



to cool to protect to connect



f.news.e 2019

Heatsinks Thermally conductive material Cases Connectors



ISO 9001
ISO 14001
ISO 27001

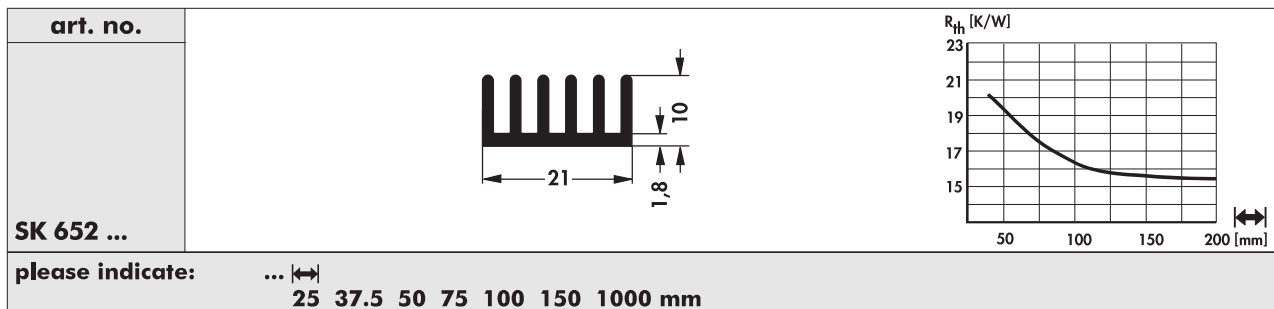
A



Standard extruded heatsinks

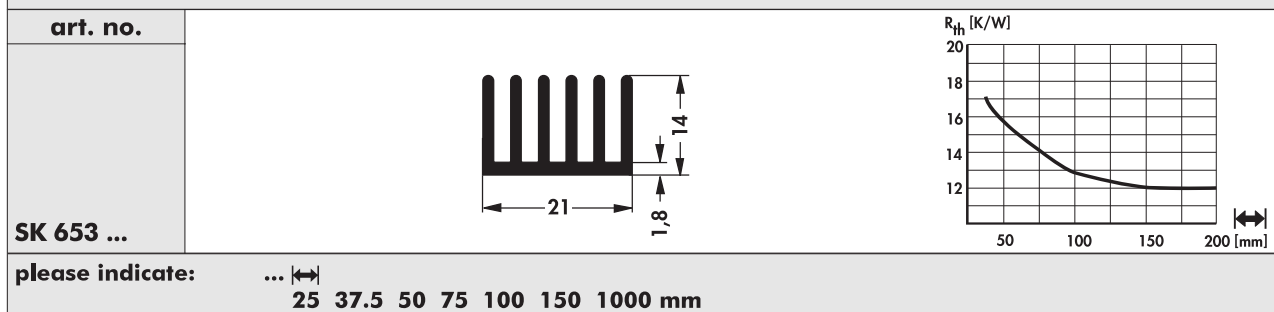
B

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D

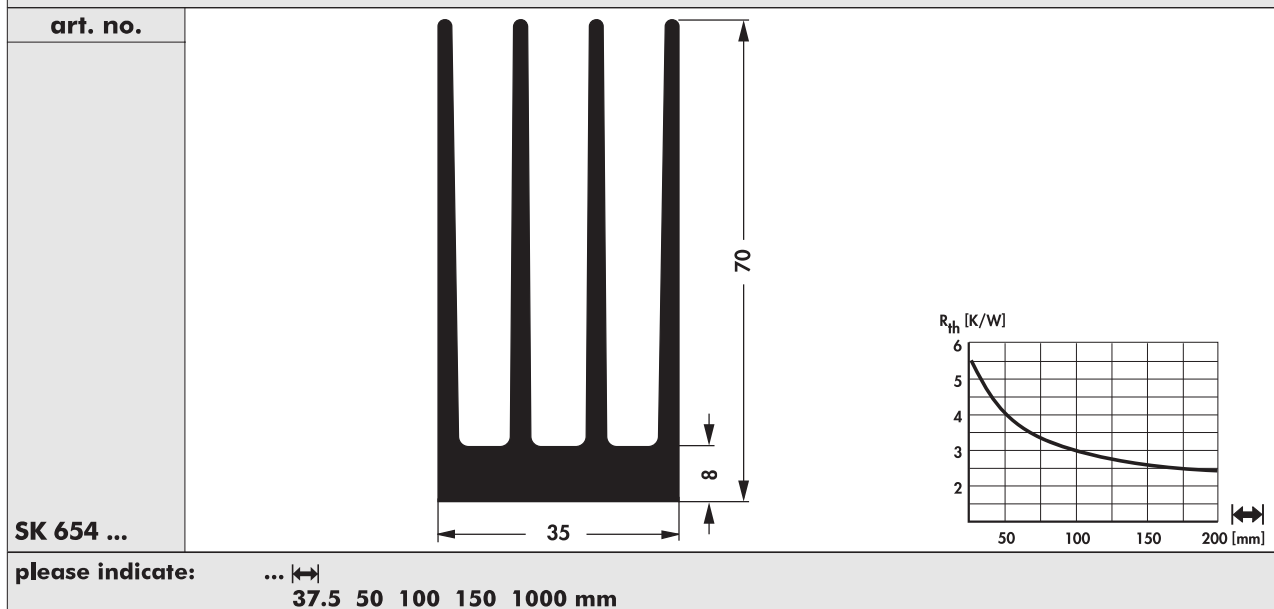
E



F

G

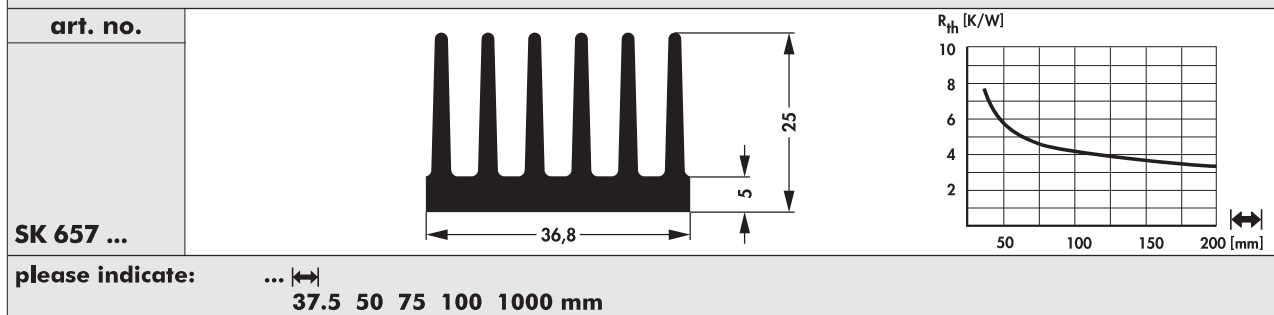
H



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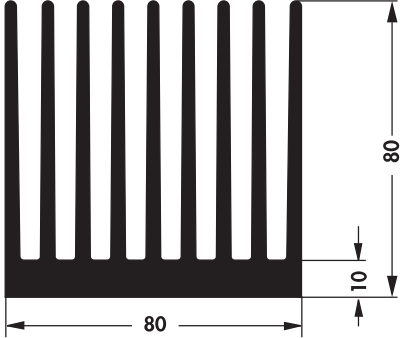
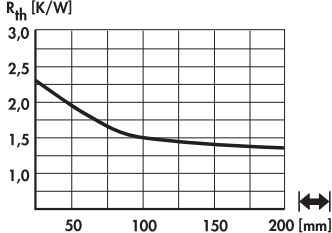
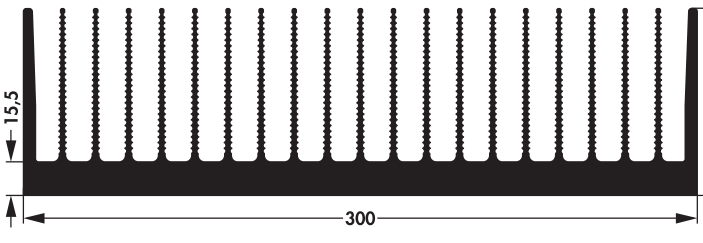
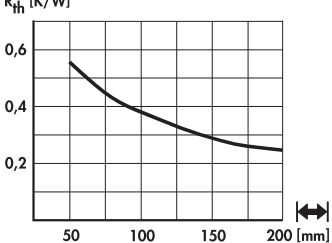
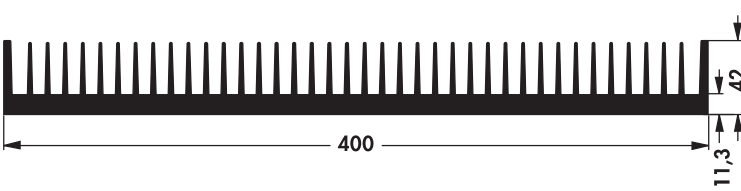
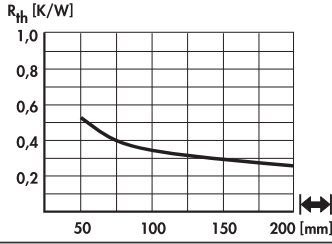
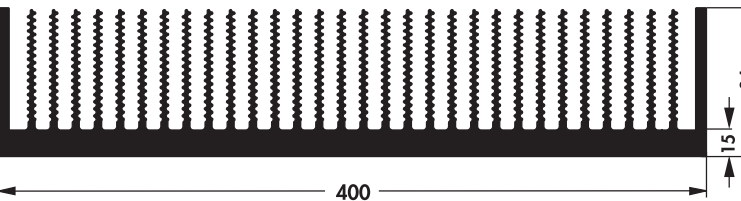
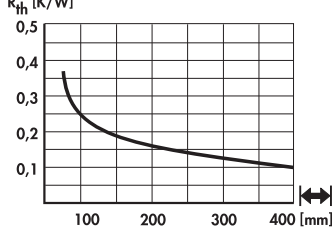
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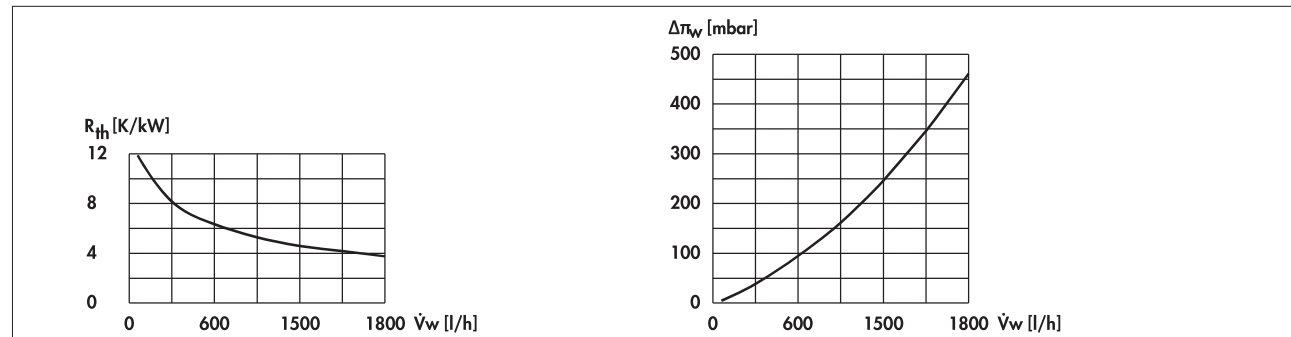


