MAX 67,5; ME MAX 90

- 1 Light guides
- 2 ME MAX ... DKL housing cover
- 3 Insertion plate, part of the housing cover
- 4 Printed-circuit board
- 5 ME MAX housing

11.3 ME PLC housing range

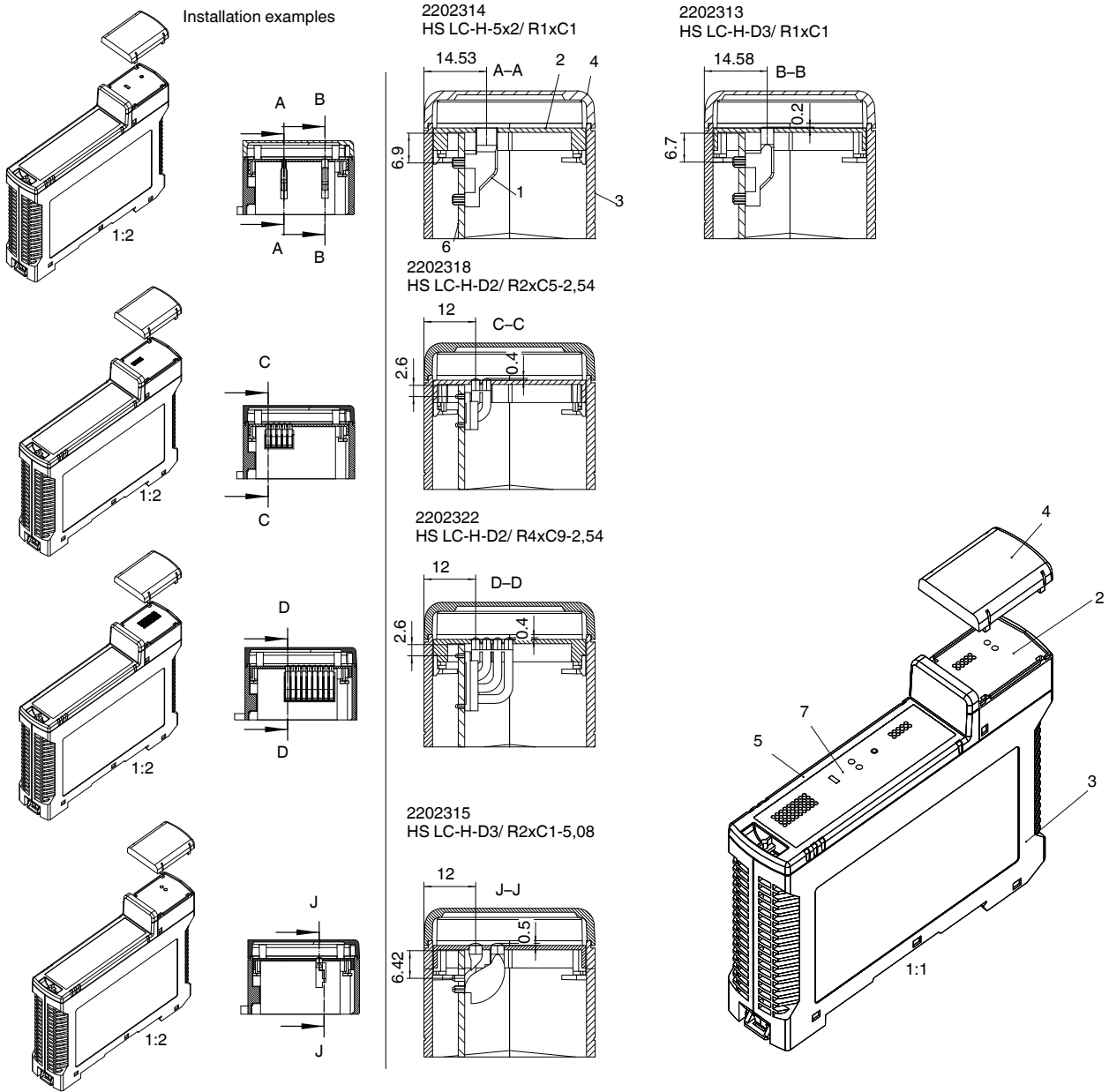


Figure 20 ME PLC (part 1)

