



Kühlsysteme
Cooling systems

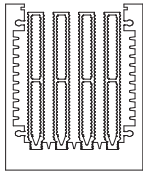
Kühlsysteme *Cooling systems*



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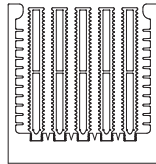
KS 62.3

System ALS 62
Seite · page 64



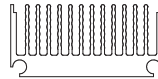
KS 80.20

System ALS 80
Seite · page 65



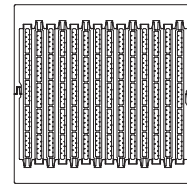
KS 81.211

System KL 2
Seite · page 64



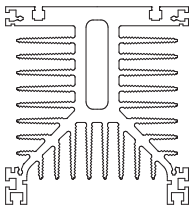
KS 122.5

System ALS 122.5
Seite · page 65



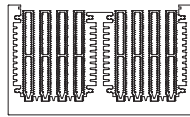
KS 125.7

System ALS 125.7
Seite · page 66

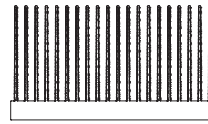


KS 125.10

System ALS 125
Seite · page 66

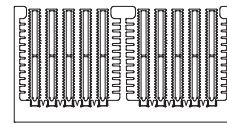


KS 150.32



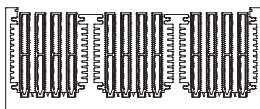
KS 160.16

System ALS 160.16
Seite · page 67



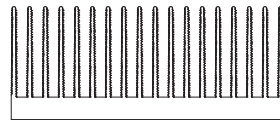
KS 188.2

System ALS 188.2
Seite · page 67



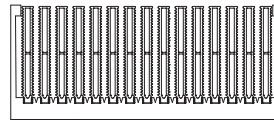
KS 200.18

System QLS 200.18/RLS 200.18
Seite · page 68



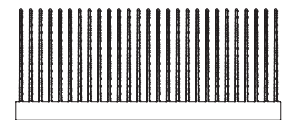
KS 200.25

System QLS 200.25/RLS 200.25
Seite · page 69



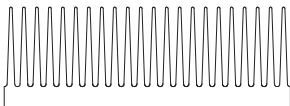
KS 200.36

System QLS 200.36/RLS 200.36
Seite · page 70



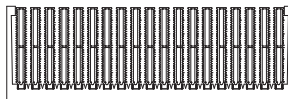
KS 216.2

System QLS 216.2/RLS 216.2
Seite · page 71



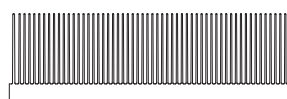
KS 250.16

System QLS 250.16/RLS 250.16
Seite · page 72



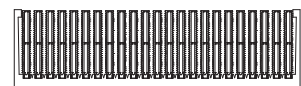
KS 253.3

System QLS 250.16/RLS 250.16
Seite · page 73



KS 300.14

System QLS 300.14/RLS 300.14
Seite · page 74



KS 300.19

System QLS 300.19/RLS 300.19
Seite · page 75



KS 300.29

System QLS 300.29/RLS 300.29
Seite · page 76



KS 392.1



Kühlungsprofile für Zwangskühlung • Profiles for forced cooling

Für forcierte Kühlung mit Lüfter lassen sich an Hand der nachfolgenden Kurve abhängig von Luftgeschwindigkeit ω entsprechende Korrekturwerte F ablesen.

For forced cooling using fans the corresponding correction values F can be taken from the following curve depending on air velocity ω .

Der tatsächliche Wert für R_{thF} ergibt sich zu

$$R_{thF} = F \times R_{thK}$$

The actual value for R_{thF} results from

$$R_{thF} = F \times R_{thK}$$

Für forcierte Kühlung ist die Oberflächenbeschaffenheit des Kühlers praktisch ohne Bedeutung. Im Gegensatz zur Konvektionskühlung, bei der ein bestimmter Rippenabstand nicht unterschritten werden sollte, muss für forcierte Kühlung eine möglichst große Fläche mit entsprechend vielen Rippen vorgesehen werden.

The surface property of the heat sink is of no practical significance for forced cooling. Unlike convection cooling where a certain space between the fins must be respected, forced cooling demands as large a surface as possible with a corresponding number of fins.