M

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Standard extruded heatsinks
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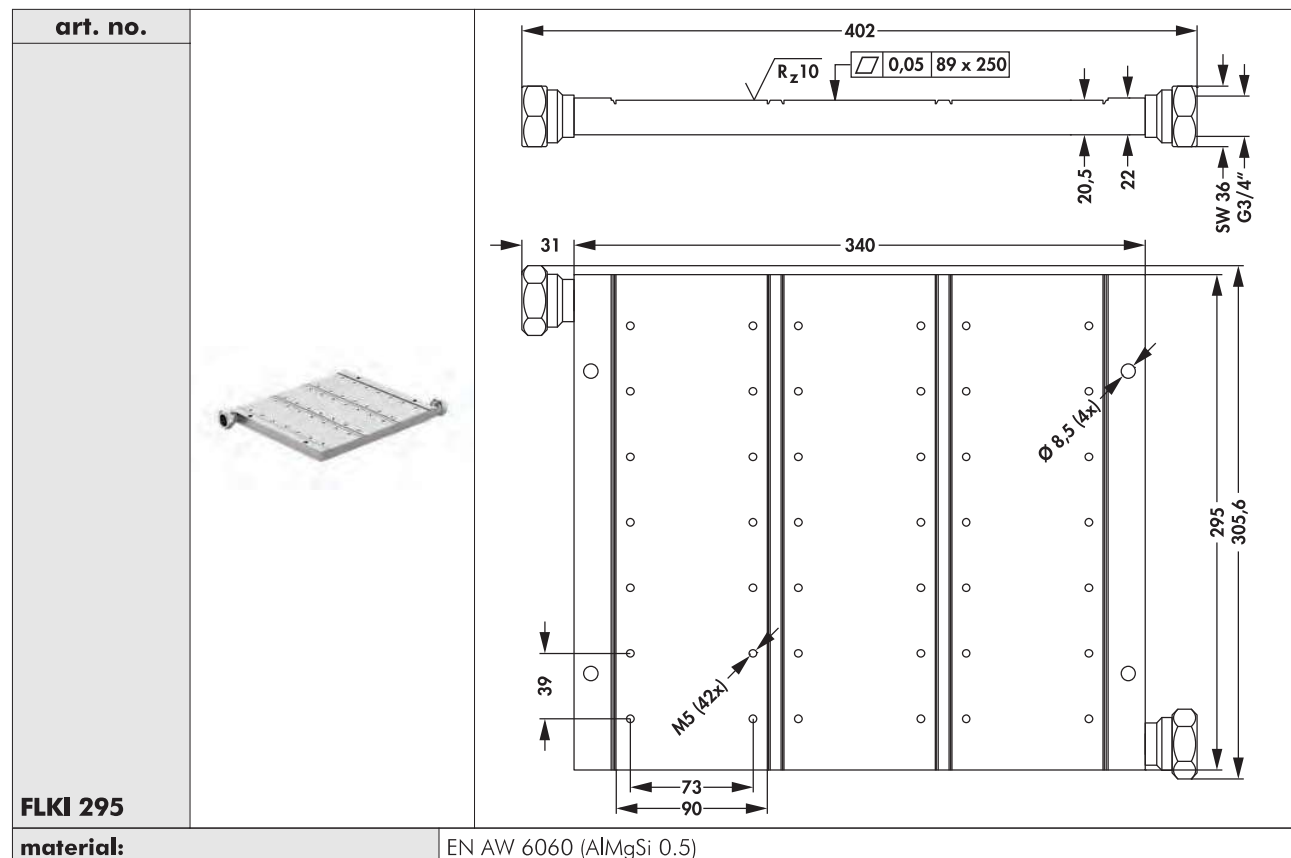
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art. no. SK 656 ...	  please indicate: ... 100 150 200 1000 mm
art. no. SK 651 ...	  please indicate: ... 75 100 150 200 1000 mm
art. no. SK 650 ...	  please indicate: ... 150 200 300 400 1000 mm



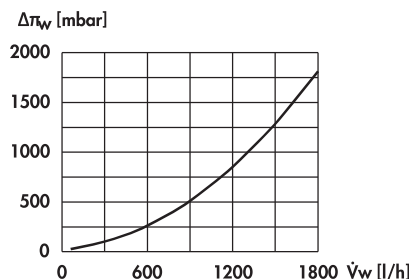
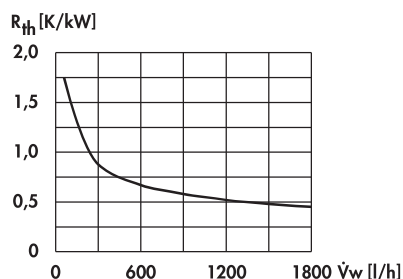
– Water glycol mixture (60/40); inlet temperature approx. 26°C

Fluid coolers of special design for high-power converters PrimePack™3+ module (IGBT 5); **for heat dissipation of maximum 3 modules on one liquid cooler**; suitable for water pH 6,5-8,5 with corrosion protection as well as other fluids (i.e. oils, alcohols, etc.); **particularly good heat transfer to the fluid by means of inner lamellae structure**; operating excess pressure up to 2 bars possible; **thick mounting plate for optimal heat distribution**; mounting of the modules will be done by already installed M5 threads; **threw holes for mounting of the fluid coolers**; precisely milled flat semiconductor mounting surface with very good flatness and low roughness depth; **line connection for water inlet and outlet by means of a G 3/4" thread**; special designs and modifications for a specific assembly situation according to customerspecific specifications.

To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60 % (preferred is 50 %) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.



Fluid coolers for power modules

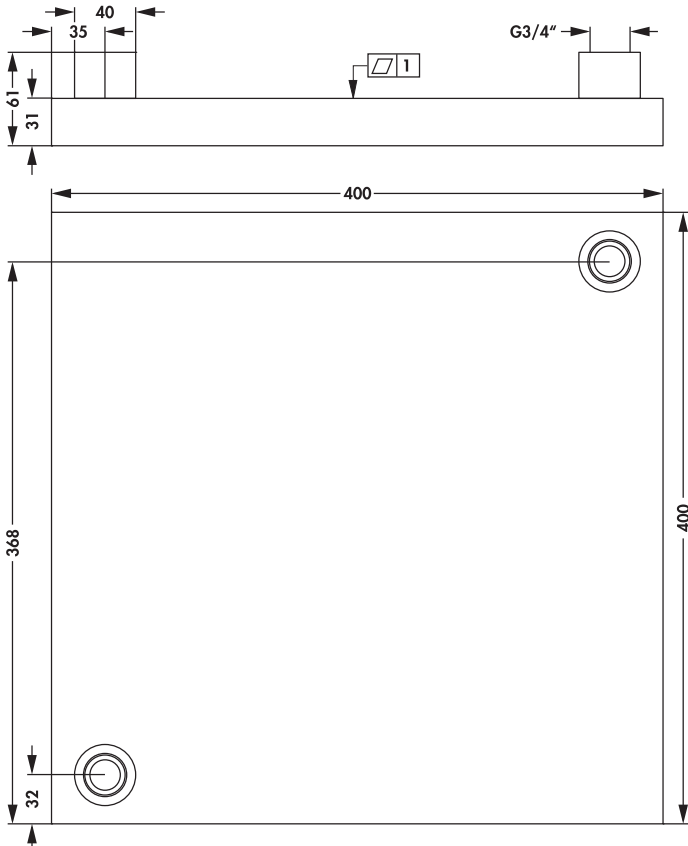
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– Water glycol mixture (60/40); inlet temperature approx. 26°C

Fluid cooler for dissipating large quantities of heat with low space requirement; **effective system to cool power modules**; suitable for water pH 6,5-8,5 with anticorrosives, as well as other fluids (eg. oils, alcohols, etc.); **compact design with internal fin structure for particularly good heat transfer to the fluid**; minimised flow pressure losses; **operating excess pressure up to 2 bar possible**; thick base plate for optimum heat distribution and to secure the heat-emitting elements; **mounting flange for the cooler according to customer's instructions**; precisely face milled surface of the component mounting area with very good flatness and low roughness depth; **for power modules such as IGBT-modules, thyristor-modules, SCR diode modules, bridge amplifier and others**; **dimensional modification at specified installation conditions**; connections via thread G3/4" or mounting flange according to customer's specifications; **drilling depth into the base panel maximum 17 mm**.

To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60 % (preferred is 50 %) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

– Dimensioning and realisation in connection with customer's specifications

art. no.				
FLKI 400 G 400				
material:	EN AW 6060 (AlMgSi 0.5)			

A

Pin heatsinks

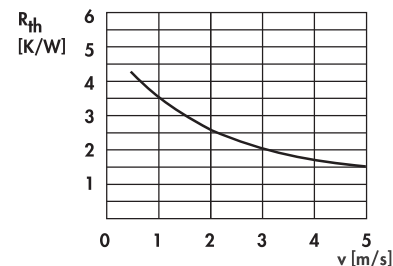
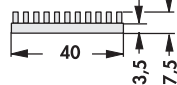
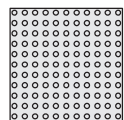
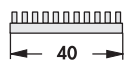
B

C

ICK S 40 x 40 x 7,5

WLF ... 40 x 40

weight: 18g



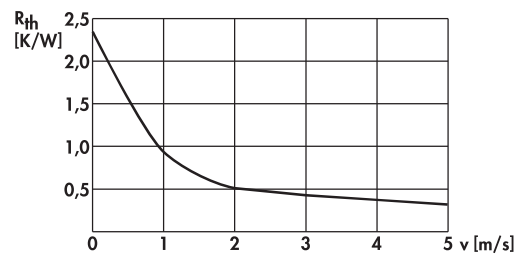
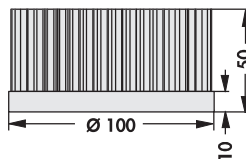
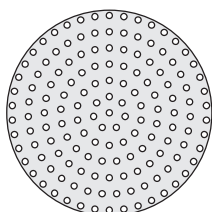
D

E

ICK S R 100 x 50

WLF ... D 100

weight: 320g



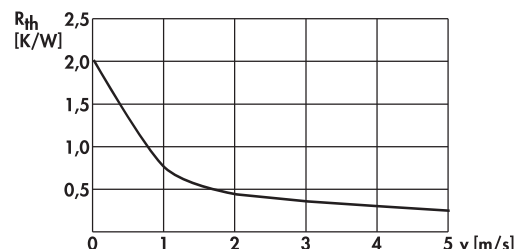
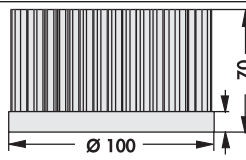
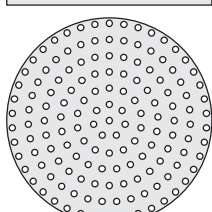
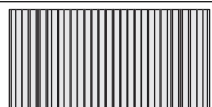
F

G

ICK S R 100 x 70

WLF ... D 100

weight: 381.5g



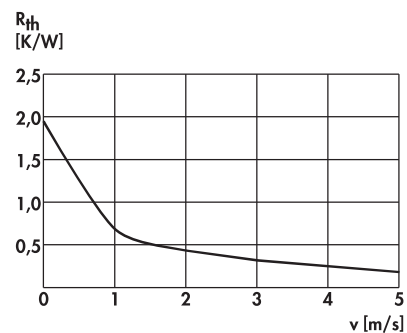
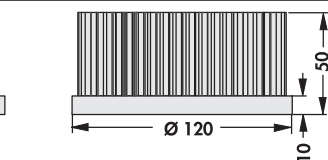
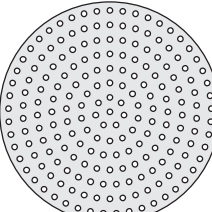
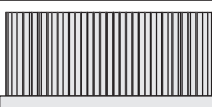
H