- 1 Light guides
- 2 Insertion plate, part of the housing cover
- 3 ME PLC 40 B BUS lower housing part
- 4 ME PLC 40 CS TRANS housing cover
- 5 ME PLC 40 CL housing cover
- 6 Printed-circuit board
- 7 Control panel

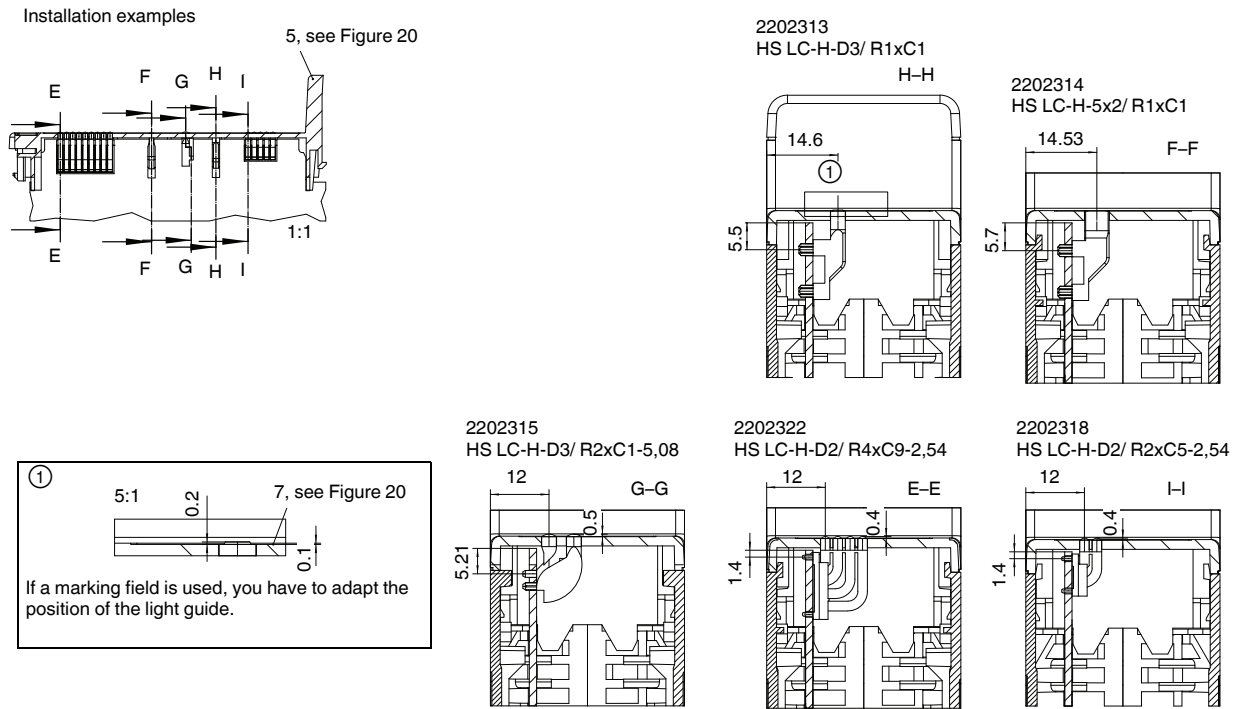


Figure 21 ME PLC (part 2)