R_{thF} = thermischer Widerstand für Zwangskonvektion

R_{thF} = thermic resistor for forced cooling

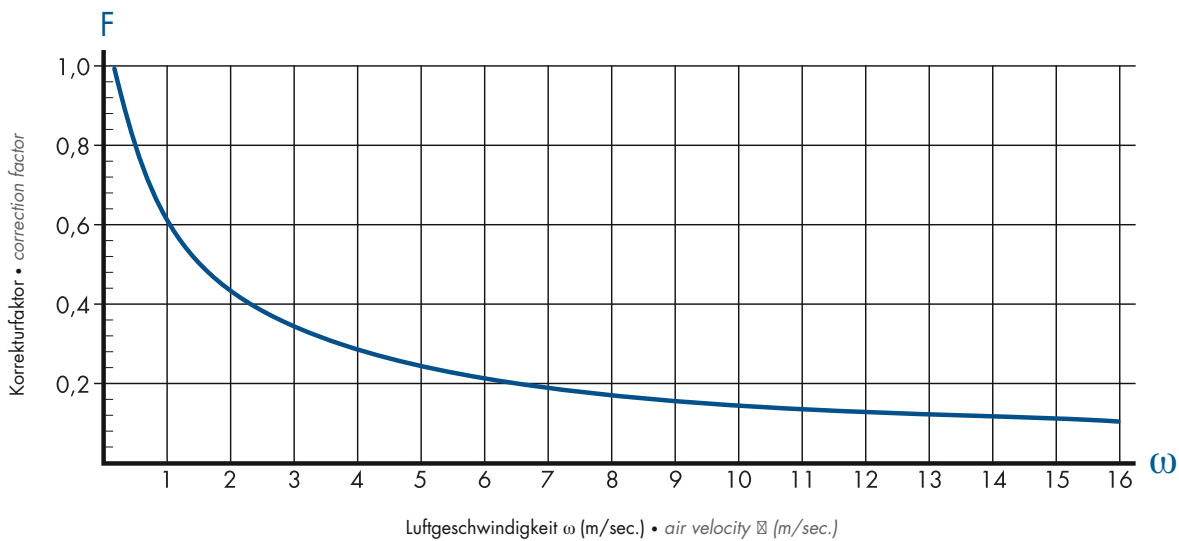
R_{thK} = thermischer Widerstand für freie Konvektion

R_{thK} = thermic resistor for convection cooling

F = Korrekturfaktor

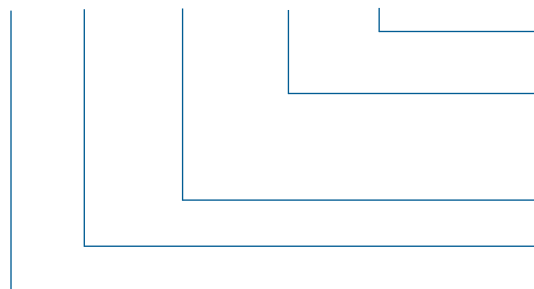
F = correction factor

Korrekturkennlinie für Zwangskonvektion • Graphic for forced convection



Bestellbezeichnung
Order example

ALS 122.5 - 200 - A/R - 10



Montageflächen gefräst 10 μ m
Mounting surface milled 10 μ m

Eloxal A = silberfarben,
R = roh unbearbeitet
Anodised A = silver coloured anodised,
R = raw untreated

Länge der Kühlschiene • heat sink length

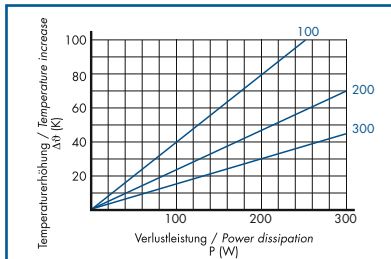
KS 122.5 Kühlschiene • heat sink

Kühlsystem komplett,
Typ-Bezeichnung, Lüfter
cooling system, complete,
designation of type, fan

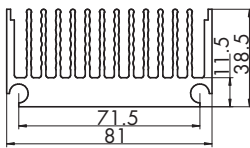
KL 2

System bestehend aus 2 isolierten Segmenten u. Lüfter
System consisting of two isolated segments and ventilator

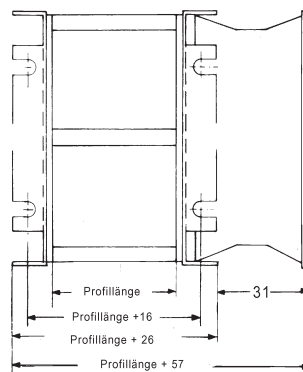
Abmessungen · Dimensions	80x80x38 mm
Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	11 W
Geräuschpegel · Noise level	32 dBA
Luftleistung · Air volume	44 m ³ /h



Kurve für KS 81.211 = 1/2 System vom Typ KL2
Curve for KS 81.211 = 1/2 system type KL2



Verwendetes Profil · Profile used: KS 81.211



Geamtlänge mit Lüfter
Profillänge + 57 mm
Gesamtlänge ohne Lüfter
Profillänge + 20 mm

Total length with ventilator
Profile length + 57 mm
Total length without ventilator
Profile length + 20 mm