I

ICK S R 120 x 50

WLF ... D 120

weight: 455.8g



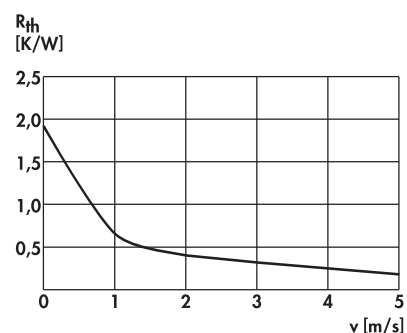
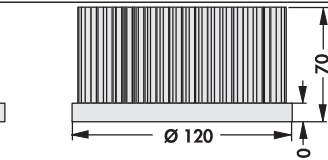
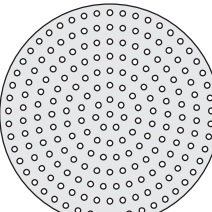
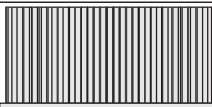
K

L

ICK S R 120 x 70

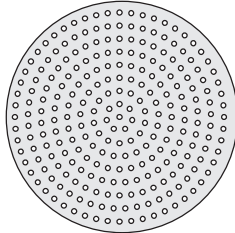
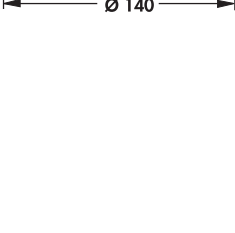
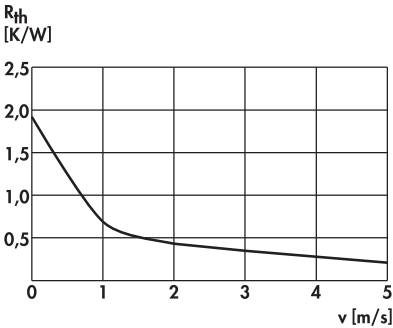
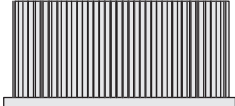
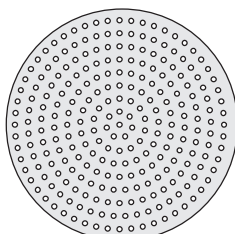
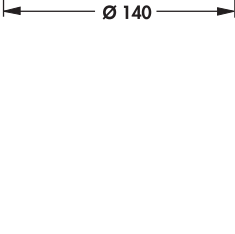
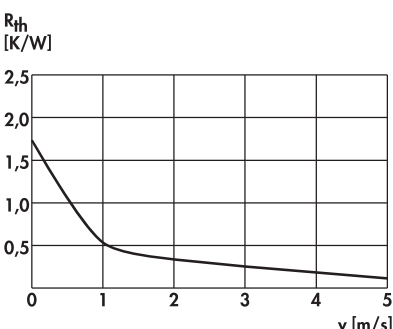
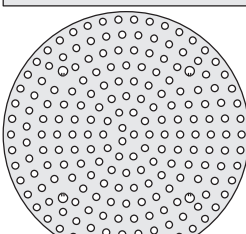
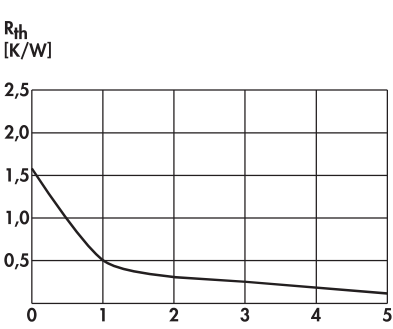
WLF ... D 120

weight: 530.9g



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art. no.	 	 	
ICK S R 140 x 50 WLF ... D 140 weight: 608.8g			
art. no.	 	 	
ICK S R 140 x 70 WLF ... D 140 weight: 705.3g			
art. no.	 		
ICK S R 160 x 70 WLF ... D 160 weight: 1,055g			

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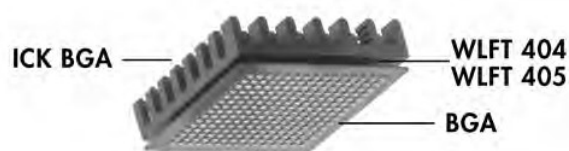
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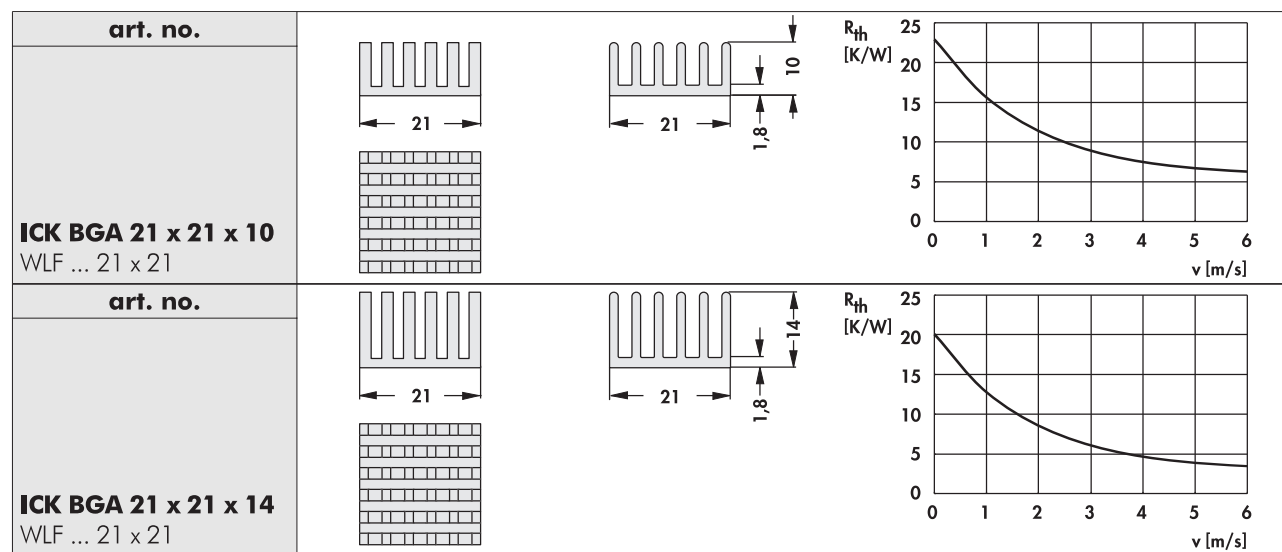
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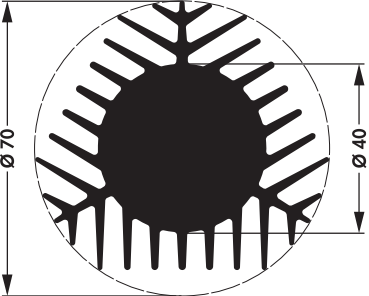
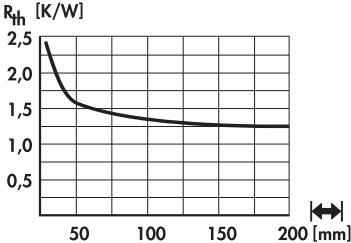
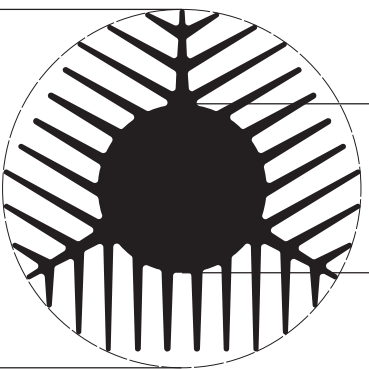
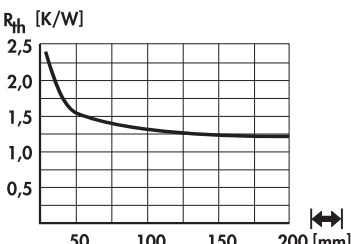
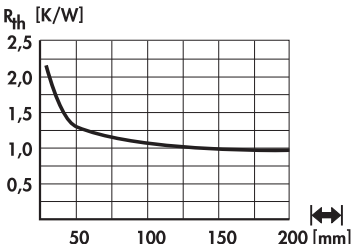
N

Heatsinks for BGAs



- particularly suited for **B**all **G**rid **A**rrays
- heatsink dimensions match the respective BGA-type
- can be glued directly on the BGA component
- double-sided adhesive thermal conductive foil **WLF ...**
- **surface:** black anodised

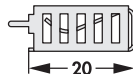
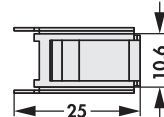
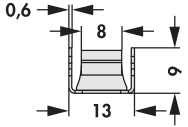
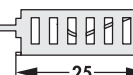
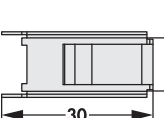
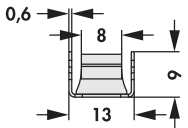
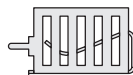
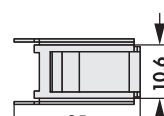
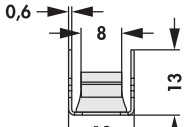
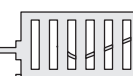
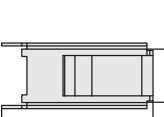
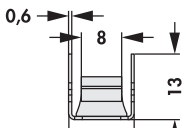
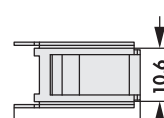
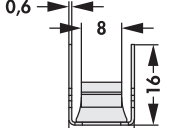
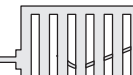
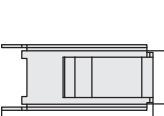
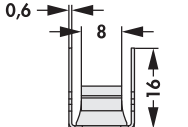


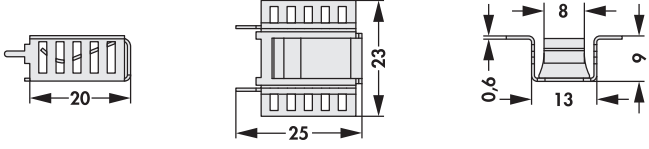
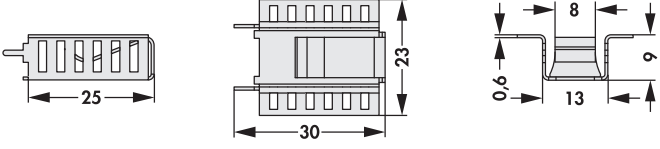
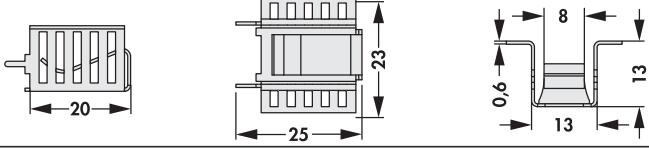
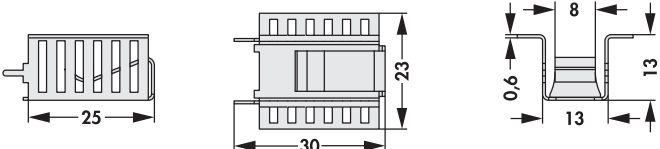
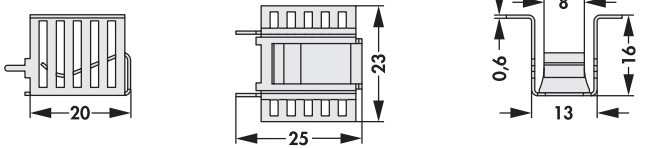
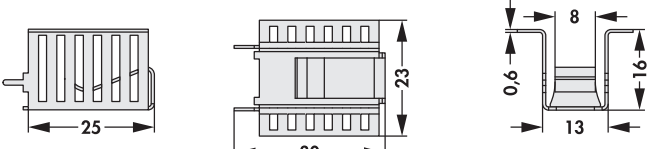
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art. no. SK 659 ...		
please indicate: ...  10 15 20 25 37.5 50 1000 mm		
surface: black anodised		
art. no. SK 660 ...		
please indicate: ...  10 15 20 25 37.5 50 75 100 150 1000 mm		
surface: black anodised		