11.4 BC 17,8 housing range

Installation example

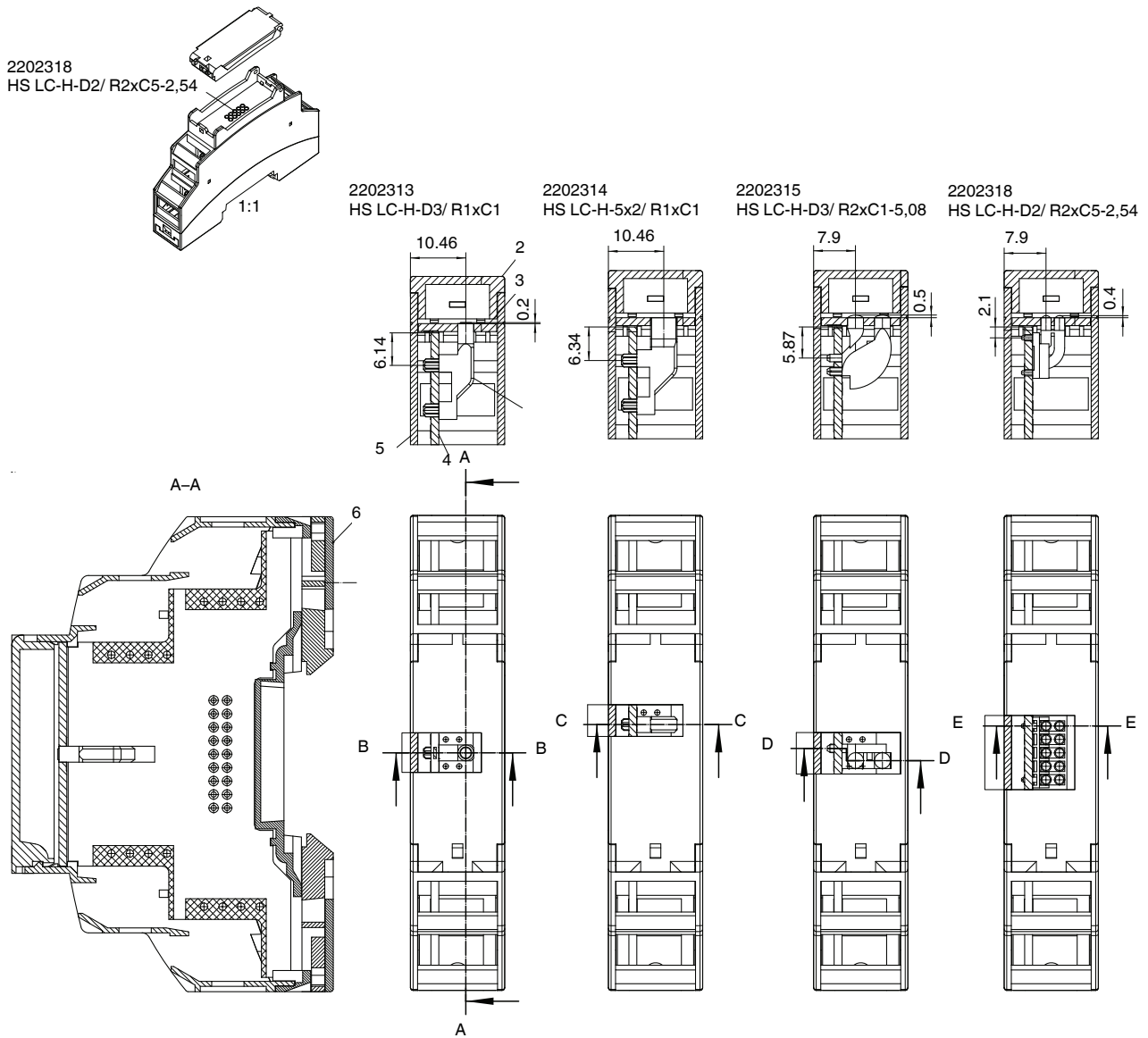


Figure 22 BC 17,8

- 1 Light guides
- 2 BC 17,8 DKL S TRANS housing cover
- 3 Insertion plate, part of the housing cover
- 4 Printed-circuit board
- 5 BC 17,8 OT U22/BC 17,8 OT U11 upper housing part
- 6 BC 17,8 UT HBUS lower housing part

