

A

Multi module cooling aggregates

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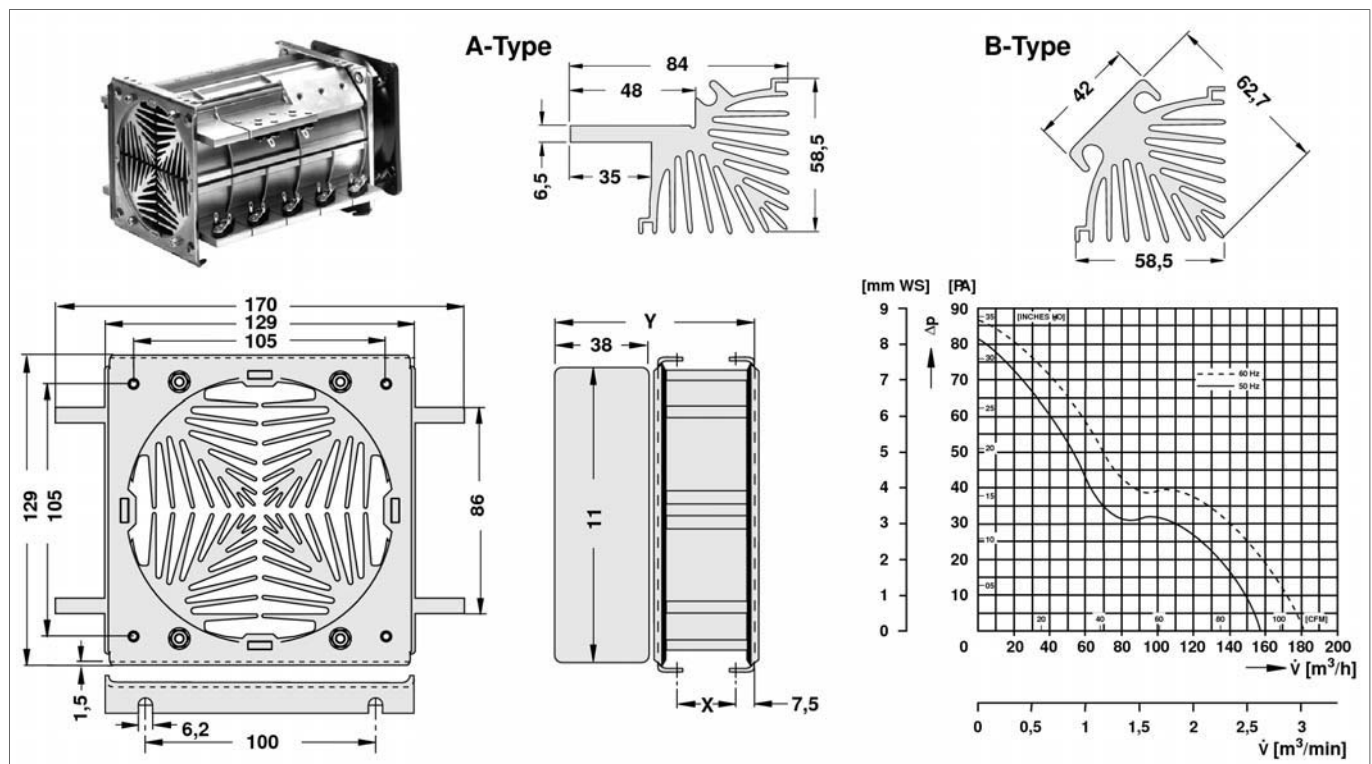
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art. no.	L [mm]	dim. [mm]	
		X	Y
LA 1 01 ...	35.0	26.0	88.6
LA 1 02 ...	71.5	62.5	125.1
LA 1 03 ...	108.0	99.0	161.6
LA 1 04 ...	144.5	135.5	198.1
LA 1 05 ...	181.0	172.0	234.6
LA 1 06 ...	217.5	208.5	271.1
LA 1 07 ...	254.0	245.0	307.6
LA 1 08 ...	290.5	281.5	344.1
LA 1 09 ...	327.0	318.0	380.6
LA 1 10 ...	363.5	354.5	417.1

... for A-types: please add an "A", for B-types: please add a "B".

L: unit lengths of the segments incl. insulation; **X:** mounting distance; **Y:** length of the cooling aggregate incl. fan
24 V DC fan on request

In case of order please use order form.

segments also available in meter length: **art. no. for A-type: LA 1 1000 A; art. no. for B-type: LA 1 1000 B**

Technical data of the fan

type	... 230
dimensions	ebmpapst, ball bearing
voltage	119 x 119 x 38 mm
power input	230 V AC
max. air flow	19 W
temperature range	160 m³/h
noise level	-40 °C ... +85 °C
rated speed	47 dB(A)
weight	2,650 min ⁻¹
failure rate (L₁₀)	550 g
	L ₁₀ > 37.500 h (40 °C)

Other fan types and fan voltages on request.

D 5

Miniature cooling aggregates
Protection grid for axial fans
High capacity cooling aggregat.
Heatsinks with hollow fin profile

→ D 9 - 11
→ D 32
→ D 24 - 27
→ D 28

Order example
Order form
Mounting parts for heatsinks
Vibration dampers

→ D 7
→ D 8 - 9
→ E 42 - 43
→ E 34

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A

Multi module cooling aggregates

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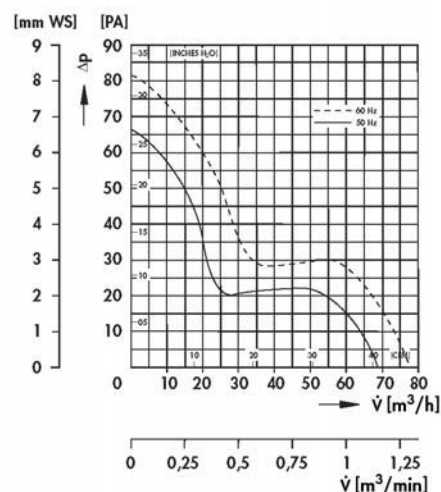
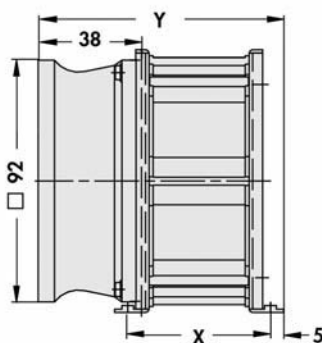
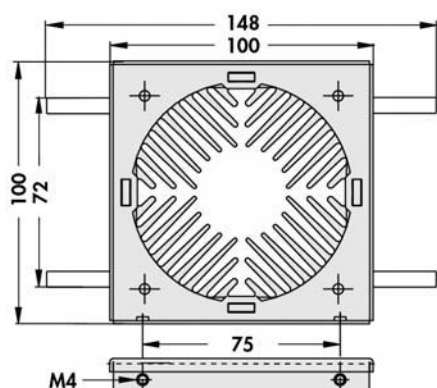
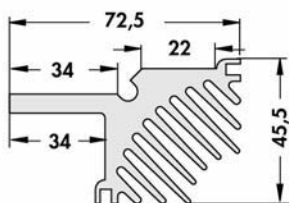
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art. no.	L [mm]	dim. [mm]	
		X	Y
LA 2 01 ...	35.0	54.2	92.0
LA 2 02 ...	71.5	90.7	128.5
LA 2 03 ...	108.0	127.2	165.0
LA 2 04 ...	144.5	163.7	201.5
LA 2 05 ...	181.0	200.2	238.0
LA 2 06 ...	217.5	236.7	274.5
LA 2 07 ...	254.0	273.2	311.0
LA 2 08 ...	290.5	309.7	347.5
LA 2 09 ...	327.0	346.2	384.0
LA 2 10 ...	363.5	382.7	420.5

L: unit lengths of the segments incl. insulation; **X:** mounting distance; **Y:** length of the cooling aggregate incl. fan
24 V DC fan on request

In case of order please use order form.

segments also available in meter length: **art. no. for A-type: LA 1 1000 A; art. no. for B-type: LA 2 1000 B**

Technical data of the fan

	... 230
type	ebmpapst, ball bearing
dimensions	92 x 92 x 38 mm
voltage	230 V AC
power input	12 W
max. air flow	75 m³/h
temperature range	-40 °C ... +75 °C
noise level	37 dB(A)
rated speed	2,700 min ⁻¹
weight	420 g
failure rate (L₁₀)	L ₁₀ > 52.500 h (40 °C)

Other fan types and fan voltages on request.

D 7

Miniature cooling aggregates
Protection grid for axial fans
High capacity cooling aggregat.
Heatsinks with hollow fin profile

→ D 9 - 11
→ D 32
→ D 24 - 27
→ D 28

Order example
Order form
Mounting parts for heatsinks
Vibration dampers

→ D 7
→ D 8 - 9
→ E 42 - 43
→ E 34

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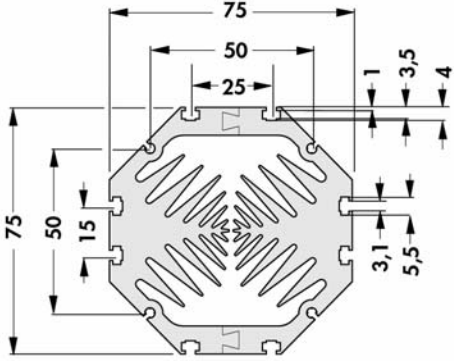

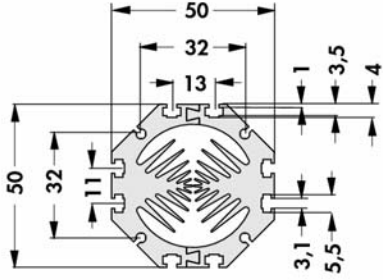
L

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Miniature cooling aggregates

- made for dissipation of high power within an very small space
- approximate length is optimised to the fan motor
- slide-nut channels for M3 nuts for mounting the transistors and circuit boards

art. no. LAM 1		 <p> $\text{Length: } 140 \text{ mm}$ $\text{Thermal resistance: } 0,3 \text{ K/W}$ </p>
art. no. LAM 2		 <p> $\text{Length: } 100 \text{ mm}$ $\text{Thermal resistance: } 0,73 \text{ K/W}$ </p>

surface: clear anodised

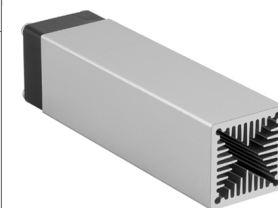
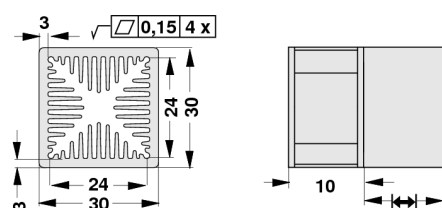
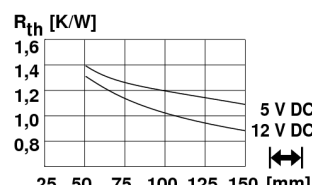
Technical data of the fans

	LAM 1	LAM 2
type	ebmpapst 612 NHH-118	ebmpapst 412 F
dimensions	60 x 60 x 25 mm	40 x 40 x 10 mm
voltage	12 V DC	12 V DC
power input	2.9 W	0.7 W
max. air flow	56 m ³ /h	8 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C
noise level	41 dB(A)	22.1 dB(A)
rated speed	6,800 min ⁻¹	5,400 min ⁻¹
weight	66 g	17 g
failure rate (L₁₀)	L ₁₀ > 60.000 h (40 °C)	L ₁₀ > 45.000 h (20 °C)

Other fan types and fan voltages on request.