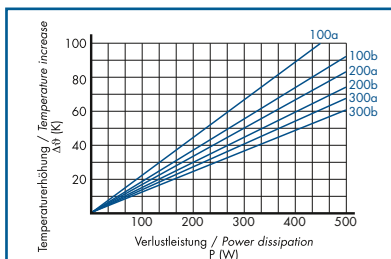
Befestigungsmaß = Profillänge + 16 mm
Mounting dimension = Profile length + 16 mm

Führungsplatte
guide plate

Isolationsabstand und Kühlkörper = 2mm
Insulating and heat sink distance = 2 mm

ALS 62 · ALS 62.1

Abmessungen · Dimensions	60x60x25 mm
Spannung · Voltage	12 V DC
Leistungsaufnahme · Power input	2,5 W
Geräuschpegel · Noise level	32 dBA
Luftleistung · Air volume	44 m ³ /h



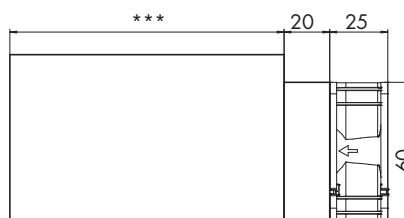
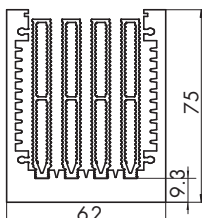
ALS 62 mit Luftkammer
with air-chamber

ALS 62.1 ohne Luftkammer
without air-chamber

a) Lüfter bei Nennspannung 12V
Fan at nominal voltage 12V

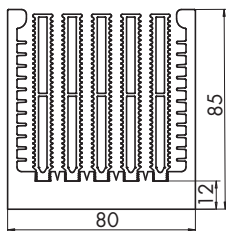
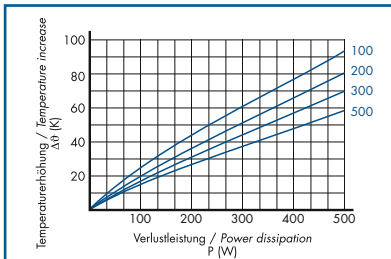
b) Lüfter bei max. zulässiger Spannung 15V
Fan at max. admissible voltage 15V

*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications

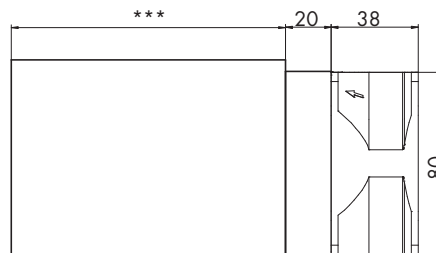


ALS 80

Abmessungen · Dimensions	80x80x38 mm
Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	11 W
Geräuschpegel · Noise level	32 dBA
Luftleistung · Air volume	44 m ³ /h

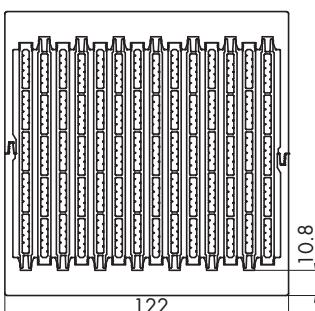
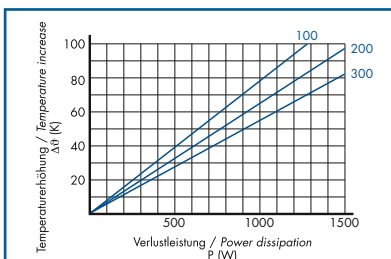


*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications



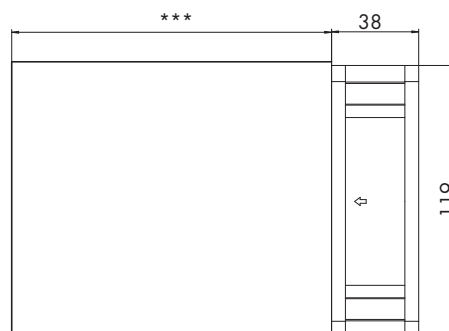
ALS 122.5

Abmessungen · Dimensions	119x119x38 mm
Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	18 W
Geräuschpegel · Noise level	42 dBA
Luftleistung · Air volume	160 m ³ /h



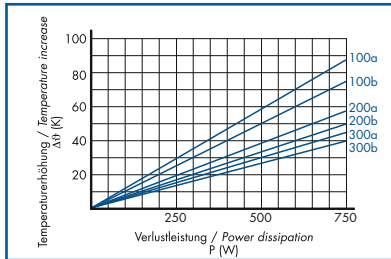
beidseitig bestückbar · filled on both sides