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Attachable heatsink

- universal clip-on heatsinks for design TO 220 and similar
- integrated clamp geometry for a secure fixing of the device
- angled designs with enlarged surface
- modifications and special designs according to customer's specifications

art. no.			23,9 K/W		lieferbar ab 04/2019 available from • disponible à partir du • k dodání od	
FK 259						
art. no.			23,6 K/W		lieferbar ab 04/2019 available from • disponible à partir du • k dodání od	
FK 260						
art. no.			23,3 K/W		lieferbar ab 04/2019 available from • disponible à partir du • k dodání od	
FK 261						
art. no.			23 K/W		lieferbar ab 05/2019 available from • disponible à partir du • k dodání od	
FK 262						
art. no.			22,7 K/W		lieferbar ab 05/2019 available from • disponible à partir du • k dodání od	
FK 263						
art. no.			22,4 K/W		lieferbar ab 05/2019 available from • disponible à partir du • k dodání od	
FK 264						
material:		copper (Cu)				
surface:		solderable surface				
material thickness:		0.6 mm				

art. no. FK 265		22 K/W lieferbar ab 06/2019 available from • disponible à partir du • k dodání od 
art. no. FK 266		21,7 K/W lieferbar ab 06/2019 available from • disponible à partir du • k dodání od 
art. no. FK 267		21,4 K/W lieferbar ab 06/2019 available from • disponible à partir du • k dodání od 
art. no. FK 268		21,1 K/W lieferbar ab 07/2019 available from • disponible à partir du • k dodání od 
art. no. FK 269		20,7 K/W lieferbar ab 07/2019 available from • disponible à partir du • k dodání od 
art. no. FK 270		20,4 K/W lieferbar ab 07/2019 available from • disponible à partir du • k dodání od 
material:	copper (Cu)	
surface:	solderable surface	
material thickness:	0.6 mm	

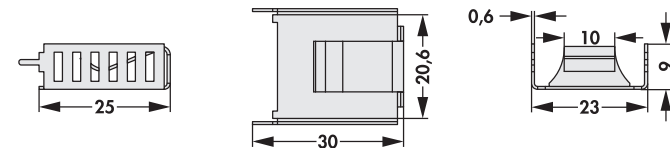
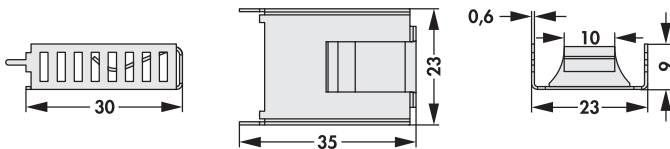
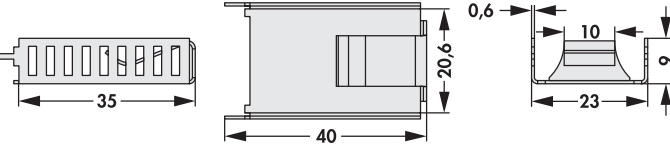
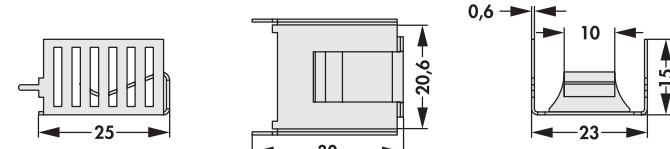
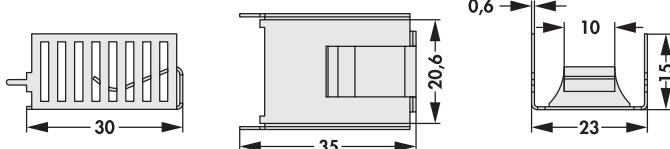
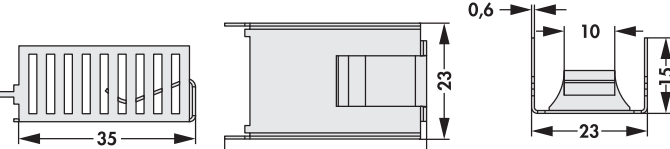
A

Attachable heatsink

B

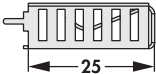
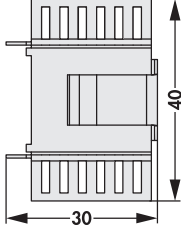
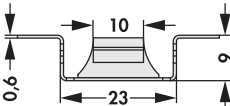
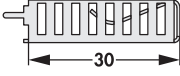
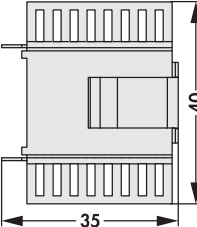
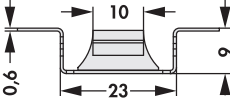
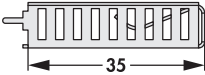
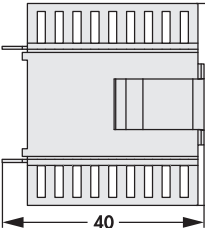
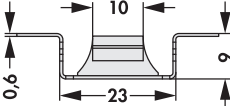
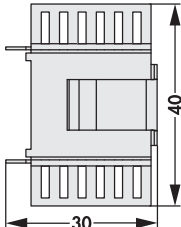
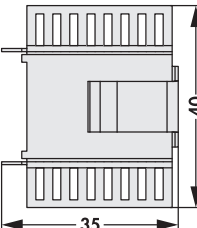
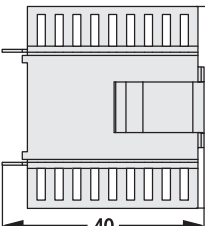
- universal clip-on heatsinks for design TO 218, TO 247, TO 248 and similar
- integrated clamp geometry for a secure fixing of the device
- angled designs with enlarged surface
- modifications and special designs according to customer's specifications

C

art. no. FK 271		19,4 K/W lieferbar ab 08/2019 available from • disponible à partir du • k dodání od 
art. no. FK 272		19,1 K/W lieferbar ab 08/2019 available from • disponible à partir du • k dodání od 
art. no. FK 273		18,8 K/W lieferbar ab 08/2019 available from • disponible à partir du • k dodání od 
art. no. FK 274		18,7 K/W lieferbar ab 09/2019 available from • disponible à partir du • k dodání od 
art. no. FK 275		18,4 K/W lieferbar ab 09/2019 available from • disponible à partir du • k dodání od 
art. no. FK 276		18,1 K/W lieferbar ab 09/2019 available from • disponible à partir du • k dodání od 
material: surface: material thickness:		copper (Cu) solderable surface 0.6 mm

M

N

art. no.		18,4 K/W				lieferbar ab 10/2019  available from disponible à partir du k dodání od
FK 277						
art. no.		18,1 K/W				lieferbar ab 10/2019  available from disponible à partir du k dodání od
FK 278						
art. no.		17,8 K/W				lieferbar ab 10/2019  available from disponible à partir du k dodání od
FK 279						
art. no.		17,7 K/W				lieferbar ab 11/2019 available from  disponible à partir du k dodání od
FK 280						
art. no.		17,4 K/W				lieferbar ab 11/2019 available from  disponible à partir du k dodání od
FK 281						
art. no.		17,1 K/W				lieferbar ab 11/2019 available from  disponible à partir du k dodání od
FK 282						
material:		copper (Cu)				
surface:		solderable surface				
material thickness:		0.6 mm				

A

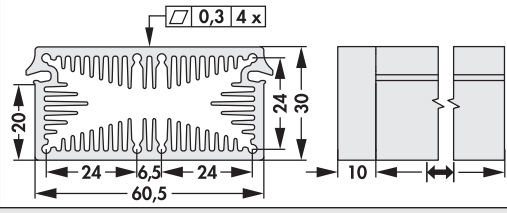
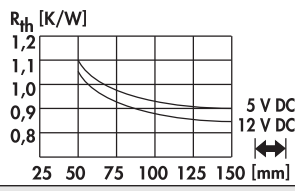
Miniature cooling aggregates

B

- compact design
- homogeneous heat distribution
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and machinings according to customer's specifications
- other surfaces, fan types and fan voltages upon request

C

D

art. no.			
LAM 3 D K ...			
please indicate:	...  50 75 100 125 150 mm		
	... fan type 5 = 5 V DC 12 = 12 V DC		
surface:	natural colour anodised		

E

Technical data of the fans

	... 5	... 12
type	Sepa, ball bearing	Sepa, ball bearing
dimensions	30x30x10 mm	30x30x10 mm
tension	5 V DC	12 V DC
max. air volume	6.8 m ³ /h	7.7 m ³ /h
cur. consumpt.	130 mA	60 mA
temperature range	-10°C... +70°C	-10°C ... +85°C
noise level	21 dB(A)	27 dB(A)
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 > 100,000 h (20°C) MTBF > 400,000 h (20°C)

H

I

K

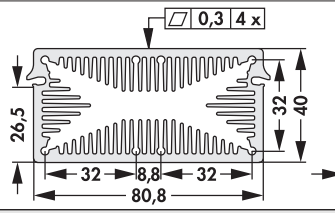
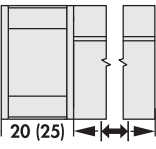
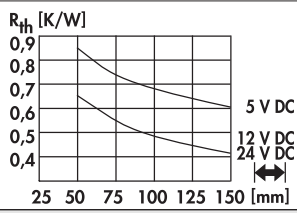
L

M

N

Miniature cooling aggregates

- compact design
- homogeneous heat distribution
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and machinings according to customer's specifications
- other surfaces, fan types and fan voltages upon request

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

Technical data of the fans

	... 5	... 12	... 24
type	ebmpapst 405	ebmpapst 412 JHH	ebmpapst 414 JHH
dimensions	40x40x20 mm	40x40x25 mm	40x40x25 mm
tension	5 V DC	12 V DC	24 V DC
power inout	0.9 W	3.3 W	3.6 W
max. air volume	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)
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 (t _{max})	L ₁₀ < 57,500 h (40°C) L ₁₀ < 35,000 h (t _{max})	L ₁₀ < 57,500 h (40°C) L ₁₀ < 35,000 h (t _{max})