Miniature cooling aggregates

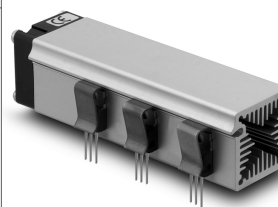
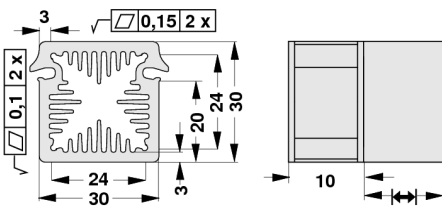
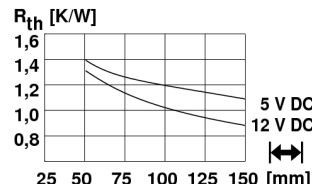
- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor

art. no.			
LAM 3 ...			
please indicate:	... $\left[\right]$... fan type
	50 75 100 125 150 mm		5 = 5 V DC 12 = 12 V DC

other lengths, special designs and processing according to customers requirements

surface: clear anodised, other surface treatment on request!

- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor

art. no.			
LAM 3 K ...			
please indicate:	... $\left[\right]$... fan type
	50 75 100 125 150 mm		5 = 5 V DC 12 = 12 V DC

other lengths, special designs and processing according to customers requirements

surface: clear anodised, other surface treatment on request!

Technical data of the fans

	... 5	... 12
type	Sepa, ball bearing	Sepa, ball bearing
dimensions	30 x 30 x 10 mm	30 x 30 x 10 mm
voltage	5 V DC	12 V DC
max. air flow	6.8 m ³ /h	7.7 m ³ /h
temperature range	-10 °C ... +70 °C	-10 °C ... +70 °C
cur. consumpt.	130 mA	70 mA
noise level	21 dB(A)	23 dB(A)
rated speed	8,500 min ⁻¹	9,100 min ⁻¹
weight	8 g	8 g
failure rate (L₁₀)	L ₁₀ > 95.000 h (20 °C) MTBF > 280.000 h (20 °C)	L ₁₀ > 95.000 h (20 °C) MTBF > 280.000 h (20 °C)

Other fan types and fan voltages on request.

Hole pattern
Technical introduction
Lamella heatsinks

→ A 21
→ A 2 - 7
→ A 128

Insulating clamping parts
Mounting material for semiconduct.
Mounting pads for transistors
Thermal conductive material

→ E 38
→ E 37 - 41
→ E 40
→ E 2 - 15

D 10

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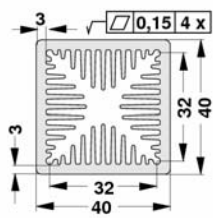
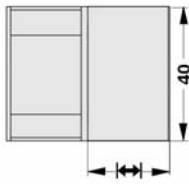
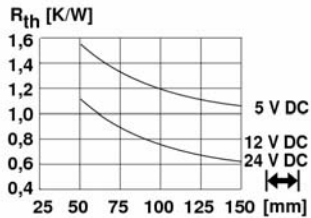

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Miniature cooling aggregates


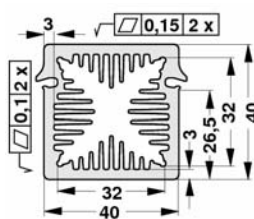
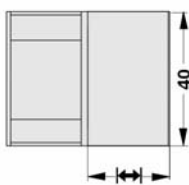
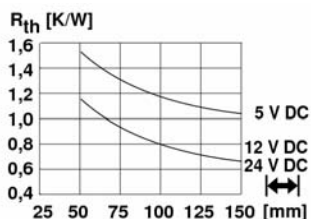

- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor

art. no.				
LAM 4 ...				
please indicate:	... 		... fan type	
	50 75 100 125 150 mm		5 = 5 V DC	
			12 = 12 V DC	
			24 = 24 V DC	

special designs and processing according to customers requirements

surface: clear anodised, other surfaces treatment on request!

- mit Nute für Transistorhaltefeder THFU → A 117...
- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor

art. no.				
LAM 4 K ...				
please indicate:	... 		... fan type	
	50 75 100 125 150 mm		5 = 5 V DC	
			12 = 12 V DC	
			24 = 24 V DC	

special designs and processing according to customers requirements

surface: clear anodised, other surfaces treatment on request!

Technical data of the fans

	... 5	... 12	... 24
type	ebmpapst 405	ebmpapst 412 JHH	ebmpapst 414 JHH
dimensions	40 x 40 x 20 mm	40 x 40 x 25 mm	40 x 40 x 25 mm
voltage	5 V DC	12 V DC	24 V DC
power input	0.9 W	3.3 W	3.6 W
max. air flow	10 m ³ /h	24 m ³ /h	24 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +60 °C	-20 °C ... +60 °C
noise level	18 dB(A)	46 dB(A)	46 dB(A)
rated speed	6,000 min ⁻¹	13,000 min ⁻¹	13,000 min ⁻¹
weight	27 g	50 g	50 g
failure rate (L₁₀)	L ₁₀ > 50.000 h (40 °C) L ₁₀ > 20.000 h (tmax)	L ₁₀ > 57.500 h (40 °C) L ₁₀ > 35.000 h (tmax)	L ₁₀ > 57.500 h (40 °C) L ₁₀ > 35.000 h (tmax)

Other fan types and fan voltages on request.

D 11

Thermal conductive material
Mounting material for semiconductor
Mounting pads for transistors
Lock-in transistor fixing spring


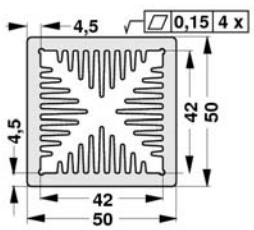
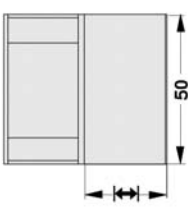
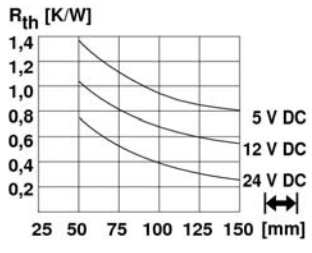

→ E 2 - 15
→ E 37 - 41
→ E 40
→ A 117

Insulating clamping parts
Fluid cooler
Lamella heatsinks

→ E 38
→ A 129 - 132
→ A 127

Miniature cooling aggregates

- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor

art. no.				
LAM 5 ...				
please indicate:	... 		... fan type	
	50 75 100 125 150 mm		5 = 5 V DC	
			12 = 12 V DC	
			24 = 24 V DC	

special designs and processing according to customers requirements
surface: clear anodised, other surfaces treatment on request!

Technical data of the fan

	... 5	... 12	... 24
type	Sepa, ball bearing	Sepa, ball bearing	ebmpapst
dimensions	50 x 50 x 10 mm	50 x 50 x 10 mm	50 x 50 x 15 mm
voltage	5 V DC	12 V DC	24 V DC
max. air flow	10.1 m ³ /h	14.3 m ³ /h	20 m ³ /h
temperature range	-40 °C ... +80 °C	-40 °C ... +80 °C	-20 °C ... +70 °C
cur. consumpt.	50 mA	40 mA	42 mA
noise level	16 dB(A)	25 dB(A)	30 dB(A)
rated speed	3,500 min ⁻¹	4,800 min ⁻¹	5,000 min ⁻¹
weight	19 g	19 g	25 g
failure rate (L₁₀)	L ₁₀ > 95.000 h (20 °C) MTBF > 280.000 h (20 °C)	L ₁₀ > 95.000 h (20 °C) MTBF > 280.000 h (20 °C)	L ₁₀ 50.000 h (20 °C)
alarm output	mit	mit	-

Other fan types and fan voltages on request.

Thermal conductive material → E 2 - 15
 Mounting material for semiconduct. → E 37 - 41
 Mounting pads for transistors → E 40
 Lock-in transistor fixing spring → A 117

Insulating clamping parts → E 38
 Fluid cooler → A 129 - 132
 Lamella heatsinks → A 127

D 12

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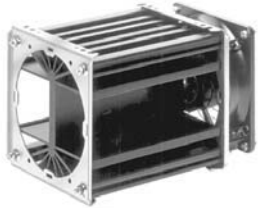
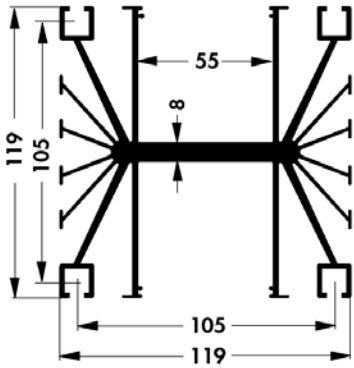
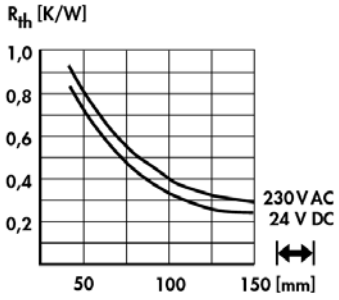

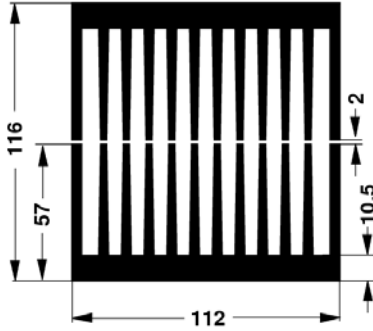
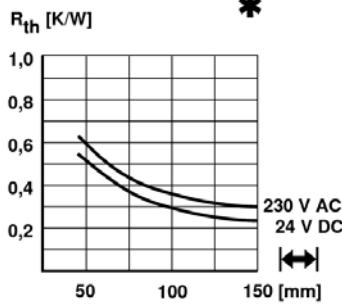

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Cooling aggregates with axial fan

Heatsink-cooling aggregates

- especially suitable for IGBT, SSR, semiconductor modules, high performance transistors etc.
- effective construction with axial fans
- good thermic performance

art. no. LA 4 ...			
art. no. LA 5 ...			
please indicate: ... 		... fan type 24 = 24 V DC 230 = 230 V AC	