11.5 BC housing range as of an overall width of 35.6 mm

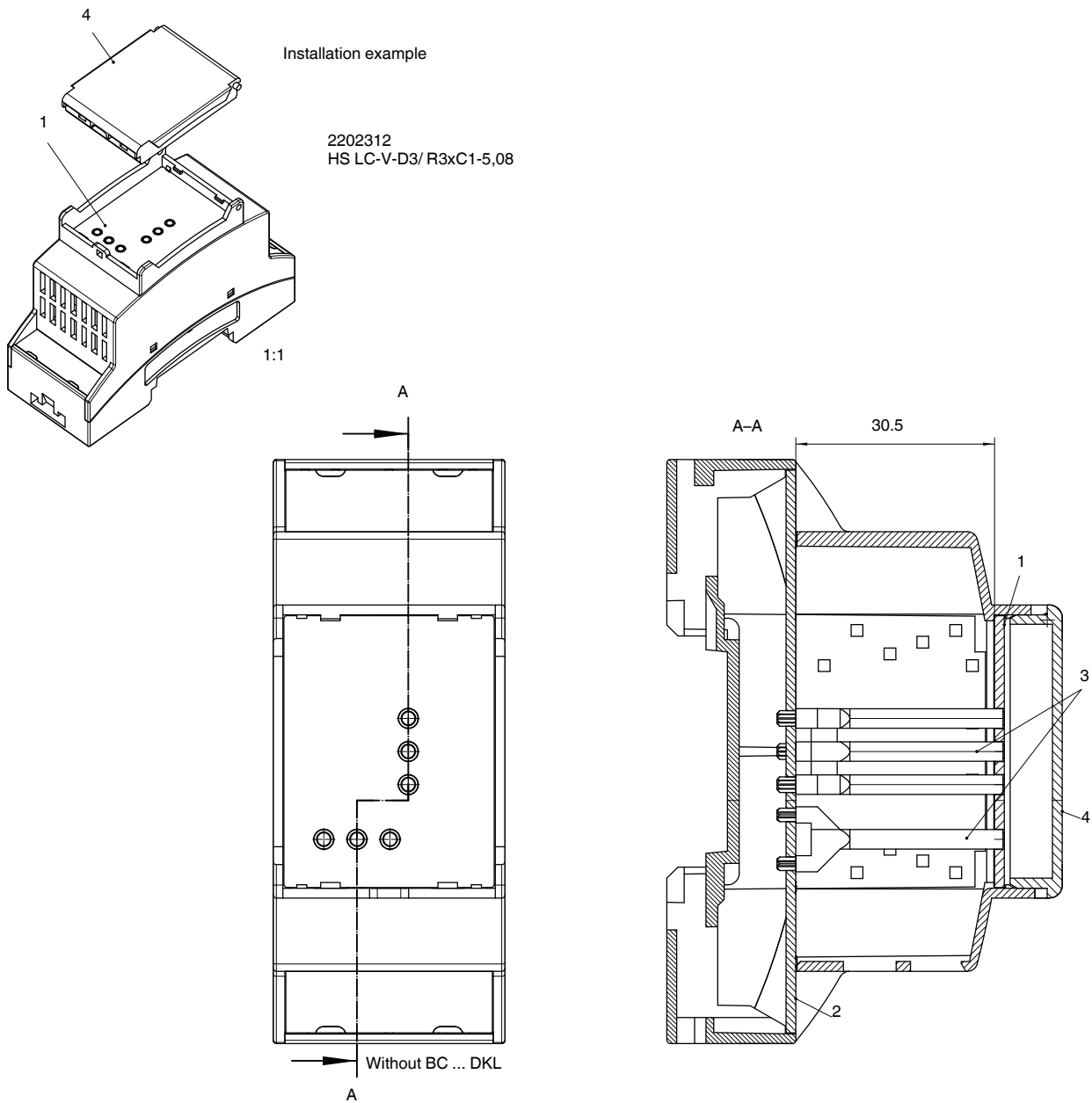


Figure 23 BC 35,6; BC 53,6; BC 71,6; BC 107,6; BC 161,6

- 1 Insertion plate, part of the housing cover
- 2 Printed-circuit board
- 3 Light guides
- 4 BC ... DKL housing cover