A

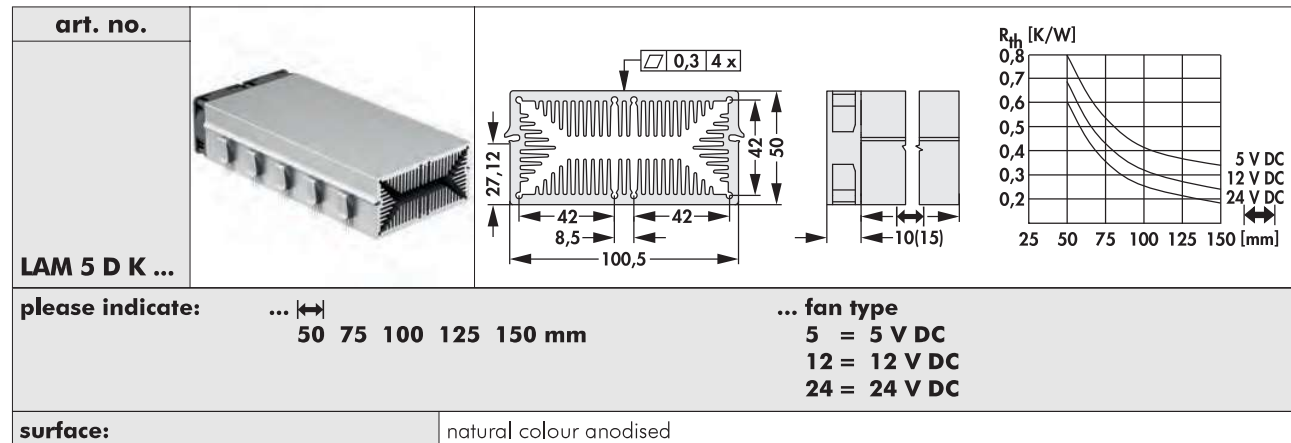
Miniature cooling aggregates

B

- compact design
- homogeneous heat distribution
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and machinings according to customer's specifications
- other surfaces, fan types and fan voltages upon request

C

D



E

Technical data of the fans

	... 5	... 12	... 24
type	Sepa, ball bearing	Sepa, ball bearing	ebmpapst
dimensions	50x50x10 mm	50x50x10 mm	50x50x15 mm
tension	5 V DC	12 V DC	24 V DC
max. air volume	10 m ³ /h	14.3 m ³ /h	20 m ³ /h
temperature range	-10°C... +70°C	-10°C... +70°C	-20°C... +70°C
speed	3,400 min ⁻¹	4,800 min ⁻¹	5,000 min ⁻¹
noise level	17 dB(A)	22 dB(A)	30 dB(A)
weight	19 g	19 g	27 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	with	with	

F

G

H

I

K

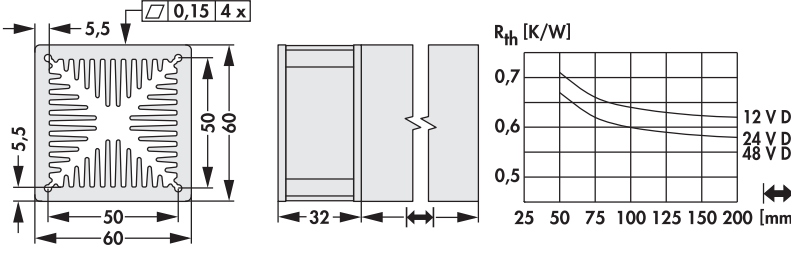
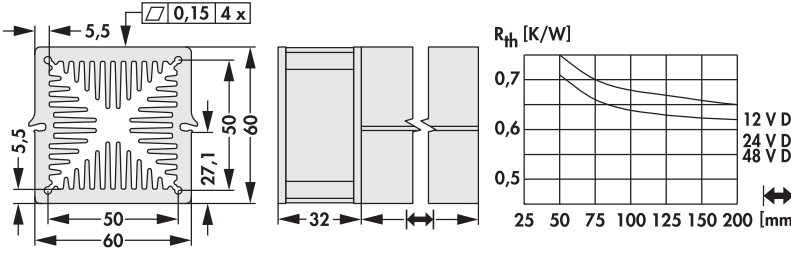
L

M

N

Miniature cooling aggregates

- compact design
- homogeneous heat distribution
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and machinings according to customer's specifications
- other surfaces, fan types and fan voltages upon request

art. no. LAM 6 ...		
art. no. LAM 6 K ...		
LAM 6 K ... with grooves for lock-in retaining spring for transistors THFU please indicate: ... 50 75 100 125 150 mm ... fan type 5 = 5 V DC 12 = 12 V DC 24 = 24 V DC		
surface:	natural colour anodised	

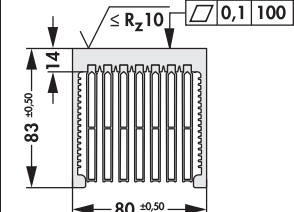
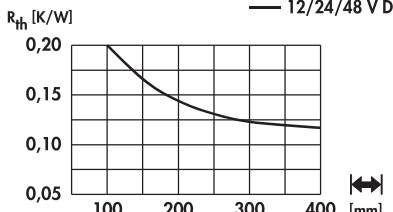
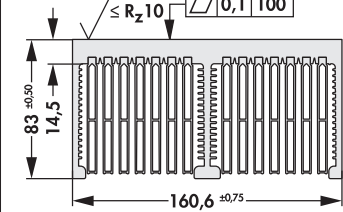
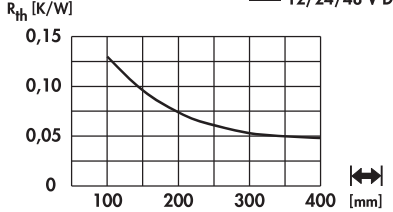
Technical data of the fans

	... 12	... 24	... 48
type	ebmpapst 612 JH	ebmpapst 614 J/2HHP	ebmpapst 618 J/2HHP
dimensions	60x60x32 mm	60x60x32 mm	60x60x32 mm
tension	12 V DC	24 V DC	48 V DC
power inout	7.7 W	14.6 W	14.6 W
max. air volume	70 m³/h	82 m³/h	82 m³/h
temperature range	-20°C... +70°C	-20°C... 75°C	-20°C... 75°C
noise level	53 dB(A)	62 dB(A)	62 dB(A)
speed	11,700 min⁻¹	15,000 min⁻¹	15,000 min⁻¹
weight	100 g	100 g	100 g
failure rate (L₁₀)	L₁₀ < 57,500 h (40°C)	L₁₀ > 65,000 h (40°C)	L₁₀ > 65,000 h (40°C)

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- hollow-fin geometry of new conception
- enlarged surface due to larger fin quantity
- effective heat dissipation with low pressure drop
- available with and without air-flow chamber
- milled flat semiconductor mounting surface
- mechanical treatments according to customer's specifications

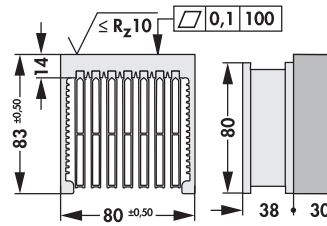
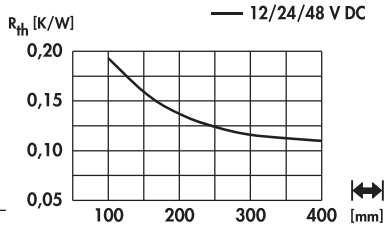
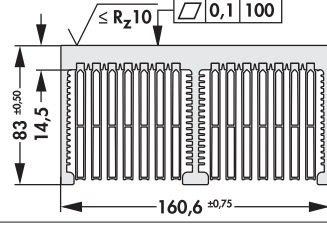
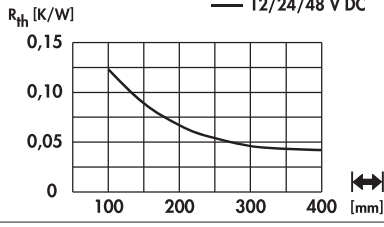
art. no.				
LA 34 ...		without air flow chamber		
art. no.				
LA 35 ...		without air flow chamber		
please indicate:		...  100 150 200 250 300 mm		
		... fan type 12 = 12 V DC 24 = 24 V DC 48 = 48 V DC		

Technical data of the fans

	... 12	... 24	... 48
type	ebmpapst 8212 JH4	ebmpapst 8214 JH4	ebmpapst 8218 JH4
dimensions	80x80x38 mm	80x80x38 mm	80x80x38 mm
tension	12 V DC	24 V DC	48 V DC
power inout	39 W	38 W	36 W
max. air volume	222 m ³ /h	222 m ³ /h	222 m ³ /h
temperature range	-20°C... +70°C	-20°C... +70°C	-20°C... +70°C
noise level	71 dB(A)	71 dB(A)	71 dB(A)
speed	14,000 min ⁻¹	14,000 min ⁻¹	14,000 min ⁻¹
weight	200 g	200 g	200 g
failure rate (L₁₀)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)

Hollow-fin cooling aggregates

- hollow-fin geometry of new conception
- enlarged surface due to larger fin quantity
- effective heat dissipation with low pressure drop
- available with and without air-flow chamber
- milled flat semiconductor mounting surface
- mechanical treatments according to customer's specifications

art. no.			
LA V 34 ...	with air flow chamber		
art. no.			
LA V 35 ...	with air flow chamber		
please indicate: ... $\longleftrightarrow$ 100 150 200 250 300 mm ... fan type 12 = 12 V DC 24 = 24 V DC 48 = 48 V DC			

Technical data of the fans

	... 12	... 24	... 48
type	ebmpapst 8212 JH4	ebmpapst 8214 JH4	ebmpapst 8218 JH4
dimensions	80x80x38 mm	80x80x38 mm	80x80x38 mm
tension	12 V DC	24 V DC	48 V DC
power inout	39 W	38 W	36 W
max. air volume	222 m ³ /h	222 m ³ /h	222 m ³ /h
temperature range	-20°C... +70°C	-20°C... +70°C	-20°C... +70°C
noise level	71 dB(A)	71 dB(A)	71 dB(A)
speed	14,000 min ⁻¹	14,000 min ⁻¹	14,000 min ⁻¹
weight	200 g	200 g	200 g
failure rate (L₁₀)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)