- * for one segment
- additional machining according to customer's instructions
- cooling aggregates also available without fans

Technical data of the fans


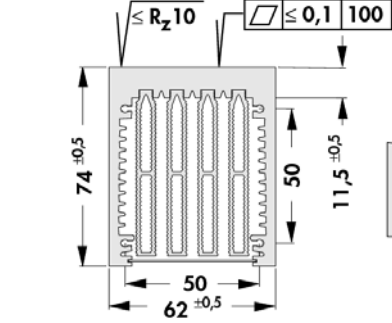
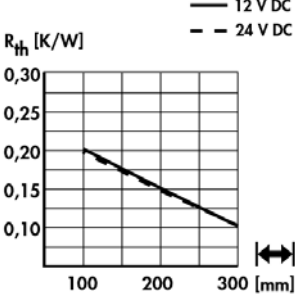

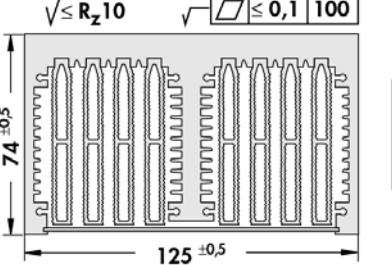
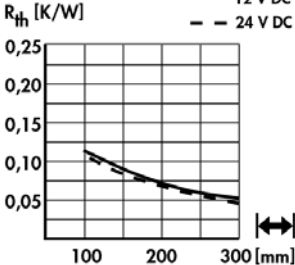

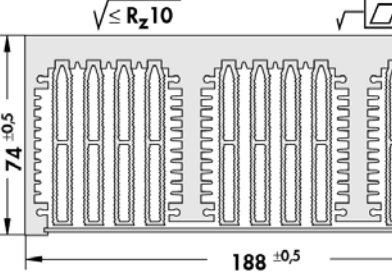
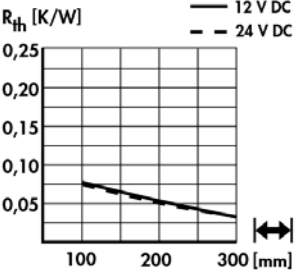
	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
voltage	24 V DC	230 V AC
power input	11 W	19 W
max. air flow	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
noise level	59 dB(A)	47 dB(A)
rated speed	4,400 min ⁻¹	2,650 min ⁻¹
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70.000 h (40 °C)	L ₁₀ > 37.500 h (40 °C)

Other fan types and fan voltages on request.

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- semiconductor mounting surface for milled flat

art. no. LA 6 ...			
art. no. LA 7 ...			
art. no. LA 8 ...			
please indicate: ... \longleftrightarrow		... fan type 12=12 V DC 24=24 V DC	

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60 x 60 x 25 mm	60 x 60 x 25 mm
voltage	12 V DC	24 V DC
power input	2.9 W	3 W
max. air flow	56 m ³ /h	56 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C
noise level	41 dB(A)	41 dB(A)
rated speed	6,800 min ⁻¹	6,850 min ⁻¹
weight	66 g	66 g
failure rate (L₁₀)	L ₁₀ > 60.000 h (40 °C)	L ₁₀ > 60.000 h (40 °C)

Other fan types and fan voltages on request.

Miniature cooling aggregates
Protection grid for axial fans
Heatsinks for Solid State Relay
High capacity heatsinks

→ D 9 - 11
→ D 32
→ A 12
→ A 57 - 58

Special heatsink design
Hole pattern
Standard aluminium profiles
Technical introduction

→ A 133 - 134
→ A 21
→ A 133 - 134
→ A 2 - 7

D 14

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Cooling aggregates with axial fan


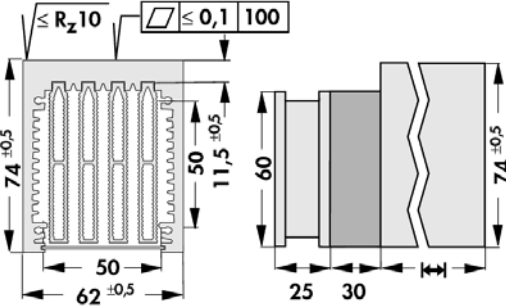
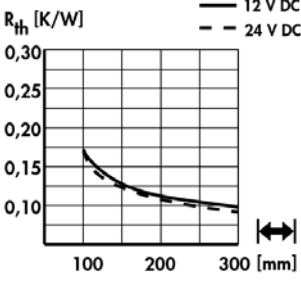

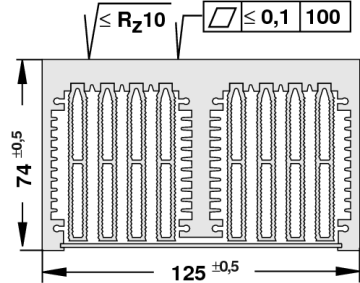
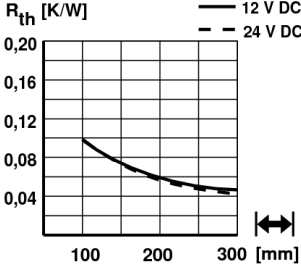

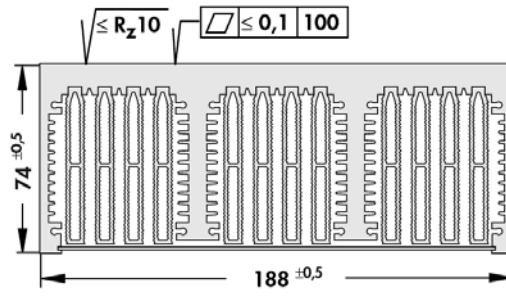
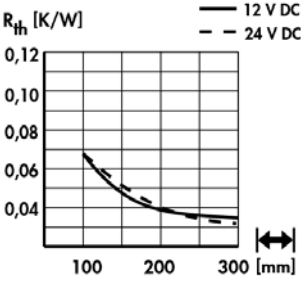

B

Hollow-fin cooling aggregates

- with air flow chamber
- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- semiconductor mounting surface milled flat

C

D

art. no. LA V 6 ...			
art. no. LA V 7 ...			
art. no. LA V 8 ...			
please indicate: ... 		... fan type 12=12 V DC 24=24 V DC	

E

F

G

H

I

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60 x 60 x 25 mm	60 x 60 x 25 mm
voltage	12 V DC	24 V DC
power input	2.9 W	3 W
max. air flow	56 m ³ /h	56 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C
noise level	41 dB(A)	41 dB(A)
rated speed	6,800 min ⁻¹	6,850 min ⁻¹
weight	66 g	66 g
failure rate (L₁₀)	L ₁₀ > 60.000 h (40 °C)	L ₁₀ > 60.000 h (40 °C)

Other fan types and fan voltages on request.

M

N

D 15


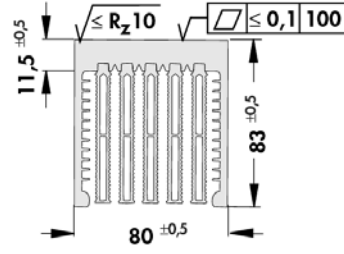
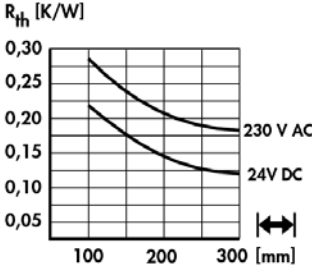

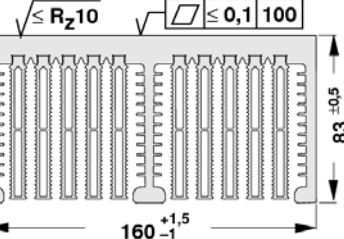
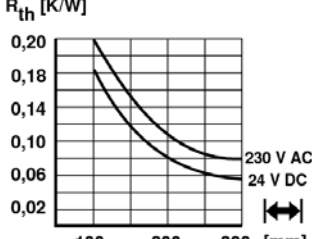

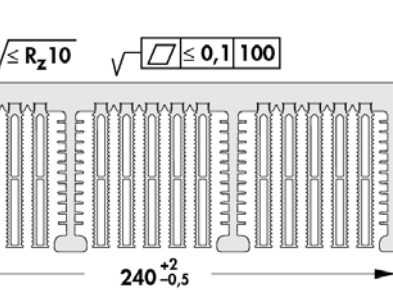
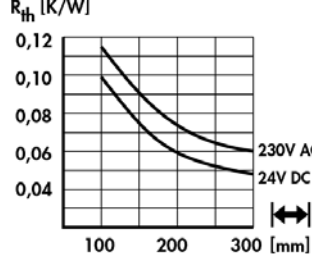

Protection grid for axial fans → D 32
 High capacity cooling aggregat. → D 24 - 27
 Cooling aggregates with radial fan → D 29 - 31
 Cooling aggreg. in segment mount. → D 5 - 7

Hole pattern → A 21
 Silicone wafers → E 2 - 4
 Thermal. conductive silicone foam foil → E 6
 Mounting pads → E 39

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- semiconductor mounting surface for milled flat

art. no. LA 9 ...			
art. no. LA 10 ...			
art. no. LA 11 ...			
please indicate: ... 		... fan type 24 = 24 V DC 230 = 230 V AC	

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	80 x 80 x 32 mm	80 x 80 x 38 mm
voltage	24 V DC	230 V AC
power input	6 W	12 W
max. air flow	80 m ³ /h	50 m ³ /h
temperature range	-20 °C ... +75 °C	-40 °C ... +90 °C
noise level	48 dB(A)	31 dB(A)
rated speed	5,000 min ⁻¹	2,800 min ⁻¹
weight	170 g	480 g
failure rate (L₁₀)	L ₁₀ > 55.000 h (40 °C)	L ₁₀ > 52.500 h (40 °C)

Other fan types and fan voltages on request.