11.6 ME-IO 18,8 housing range

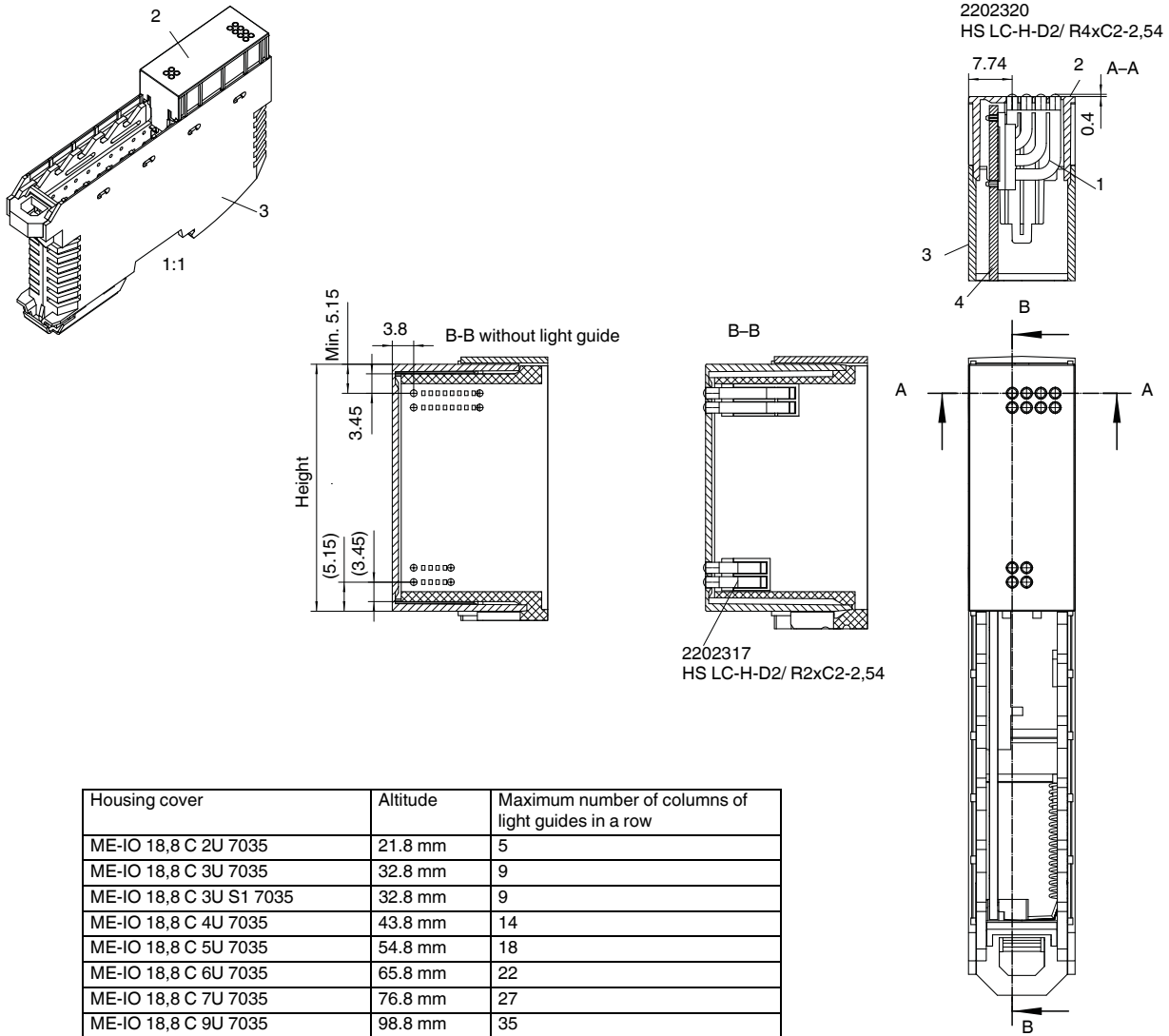


Figure 24 ME-IO 18,8

- 1 Light guides
- 2 ME-IO 18,8 C ...U housing cover
- 3 ME-IO 18,8 B/FE .../9 U TBUS lower housing part
- 4 Printed-circuit board