A

Cooling aggregates with axial fan

B

C



D

High performance cooling aggregate

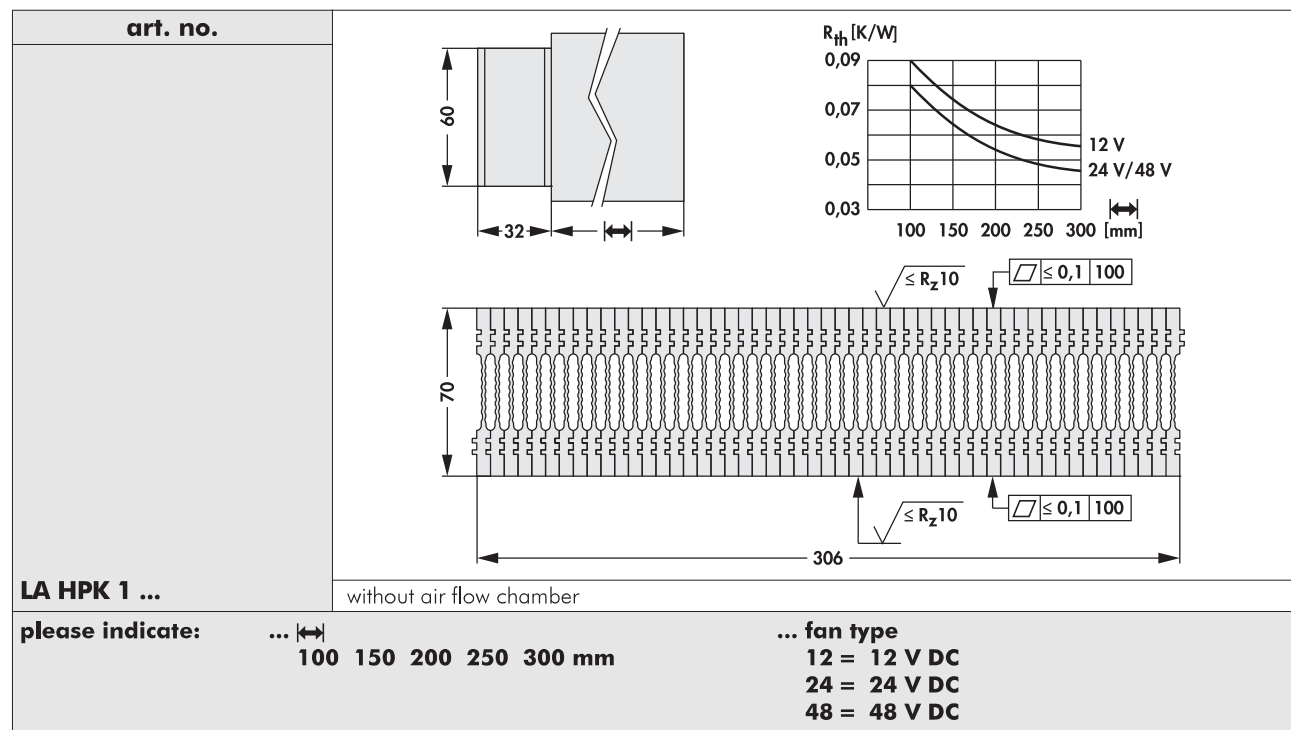
- cooling aggregates of special conception with pressed in fins
- enlarged surface by means of fluted fin geometry
- flow-optimised hollow fin structure
- milled flat mounting surface for component assembly
- special designs and other fans upon request

E

F

G

H



I

Technical data of the fans

	... 12	... 24	... 48
type	ebmpapst 612 JH	ebmpapst 614 J/2HHP	ebmpapst 618 J/2HHP
dimensions	60x60x32 mm	60x60x32 mm	60x60x32 mm
tension	12 V DC	24 V DC	48 V DC
power inout	7.7 W	14.6 W	14.6 W
max. air volume	70 m ³ /h	82 m ³ /h	82 m ³ /h
temperature range	-20°C... +70°C	-20°C... 75°C	-20°C... 75°C
noise level	53 dB(A)	62 dB(A)	62 dB(A)
speed	11,700 min ⁻¹	15,000 min ⁻¹	15,000 min ⁻¹
weight	100 g	100 g	100 g
failure rate (L₁₀)	L ₁₀ < 57,500 h (40°C)	L ₁₀ > 65,000 h (40°C)	L ₁₀ > 65,000 h (40°C)

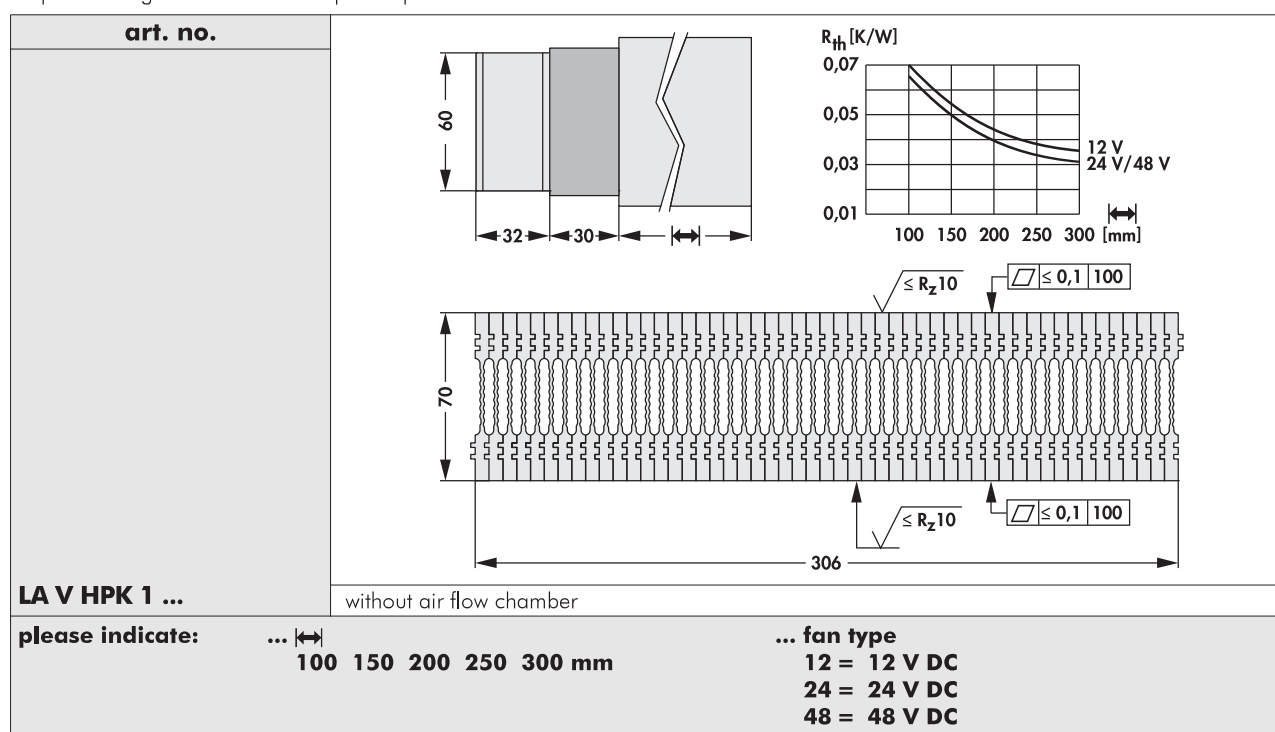
M

N



High performance cooling aggregate

- cooling aggregates of special conception with pressed in fins
- enlarged surface by means of fluted fin geometry
- flow-optimised hollow fin structure
- milled flat mounting surface for component assembly
- special designs and other fans upon request



Technical data of the fans

	... 12	... 24	... 48
type	ebmpapst 612 JH	ebmpapst 614 J/2HHP	ebmpapst 618 J/2HHP
dimensions	60x60x32 mm	60x60x32 mm	60x60x32 mm
tension	12 V DC	24 V DC	48 V DC
power inout	7.7 W	14.6 W	14.6 W
max. air volume	70 m ³ /h	82 m ³ /h	82 m ³ /h
temperature range	-20°C... +70°C	-20°C... 75°C	-20°C... 75°C
noise level	53 dB(A)	62 dB(A)	62 dB(A)
speed	11,700 min ⁻¹	15,000 min ⁻¹	15,000 min ⁻¹
weight	100 g	100 g	100 g
failure rate (L₁₀)	L ₁₀ < 57,500 h (40°C)	L ₁₀ > 65,000 h (40°C)	L ₁₀ > 65,000 h (40°C)

A

B

C

D

High performance cooling aggregate

- cooling aggregates of special conception with pressed in fins
- enlarged surface by means of fluted fin geometry
- flow-optimised hollow fin structure
- milled flat mounting surface for component assembly
- special designs and other fans upon request