Miniature cooling aggregates
Protection grid for axial fans
Heatsinks for Solid State Relay
High capacity heatsinks

→ D 9 - 11
→ D 32
→ A 12
→ A 57 - 58

Special heatsink design
Hole pattern
Standard aluminium profiles
Technical introduction

→ A 133 - 134
→ A 21
→ A 133 - 134
→ A 2 - 7

D 16

A

B

C

D

E

F

G

H

I

K

L

M

N

A

Cooling aggregates with axial fan


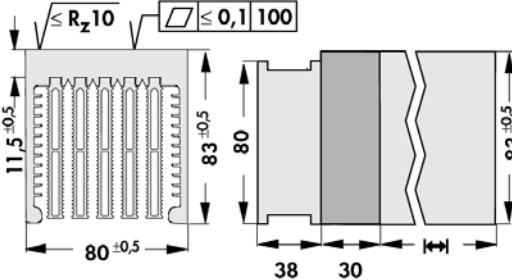
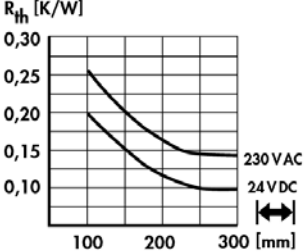

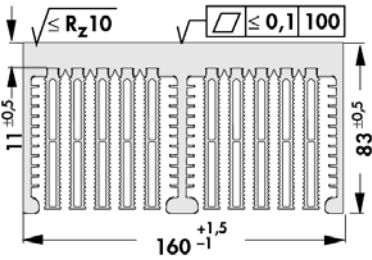
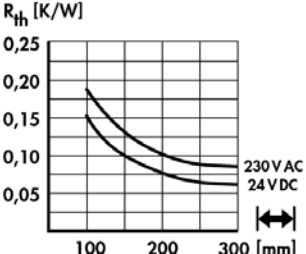

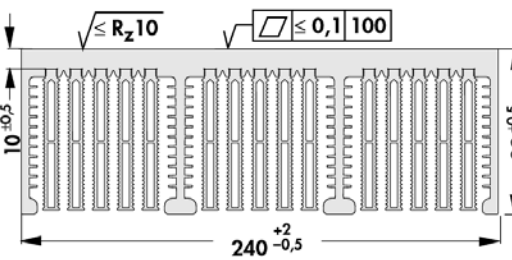
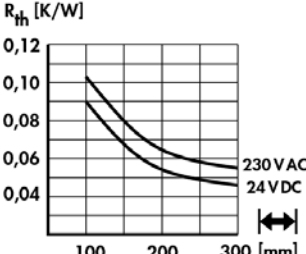

B

Hollow-fin cooling aggregates

- with air flow chamber
- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- semiconductor mounting surface for milled flat

C

D

art. no. LA V 9 ...			
art. no. LA V 10 ...			
art. no. LA V 11 ...			
please indicate: ... 		... fan type 24 = 24 V DC 230 = 230 V AC	

E

F

G

H

I

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	80 x 80 x 32 mm	80 x 80 x 38 mm
voltage	24 V DC	230 V AC
power input	6 W	12 W
max. air flow	80 m ³ /h	50 m ³ /h
temperature range	-20 °C ... +75 °C	-40 °C ... +90 °C
noise level	48 dB(A)	31 dB(A)
rated speed	5,000 min ⁻¹	2,800 min ⁻¹
weight	170 g	480 g
failure rate (L₁₀)	L ₁₀ > 55.000 h (40 °C)	L ₁₀ > 52.500 h (40 °C)

Other fan types and fan voltages on request.

M

N

D 17


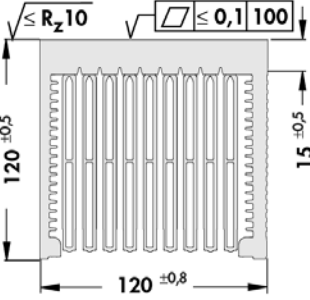
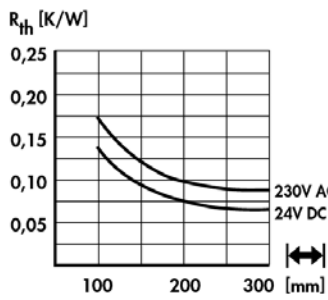

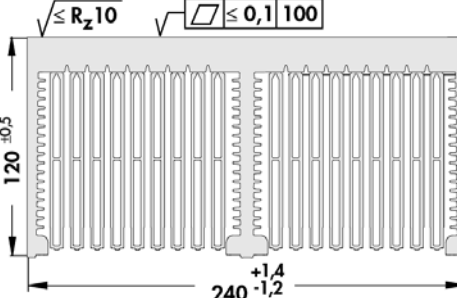
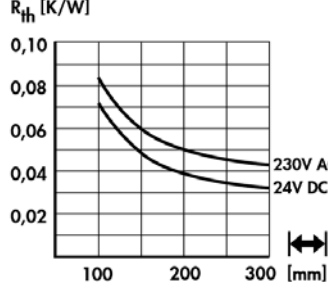

Protection grid for axial fans → D 32
 High capacity cooling aggregat. → D 24 – 27
 Cooling aggregates with radial fan → D 29 – 31
 Cooling aggreg. in segment mount. → D 5 – 7

Hole pattern → A 21
 Silicone wafers → E 2 – 4
 Thermal. conductive silicone foam foil → E 6
 Mounting pads → E 39

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- particularly effective heat dissipation
- compact design with axial fan
- semiconductor mounting surface for milled flat

art. no. LA 14 ...			
art. no. LA 15 ...			
please indicate: ...  100 150 200 250 300 400 mm		... fan type 24 = 24 V DC 230 = 230 V AC	

additional design to customer's instructions

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
voltage	24 V DC	230 V AC
power input	11 W	19 W
max. air flow	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
noise level	59 dB(A)	47 dB(A)
rated speed	4,400 min ⁻¹	2,650 min ⁻¹
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70.000 h (40 °C)	L ₁₀ > 37.500 h (40 °C)

Other fan types and fan voltages on request.

Miniature cooling aggregates
 Protection grid for axial fans
 Heatsinks for Solid State Relay
 High capacity heatsinks

→ D 9 - 11
 → D 32
 → A 12
 → A 57 - 58

Special heatsink design
 Hole pattern
 Standard aluminium profiles
 Technical introduction

→ A 133 - 134
 → A 21
 → A 133 - 134
 → A 2 - 7

A

Cooling aggregates with axial fan

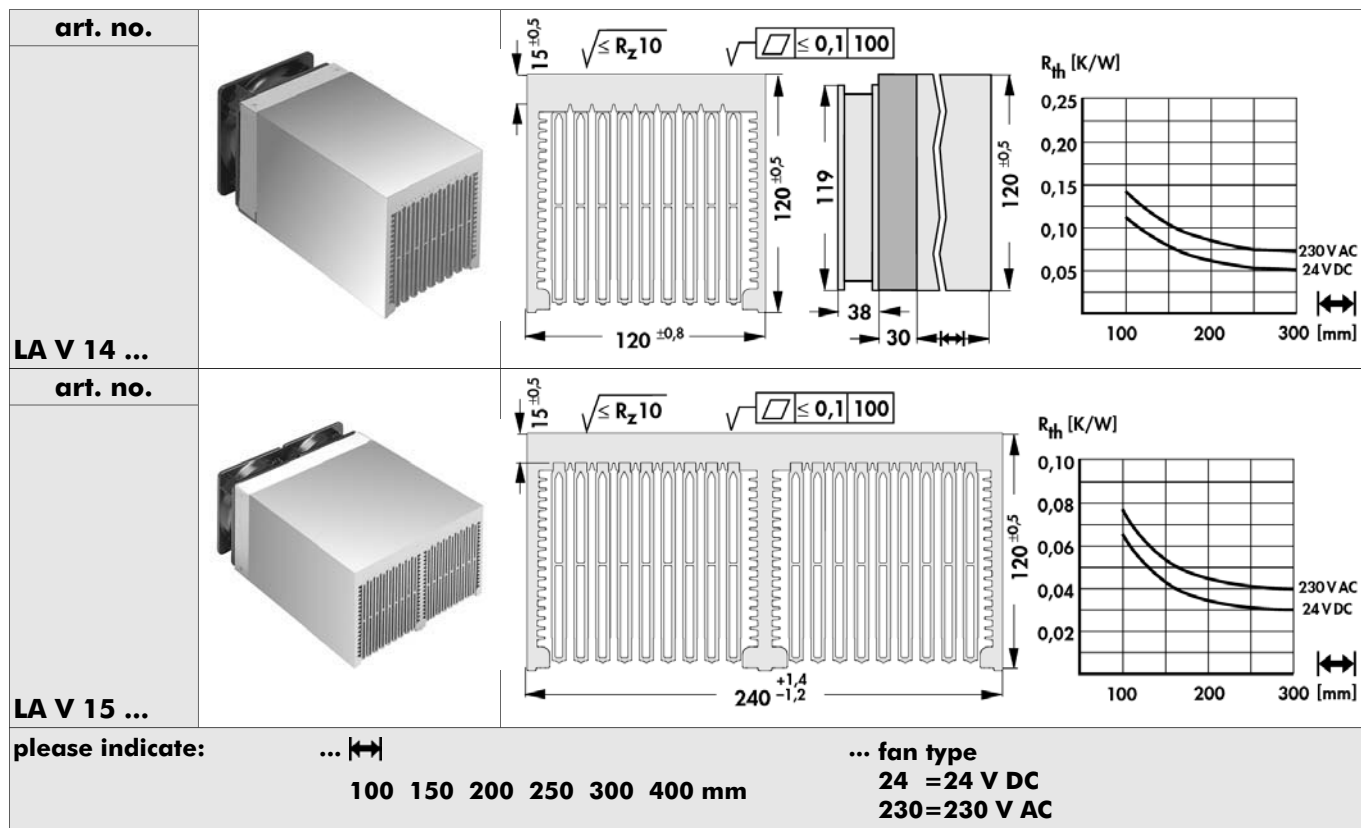
B

Hollow-fin cooling aggregates

- with air flow chamber
- extremely low losses due to optimised hollow fin geometry
- particularly effective heat dissipation
- compact design with axial fan
- semiconductor mounting surface for milled flat

C

D



additional design to customer's instructions on request

H

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
voltage	24 V DC	230 V AC
power input	11 W	19 W
max. air flow	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
noise level	59 dB(A)	47 dB(A)
rated speed	4,400 min ⁻¹	2,650 min ⁻¹
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70.000 h (40 °C)	L ₁₀ > 37.500 h (40 °C)

Other fan types and fan voltages on request.