11.7 ECS housing range

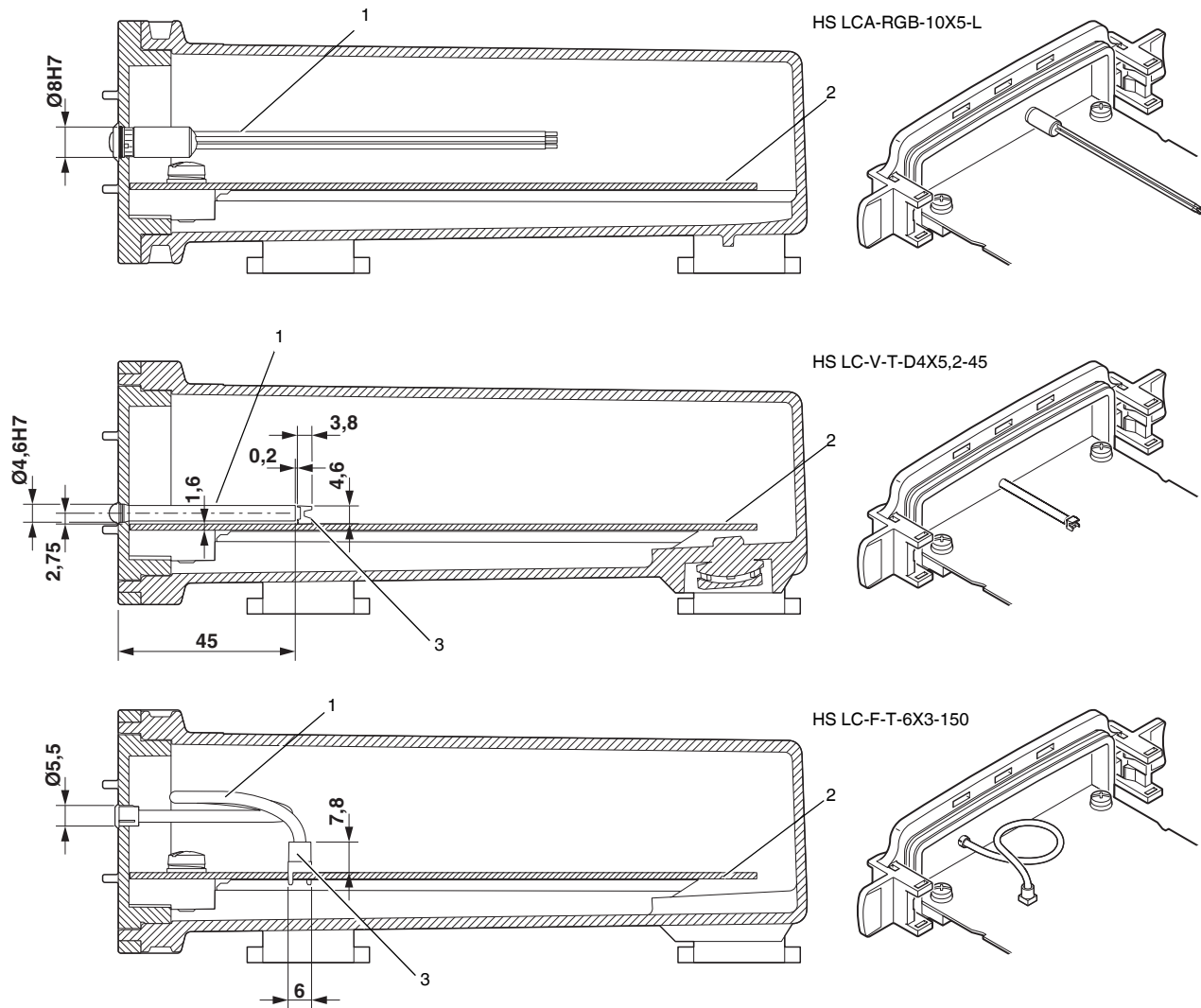


Figure 25 ECS

- 1 Light guides
- 2 Printed-circuit board
- 3 LED