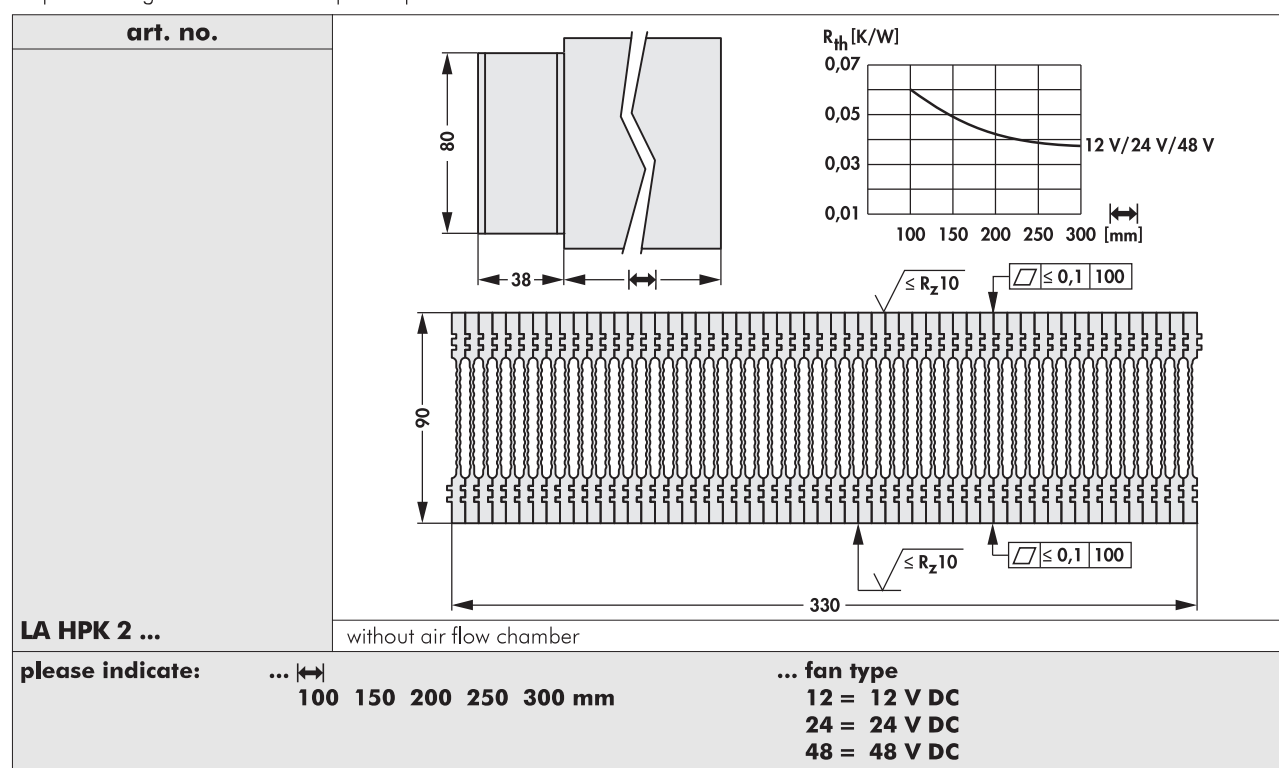
E

F

G

H

I



K

L

M

Technical data of the fans

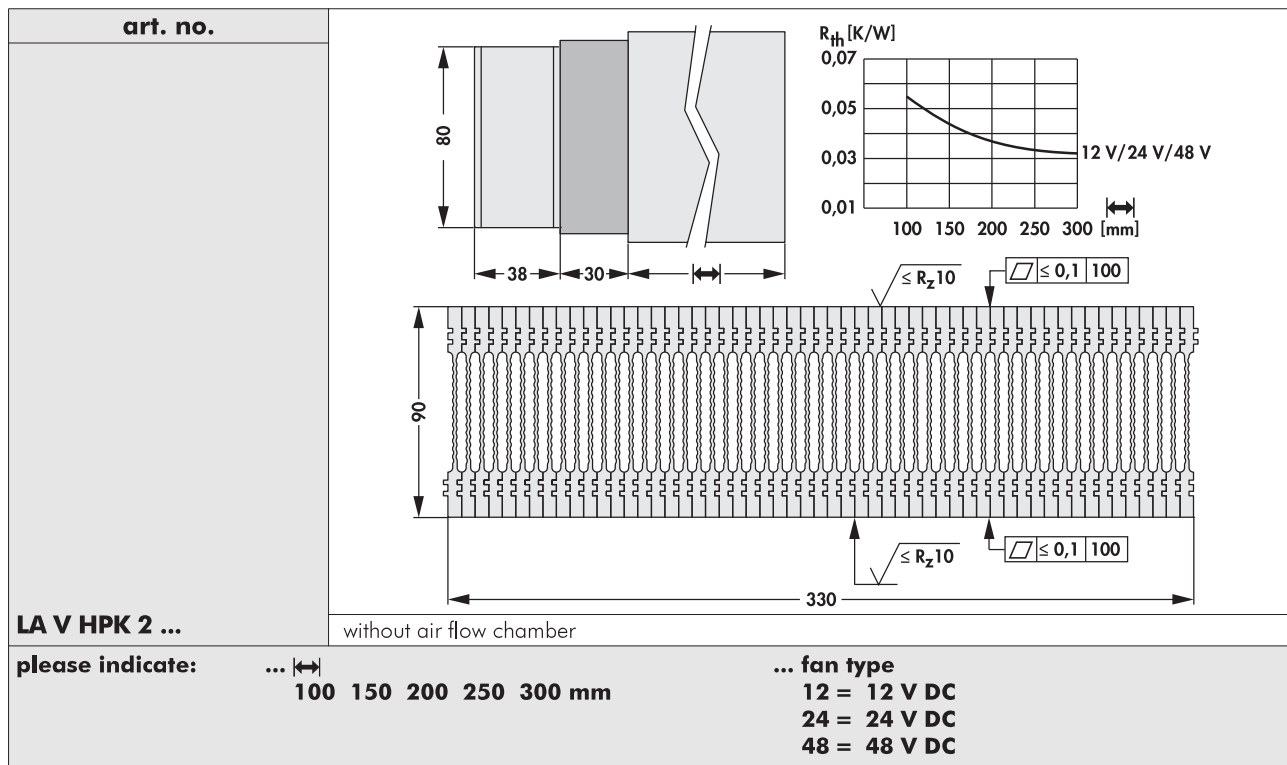
	... 12	... 24	... 48
type	ebmpapst 8212 JH4	ebmpapst 8214 JH4	ebmpapst 8218 JH4
dimensions	80x80x38 mm	80x80x38 mm	80x80x38 mm
tension	12 V DC	24 V DC	48 V DC
power inout	39 W	38 W	36 W
max. air volume	222 m ³ /h	222 m ³ /h	222 m ³ /h
temperature range	-20°C... +70°C	-20°C... +70°C	-20°C... +70°C
noise level	71 dB(A)	71 dB(A)	71 dB(A)
speed	14,000 min ⁻¹	14,000 min ⁻¹	14,000 min ⁻¹
weight	200 g	200 g	200 g
failure rate (L₁₀)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)

N



High performance cooling aggregate

- cooling aggregates of special conception with pressed in fins
- enlarged surface by means of fluted fin geometry
- flow-optimised hollow fin structure
- milled flat mounting surface for component assembly
- special designs and other fans upon request



Technical data of the fans

	... 12	... 24	... 48
type	ebmpapst 8212 JH4	ebmpapst 8214 JH4	ebmpapst 8218 JH4
dimensions	80x80x38 mm	80x80x38 mm	80x80x38 mm
tension	12 V DC	24 V DC	48 V DC
power inout	39 W	38 W	36 W
max. air volume	222 m³/h	222 m³/h	222 m³/h
temperature range	-20°C... +70°C	-20°C... +70°C	-20°C... +70°C
noise level	71 dB(A)	71 dB(A)	71 dB(A)
speed	14,000 min ⁻¹	14,000 min ⁻¹	14,000 min ⁻¹
weight	200 g	200 g	200 g
failure rate (L₁₀)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)	L ₁₀ > 50,000 h (40°C)

A

Cooling aggregates with axial fan

B

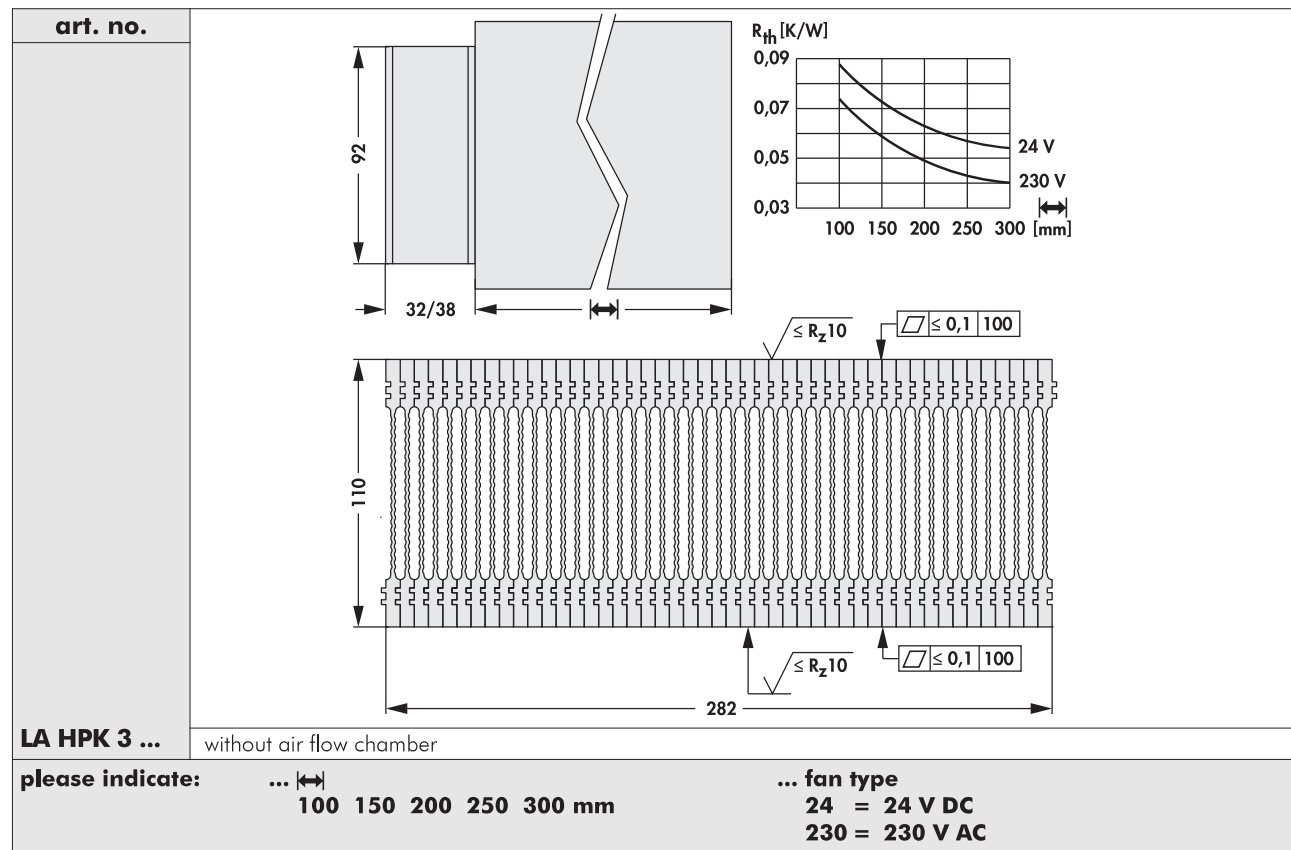
C



D

High performance cooling aggregate

- high performance cooling aggregates of special design
- optimal pressed in single lamellae
- low pressure losses due to adjusted fin geometry
- smallest fin spacings give a big heat exchange area
- special designs according to drawing



K

Technical data of the fans

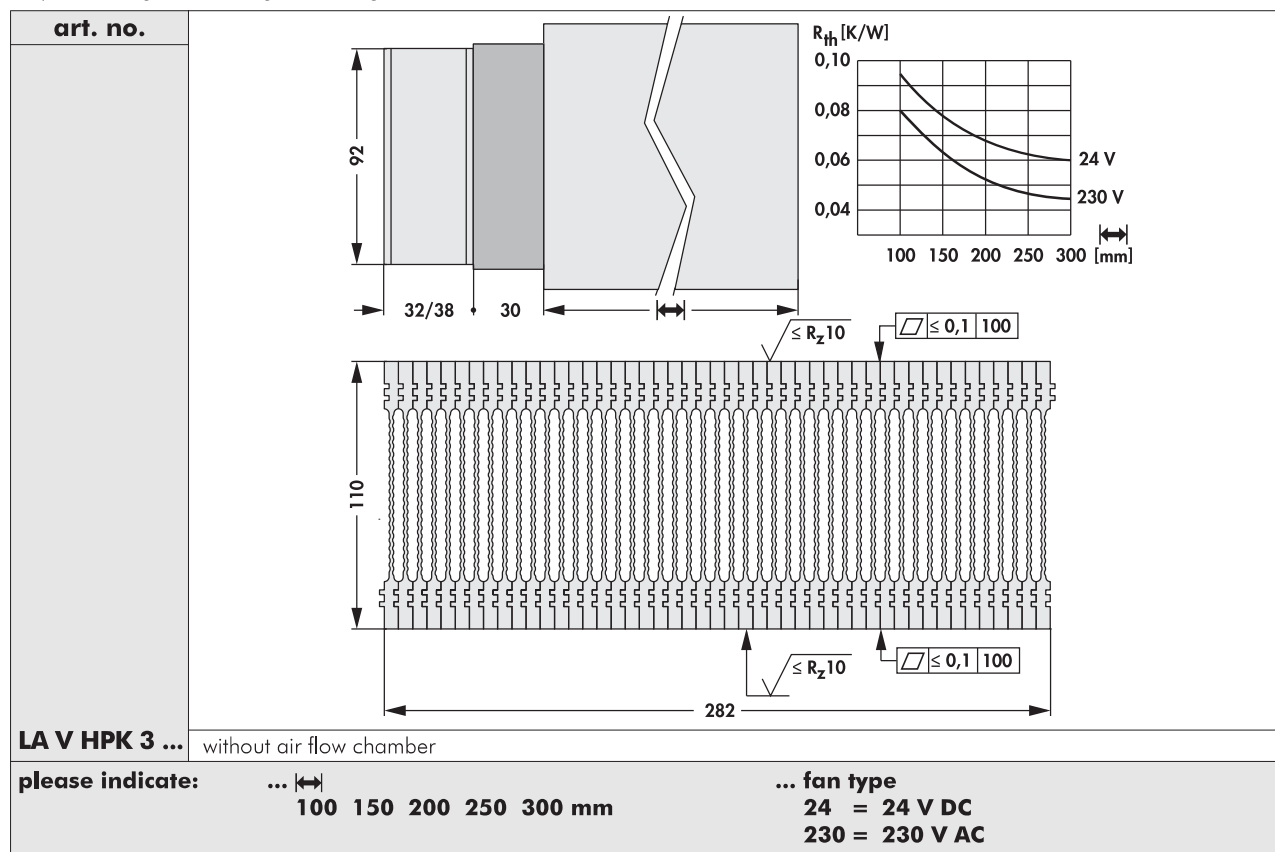
	... 24	... 230
type	ebmpapst 3314 NHH	ebmpapst 3656
dimensions	92x92x32 mm	92x92x38 mm
tension	24 V DC	230 V AC
power inout	3.4 W	12 W
max. air volume	107 m ³ /h	75 m ³ /h
temperature range	-20°C... 75°C	-40°C... +75°C
noise level	42 dB(A)	37 dB(A)
speed	min ⁻¹	2,700 min ⁻¹
weight	190 g	420 g
failure rate (L₁₀)	L ₁₀ < 57,500 h (40°C)	L ₁₀ < 52,500 h (40°C)