L

M

N

D 19

Protection grid for axial fans → D 32
 High capacity cooling aggregat. → D 24 - 27
 Cooling aggregates with radial fan → D 29 - 31
 Cooling aggreg. in segment mount. → D 5 - 7

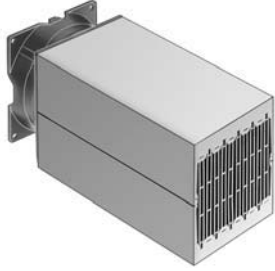
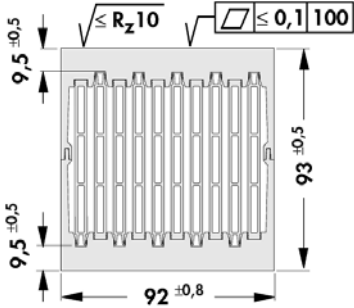
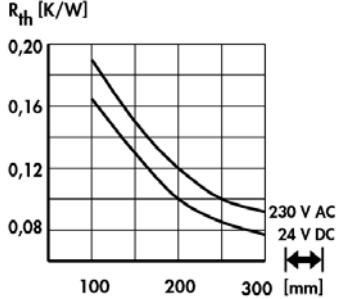

Hole pattern → A 21
 Silicone wafers → E 2 - 4
 Thermal. conductive silicone foam foil → E 6
 Mounting pads → E 39

Cooling aggregates with axial fan

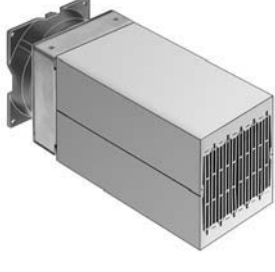
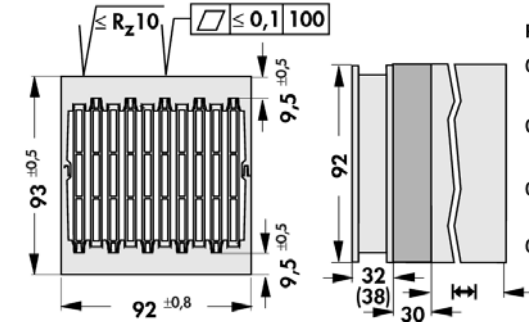
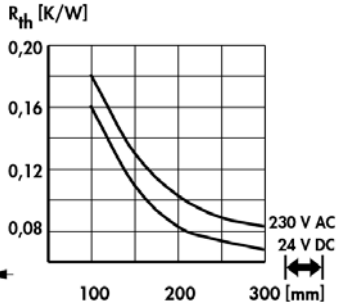

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat

without air flow chamber

art. no.			
LA 21 ...			
please indicate:	... 		... fan type
	100 150 200 250 300 400 mm		24 =24 V DC 230=230 V AC

Additional treatment upon customer's request.
with air flow chamber

art. no.			
LA V 21 ...			
please indicate:	... 		... fan type
	100 150 200 250 300 400 mm		24 =24 V DC 230=230 V AC

Additional treatment upon customer's request.

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	92 x 92 x 32 mm	92 x 92 x 38 mm
voltage	24 V DC	230 V AC
power input	5.3 W	12 W
max. air flow	107 m ³ /h	75 m ³ /h
temperature range	-20 °C ... +75 °C	-40 °C ... +75 °C
noise level	47 dB(A)	37 dB(A)
rated speed	4,000 min ⁻¹	2,700 min ⁻¹
weight	190 g	420 g
failure rate (L₁₀)	L ₁₀ > 57.500 h (40 °C)	L ₁₀ > 52.500 h (40 °C)

Other fan types and fan voltages on request.

Miniature cooling aggregates
Protection grid for axial fans
Heatsinks for Solid State Relay
High capacity heatsinks

→ D 9 - 11
→ D 32
→ A 12
→ A 57 - 58

Special heatsink design
Hole pattern
Standard aluminium profiles
Technical introduction

→ A 133 - 134
→ A 21
→ A 133 - 134
→ A 2 - 7

D 20

A

B

C

D

E

F

G

H

I

K

L

M

N

A

Cooling aggregates with axial fan

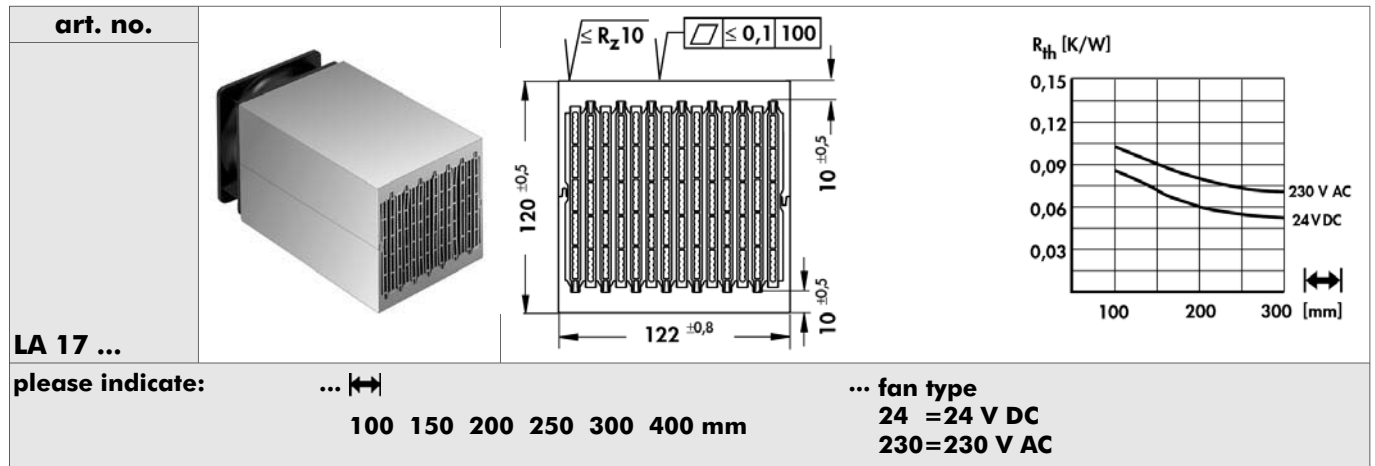
B

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat

C

without air flow chamber



D

E

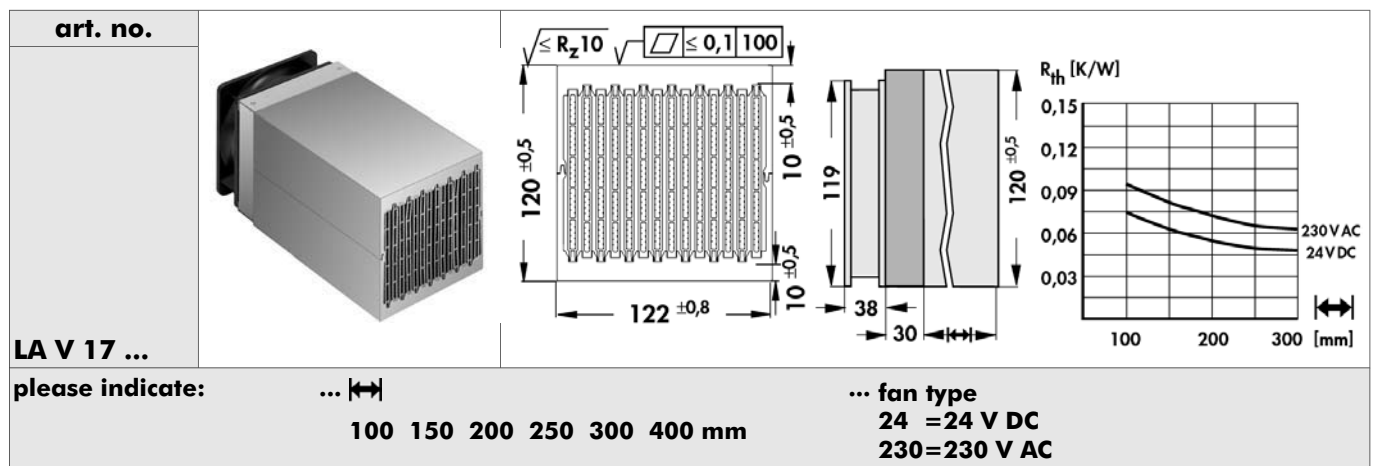
F

additional treatment upon customer's request

G

H

with air flow chamber



I

additional treatment upon customer's request

K

L

M

N

D 21

Protection grid for axial fans → D 32
 High capacity cooling aggregat. → D 24 - 27
 Cooling aggregates with radial fan → D 29 - 31
 Cooling aggreg. in segment mount. → D 5 - 7

Hole pattern → A 21
 Silicone wafers → E 2 - 4
 Thermal. conductive silicone foam foil → E 6
 Mounting pads → E 39

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
voltage	24 V DC	230 V AC
power input	11 W	19 W
max. air flow	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
noise level	59 dB(A)	47 dB(A)
rated speed	4,400 min ⁻¹	2,650 min ⁻¹
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70.000 h (40 °C)	L ₁₀ > 37.500 h (40 °C)

Other fan types and fan voltages on request.

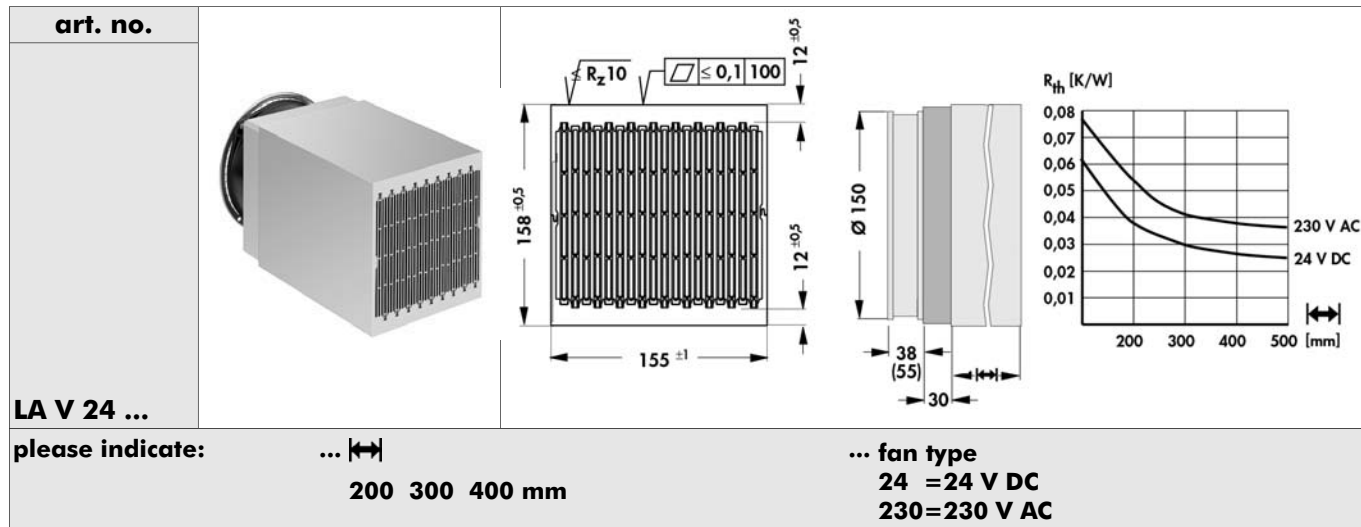
Protection grid for axial fans → D 32
High capacity cooling aggregat. → D 24 – 27
Cooling aggregates with radial fan → D 29 – 31
Cooling aggreg. in segment mount. → D 5 – 7

Hole pattern → A 21
Silicone wafers → E 2 – 4
Thermal. conductive silicone foam foil → E 6
Mounting pads → E 39

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- with air flow chamber
- extremely low losses due optimised hollow fin geometry
- especially effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat



additional treatment upon customer's request

Technical data of the fans

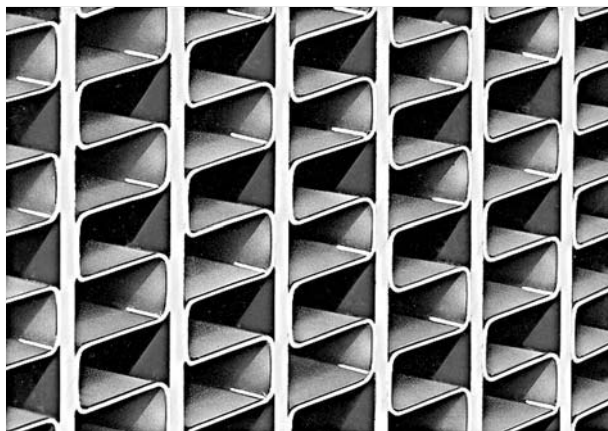
	... 24	... 230
type	ebmpapst, ball bearing, with grid	ebmpapst, ball bearing, with grid
dimensions	ø 150 x 38 mm	ø 150 x 55 mm
voltage	24 V DC	230 V AC
power input	19 W	47 W
max. air flow	420 m ³ /h	390 m ³ /h
temperature range	-25 °C ... +72 °C	-30 °C ... +60 °C
noise level	59 dB(A)	58 dB(A)
rated speed	3,350 min ⁻¹	2,700 min ⁻¹
weight	620 g	1,100 g
failure rate (L₁₀)	L ₁₀ > 75.000 h (40 °C)	L ₁₀ > 40.000 h (40 °C)

Other fan types and fan voltages on request.

Cooling aggregates with axial fan

High performance cooling aggregate

- extremely low losses of air flow as compared to cooling aggregates with extruded aluminium
- compact dimensions, that means high performance density due to large heat-conducting surfaces
- maximum heat flow due to brazing or thermal adhesion
- high performance cooling aggregates are only effective with forced ventilation by means of the fan, but not with free convection



material: solder-plated aluminium sheet, thus minimal weight due to the thickness of the material

An optimised unit for any application can be produced from the wide range of existing components upon request. The specific capacity will be determined by a test run upon customer's request.

Technical data of the fan

	... 230
type	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm
voltage	230 V AC
power input	19 W
max. air flow	160 m ³ /h
temperature range	-40 °C ... +85 °C
noise level	47 dB(A)
rated speed	2,650 min ⁻¹
weight	550 g
failure rate (L₁₀)	L ₁₀ > 37.500 h (40 °C)

Other fan types and fan voltages on request.

A

Cooling aggregates with axial fan

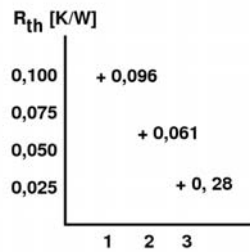
B

High performance cooling aggregate

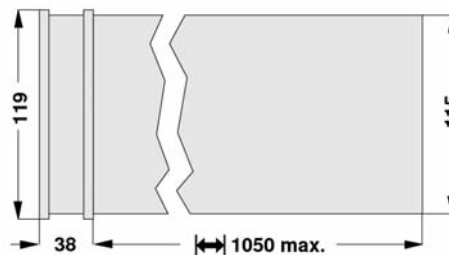
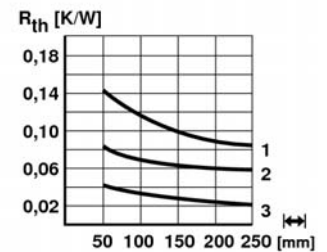
without air flow chamber

C

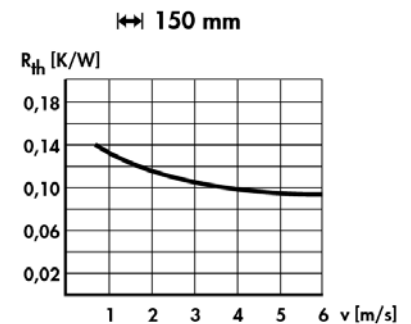
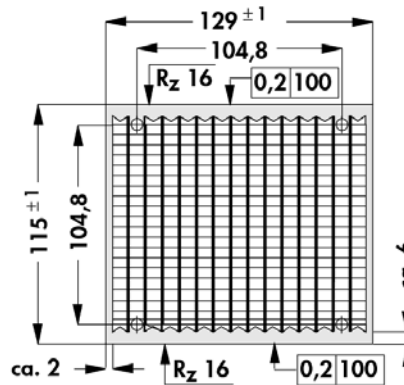
D

 \leftrightarrow 150 mm $v = 6$ m/s


LA HL 1 ... 3

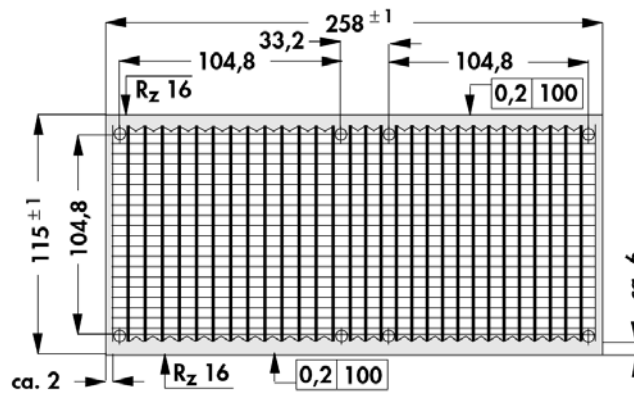

 $v = 6$ m/s


art. no.



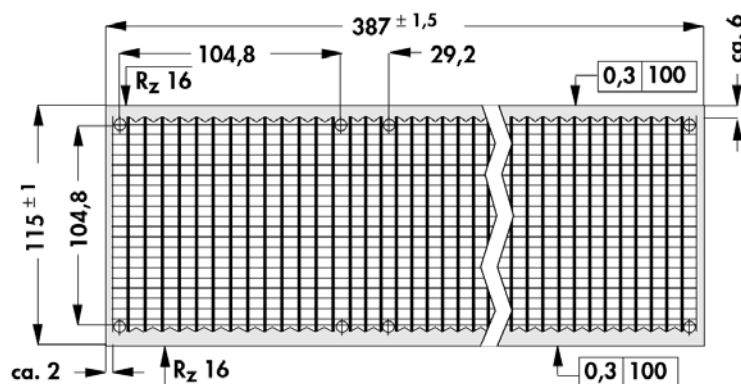
LA HL 1 ...

art. no.



LA HL 2 ...

art. no.



LA HL 3 ...

please indicate:

... \leftrightarrow

100 150 200 250 300 400 mm

M

N

D 25

Special heatsink design
Lamella heatsinks
Heatsinks for Solid State Relay
Technical introduction

→ A 133 - 134
→ A 127
→ A 11 - 12
→ A 2 - 7

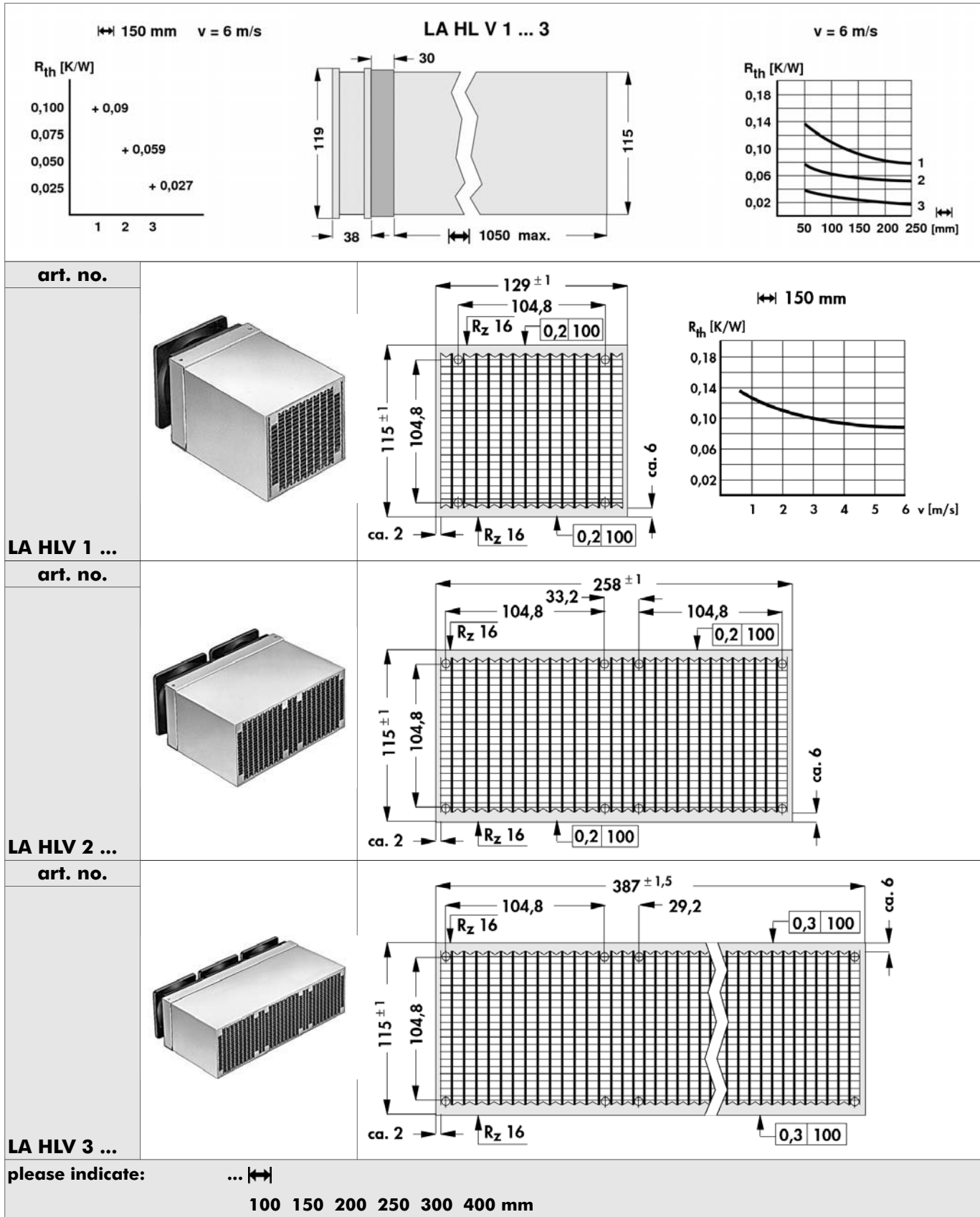
Cooling aggregates with radial fan
Order example
Miniature cooling aggregates
Protection grid for axial fans

→ D 29 - 31
→ A 21
→ D 9 - 11
→ D 32

Cooling aggregates with axial fan

High performance cooling aggregate

with air flow chamber



Special heatsink design
 Lamella heatsinks
 Heatsinks for Solid State Relay
 Technical introduction