N



High performance cooling aggregate

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Technical data of the fans

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A

Cooling aggregates with axial fan

B

C

D

High performance cooling aggregate

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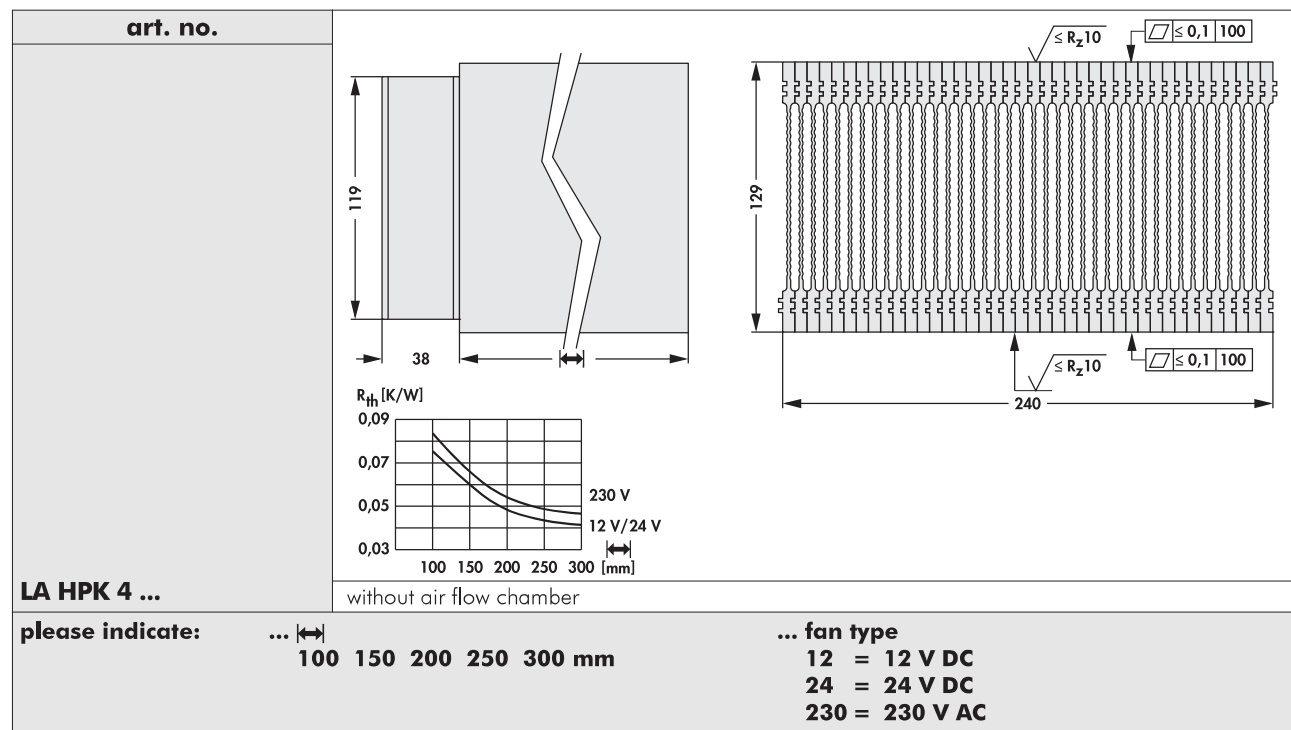
E

F

G

H

I



Technical data of the fans

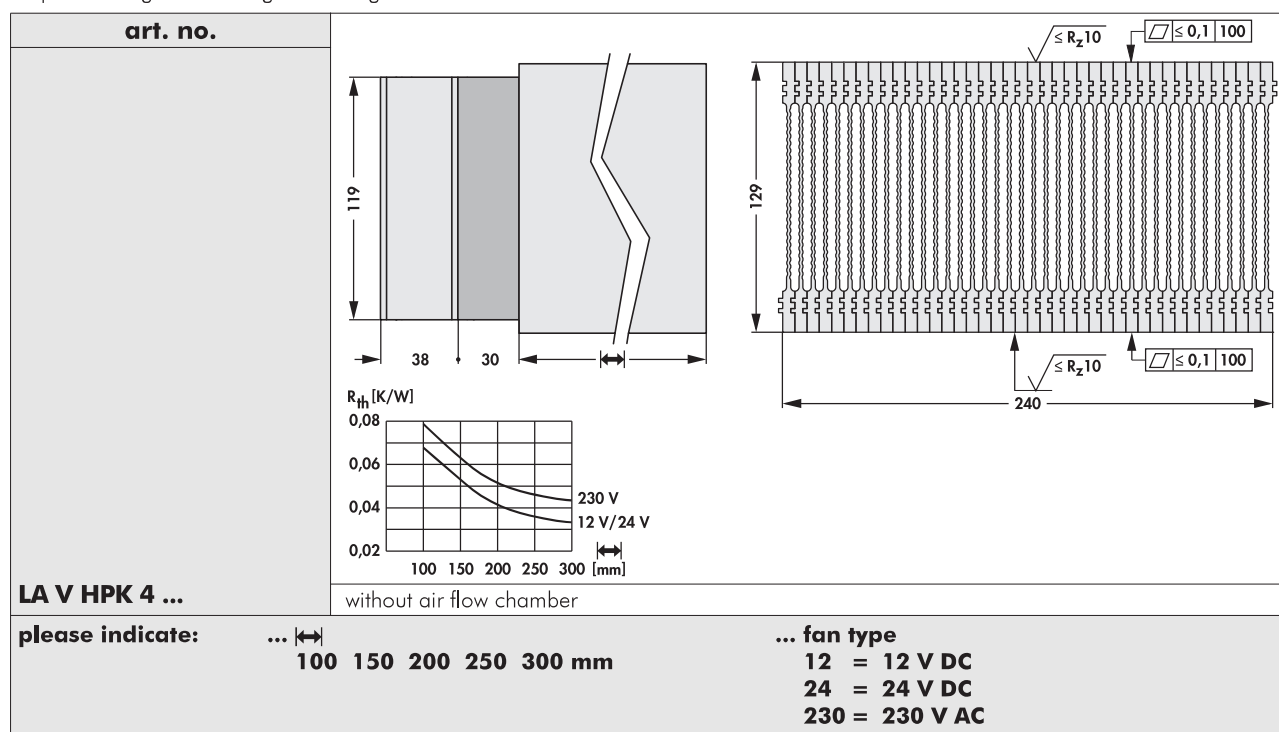
	... 12	... 24	... 230
type	ebmpapst 4112NH3	ebmpapst 4114NH3	ebmpapst 4656N
dimensions	119x119x38 mm	119x119x38 mm	119x119x38 mm
tension	12 V DC	24 V DC	230 V AC
power inout	21 W	19.5 W	19 W
max. air volume	310 m ³ /h	310 m ³ /h	160 m ³ /h
temperature range	-20°C... +65°C	-20°C... +65°C	-40°C... +85°C
noise level	65 dB(A)	65 dB(A)	47 dB(A)
speed	6,000 min ⁻¹	6,000 min ⁻¹	2,650 min ⁻¹
weight	390 g	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 60,000 h (40°C) L ₁₀ > 37,500 h (tmax)	L ₁₀ > 65,000 h (40°C) L ₁₀ > 37,500 h (tmax)	L ₁₀ < 37,500 h (40°C)

N



High performance cooling aggregate

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- optimal pressed in single lamellae
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Technical data of the fans

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A

Cooling aggregates with axial fan

B

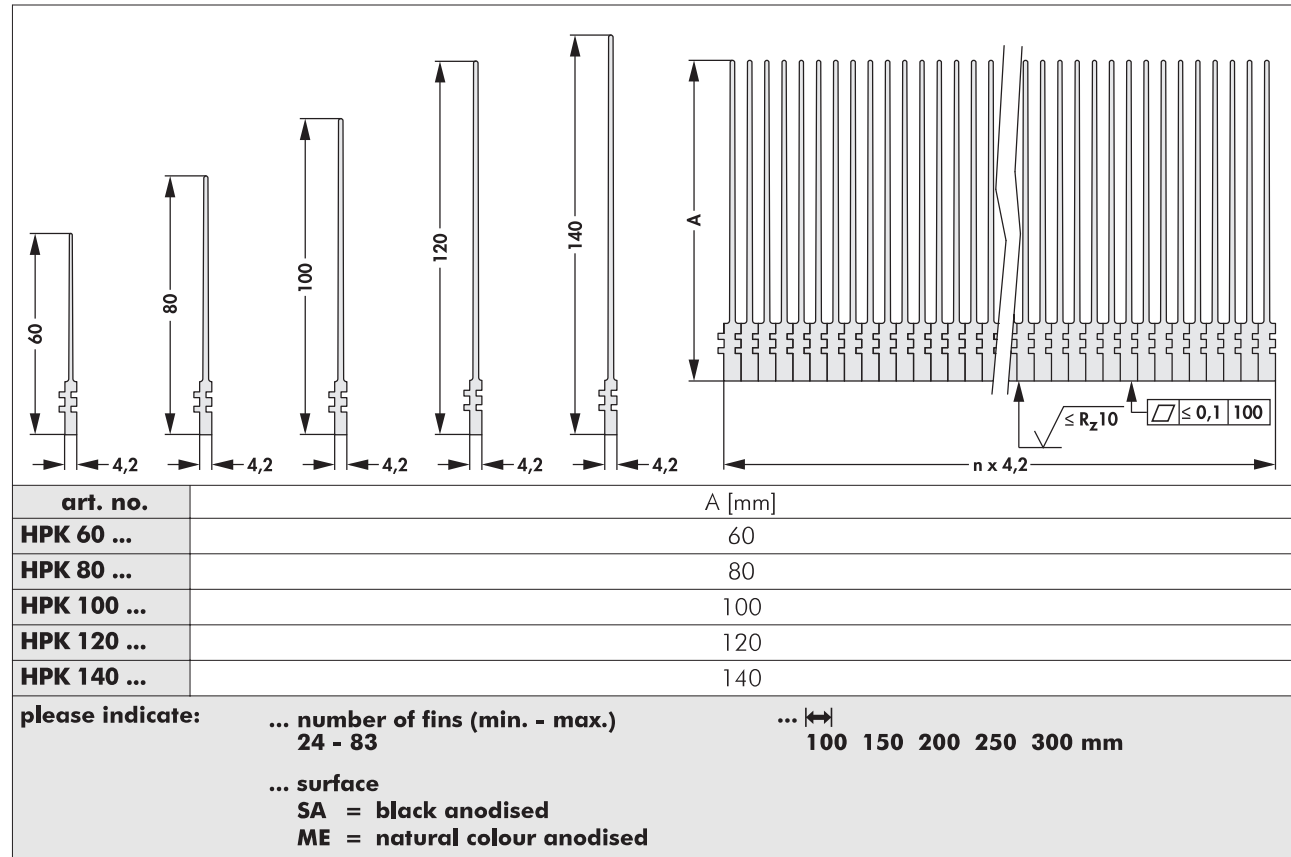
High performance heatsinks

- flexible designable heatsink solutions
- modular system with different fin heights
- for free and forced convection
- milled flat semiconductor mounting surface
- customer specific designs, machinings and surfaces upon request

C

D

E



F

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