→ A 133 - 134
 → A 127
 → A 11 - 12
 → A 2 - 7

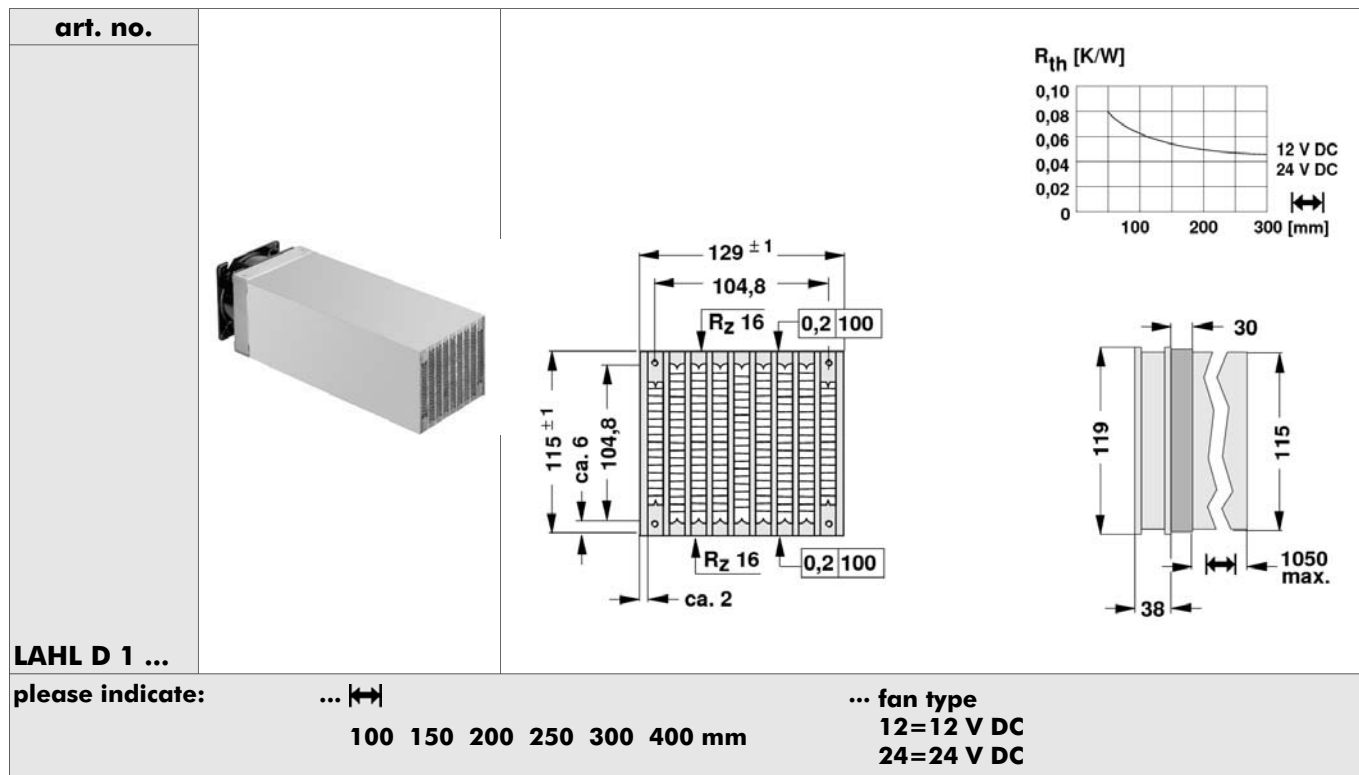
Cooling aggregates with radial fan
 Order example
 Miniature cooling aggregates
 Protection grid for axial fans

→ D 29 - 31
 → A 21
 → D 9 - 11
 → D 32

A

Cooling aggregate with diagonal fan

- high performance cooling aggregate
- innovative, efficient heatsink design
- thick web plates for maximum heat dissipation
- specially formed laminated structures ensure optimum heat exchange with the air flow
- newly developed powerful mixed flow fan for highly efficient heat dissipation
- reduced noise output achieved by an optimised adaption of fan motor and heatsink



additional treatment and modifications upon customer's request
 other versions (double, triple) will follow

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing, with grid	ebmpapst, ball bearing, with grid
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
voltage	12 V DC	24 V DC
power input	21 W	21 W
max. air flow	275 m ³ /h	275 m ³ /h
temperature range	-20 °C ... +65 °C	-20 °C ... +65 °C
noise level	60 dB(A)	60 dB(A)
rated speed	6,000 min ⁻¹	6,000 min ⁻¹
weight	455 g	455 g
failure rate (L₁₀)	L ₁₀ > 70.000 h (20 °C) L ₁₀ > 40.000 h (60 °C)	L ₁₀ > 70.000 h (20 °C) L ₁₀ > 40.000 h (60 °C)

Other fan types and fan voltages on request.

L

M

N

D 27

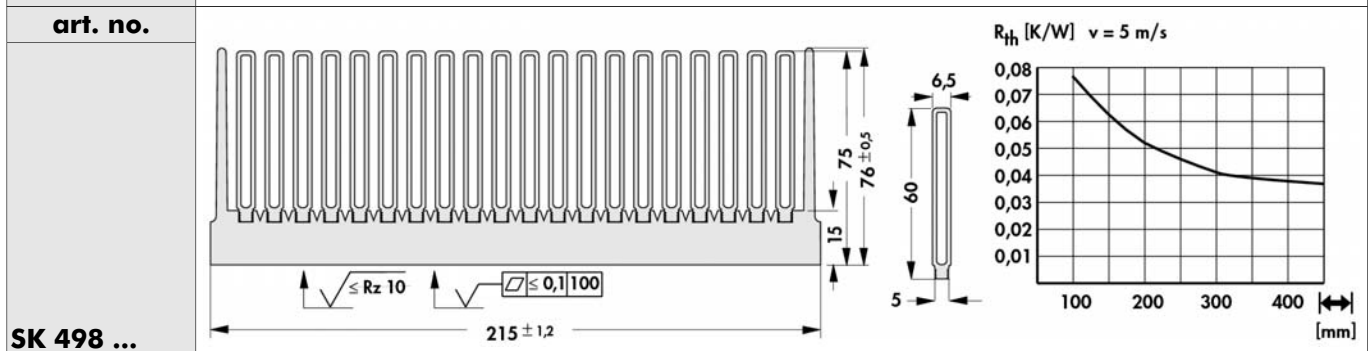
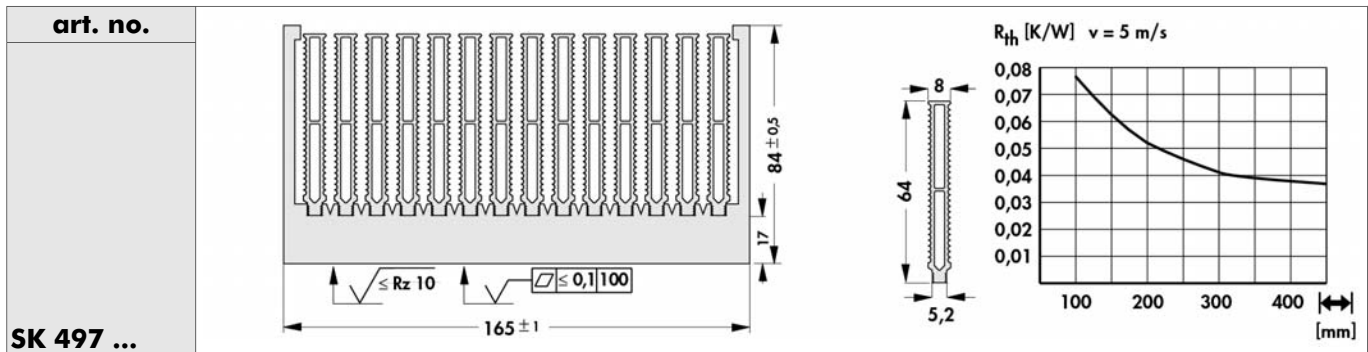
Cooling aggregates with radial fan → D 29 – 31
 Heatsinks with hollow fin profile → D 28
 Hollow-fin cooling aggregates → D 14 – 23
 Extruded heatsink-cooling aggregat. → D 13

Protection grid for axial fans → D 32
 Cooling aggreg. in segment mount. → D 5 – 7
 Miniature cooling aggregates → D 9 – 11
 Thermal conductive material → E 2 – 15

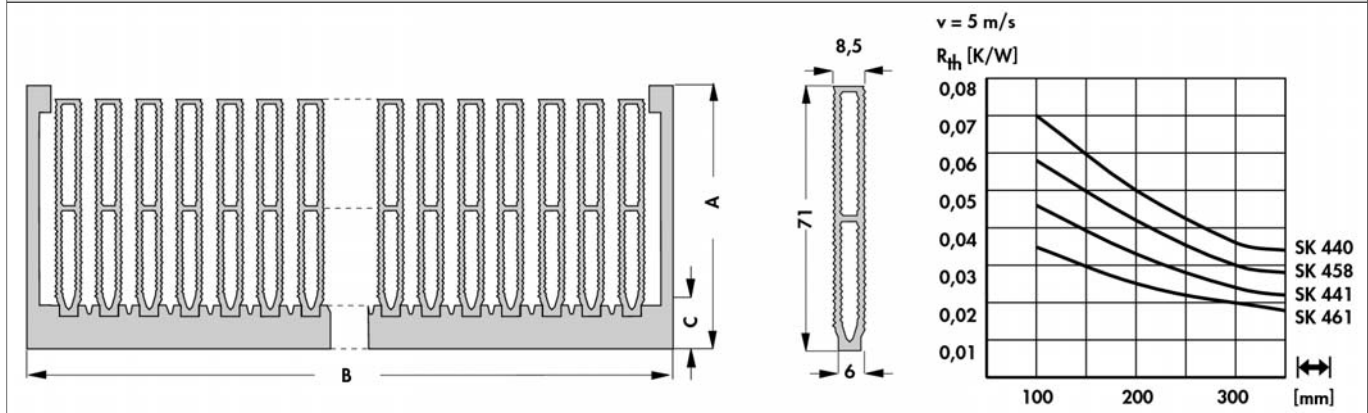
High-performance heatsinks

High performance heatsinks with hollow-fin profile

- high performance heatsinks for fan operation
- exclusively for forced convection
- preferably for radial or tangential fans
- hollow fin geometry optimises the air flow
- particularly effective heat dissipation
- flat milled base (except length 1000 mm)



please indicate: ... \longleftrightarrow
150 200 250 300 1000 mm



art. no.	number of fins	dim. [mm]		
		A	B	C
SK 440 ...	15	84 ±1	200 ±1.2	16
SK 458 ...	19	84 ±1	250 ±1.4	16
SK 441 ...	23	84 ±1	300 ±1.6	16
SK 461 ...	31	88 ±1	400 ±2.0	20

please indicate: ... \longleftrightarrow
150 200 300 1000 mm

High capacity cooling aggregat. → D 24 - 27
 Cooling aggregates with radial fan → D 29 - 31
 Heatsinks with hollow fin profile → D 28
 Hollow-fin cooling aggregates → D 14 - 23

Extruded heatsink-cooling aggregat. → D 13
 Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Order example → D 7

D 28

A
B
C
D
E
F
G
H
I
K
L
M
N

A

Cooling aggregates with radial fan

B

- high performance cooling aggregate
- optimised air flow due to hollow fin geometrie
- very good thermic performance
- optimized high performance construction with radial fan
- mounting surface for semiconductor milled flat

C

D


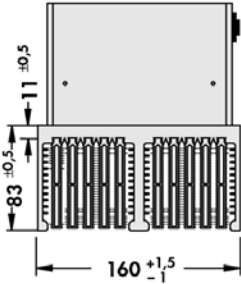
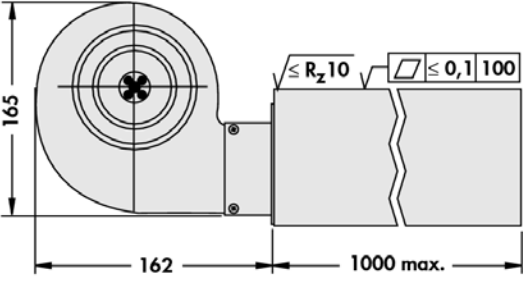
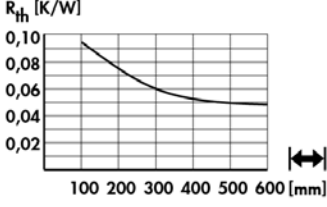

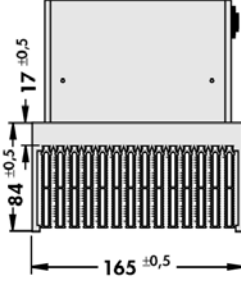
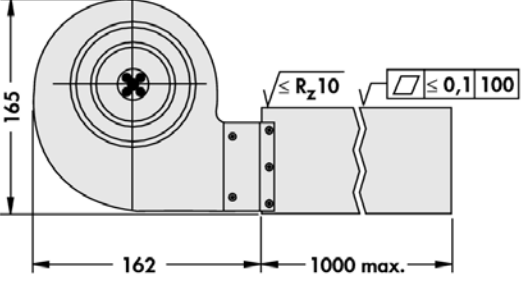
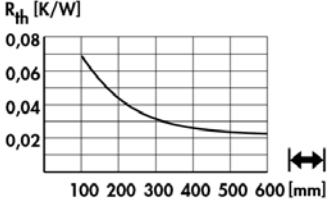

E

F

G

H

I

art. no. LA 25 ...			 
art. no. LA 26 ...			 
please indicate: ...  200 300 400 500 600 mm			

cover plate for fin side upon request
 additional customized treatment upon request
 motor condenser: **art. no. LAHLR K 2**

K

Technical data of the fan

type	ebmpapst, radial blower with grid, double sided absorption
bearing type	ball bearing
discharge air flow	435 m ³ /h
rotation speed	1,950 min ⁻¹
power input	87 W
current consumption	0.39 A
temperature range	-25 °C ... +40 °C
circuit voltage	230 V AC
motor condenser	2 400V
acoustic level	58 db(A)
weight	1,500 g

N

D 29

Heatsinks for Solid State Relay
 Die-cast heatsinks
 High capacity heatsinks
 Special heatsink design


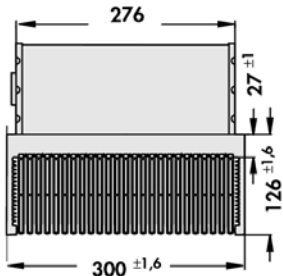
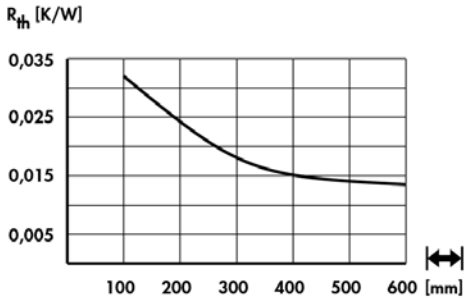
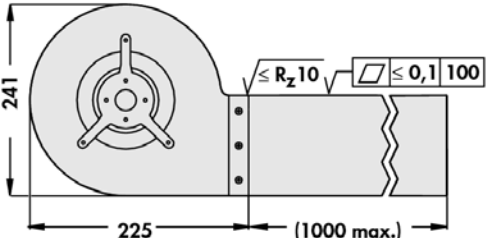

→ A 12
 → A 123
 → A 57 - 58
 → A 133 - 134

Technical introduction
 Lamella heatsinks
 Hole pattern

→ A 2 - 7
 → A 127
 → A 21

Cooling aggregates with radial fan

- high performance cooling aggregate
- optimised air flow due to hollow fin geometrie
- very good thermic performance
- optimized high performance construction with radial fan
- mounting surface for semiconductor milled flat

art. no.			
			
LA 20 ...			
please indicate:	... 		
	200 300 400 500 600 mm		

additional customized treatment upon request
 cooling aggregate also available without radial fan
 cover plate for fan side upon request
 motor condenser: **art. no. LA 20 K 6**

Technical data of the fan

type	ebmpapst, radial blower with grid, double sided absorbtion
bearing type	ball bearing
discharge air flow	1,310 m ³ /h
rotation speed	1,350 min ⁻¹
power input	185 W
current consumption	0.81 A
temperature range	-25 °C ... +70 °C
circuit voltage	230 V AC
motor condenser	6 µF
acoustic level	64 db(A)
weight	5,900 g

High capacity cooling aggregat. → D 24 – 27
 Heatsinks with hollow fin profile → D 28
 Hollow-fin cooling aggregates → D 14 – 23
 Extruded heatsink-cooling aggregat. → D 13

Cooling aggreg. in segment mount. → D 5 – 7
 Miniature cooling aggregates → D 9 – 11
 Thermal conductive material → E 2 – 15
 Technical introduction → A 2 – 7

D 30

A

B

C

D

E

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A

Cooling aggregates with radial fan

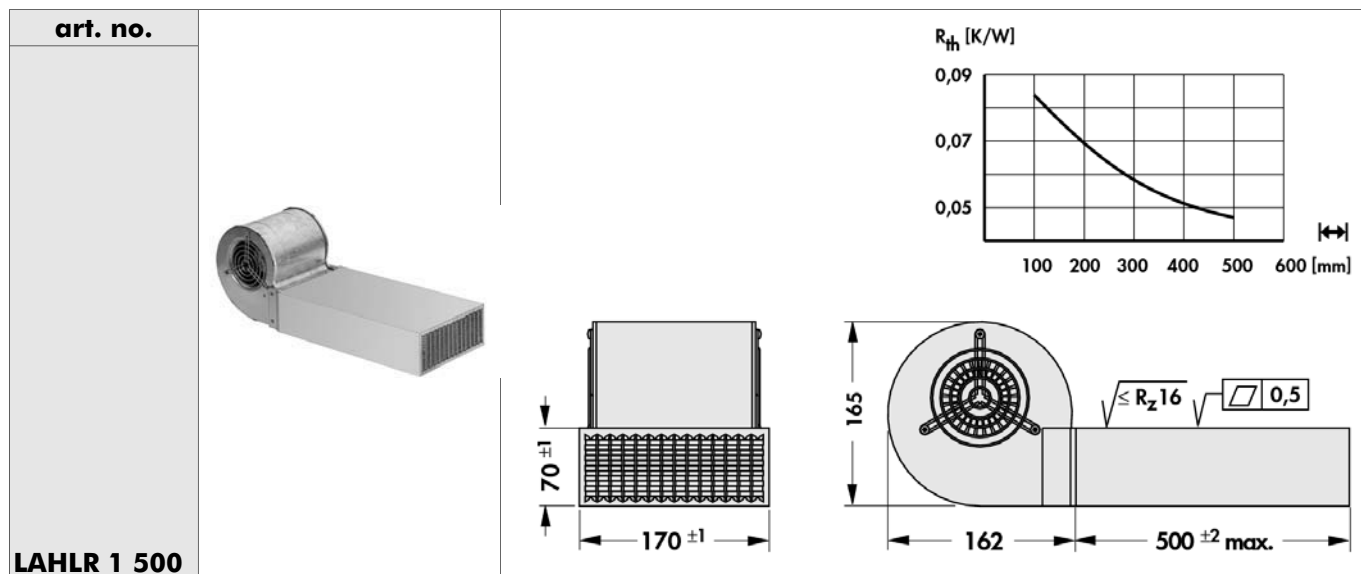
high performance cooling aggregate

B

C

D

E



other lengths upon request

 motor condenser: **art. no. LAHLR K 2**

F

Technical data of the cooling element

construction	solid frame construction with inner animation and carrier plates, thermally connected by soldering
weight	6,300 g
material	aluminium alloy
surface treatment	blanc, milled flat

G

Technical data of the fan

type	ebmpapst, radial blower with grid, double sided absorption
bearing type	ball bearing
discharge air flow	435 m ³ /h
rotation speed	1,950 min ⁻¹
power input	87 W
current consumption	0.39 A
temperature range	-25 °C ... +40 °C
circuit voltage	230 V AC
motor condenser	2_400V
acoustic level	58 db(A)
weight	1,500 g

H

I

K

L

M

N

D 31

 Heatsinks for Solid State Relay
 Die-cast heatsinks
 High capacity heatsinks
 Technical introduction

 → A 12
 → A 123
 → A 57 - 58
 → A 2 - 7

 Special heatsink design
 Lamella heatsinks
 Hole pattern

 → A 133 - 134
 → A 127
 → A 21

Protection grid for fans

protection against contact as per EN 294; **aerodynamic construction**; minimized noise modification; **only low modification of the air flow**

art. no.	suitable for cooling aggregate
LAGI 40	LAM 2/ LAM 4
art. no.	suitable for cooling aggregate
LAGI 60	LAM 1/ LA (V) 6 / LA (V) 7 / LA (V) 8
art. no.	suitable for cooling aggregate
LAGI 80	LA (V) 9 / LA (V) 10 / LA (V) 11
art. no.	suitable for cooling aggregate
LAGI 92	LA 2/ LA (V) 21
art. no.	suitable for cooling aggregate
LAGI 119	LA 4/ LA 5/ LA (V) 14 / LA (V) 15 / LA (V) 17 / LA HL D1/ LA HL (V) 1 / LA HL (V) 2 / LA HL (V) 3

material: steel wire

surface: nickel

High capacity cooling aggregat. → D 24 – 27
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Extruded heatsink-cooling aggregat. → D 13
 Cooling aggreg. in segment mount. → D 5 – 7
 Miniature cooling aggregates → D 9 – 11
 Order example → D 7

D 32

A

B

C

D

E

F

G

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