*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications



ALS 125 · 125.1

Abmessungen · Dimensions	60x60x25 mm
Spannung · Voltage	12 V DC
Leistungsaufnahme · Power input	2,5 W
Geräuschpegel · Noise level	40 dBA
Luftleistung · Air volume	40 m ³ /h



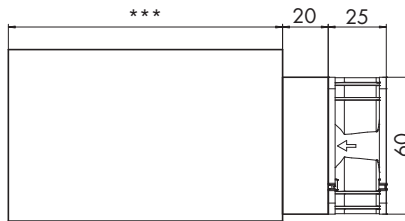
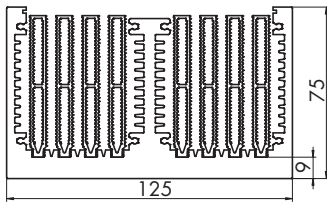
ALS 125 mit Luftkammer
with air-chamber

ALS 125.1 ohne Luftkammer
without air-chamber

a) Lüfter bei Nennspannung 12V
Fan at nominal voltage 12V

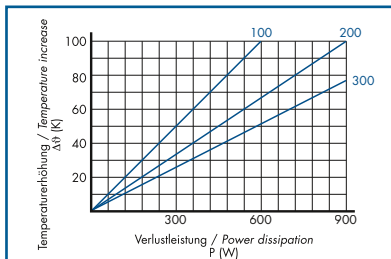
b) Lüfter bei max. zulässiger Spannung 15V
Fan at max. admissible voltage 15V

*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications

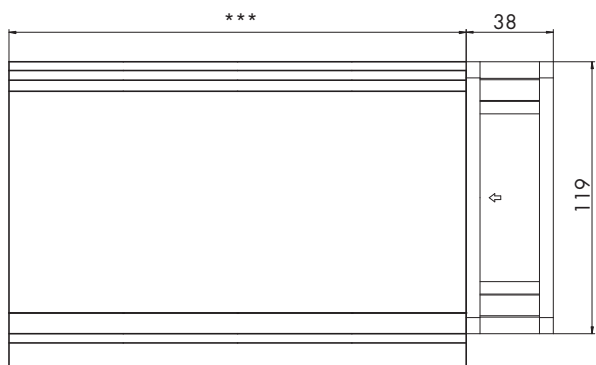
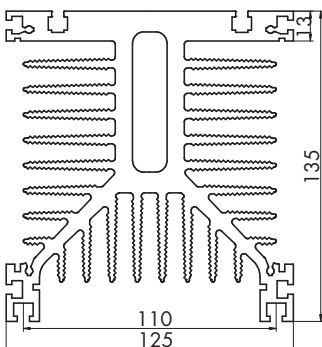


ALS 125.7

Abmessungen · Dimensions	119x119x38 mm
Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	18 W
Geräuschpegel · Noise level	42 dBA
Luftleistung · Air volume	160 m ³ /h

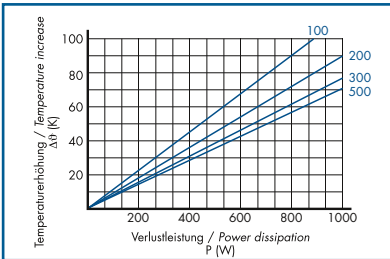


*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications

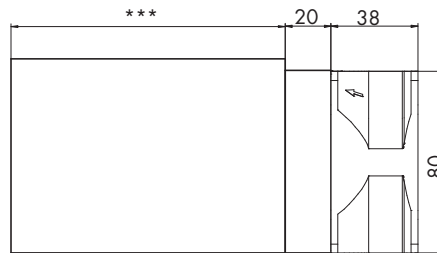
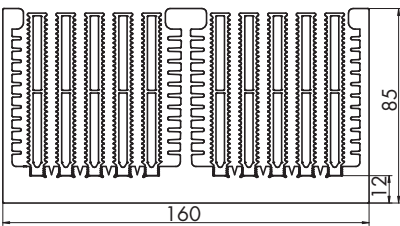


ALS 160.16

Abmessungen · Dimensions	80x80x38 mm
Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	11 W
Geräuschpegel · Noise level	42 dBA
Luftleistung · Air volume	44 m ³ /h

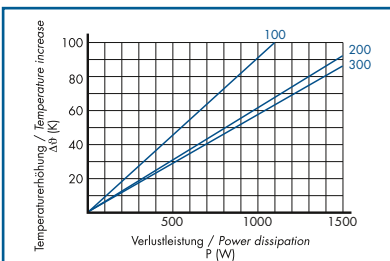


*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications

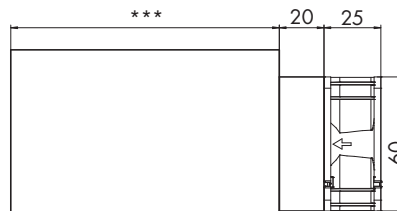
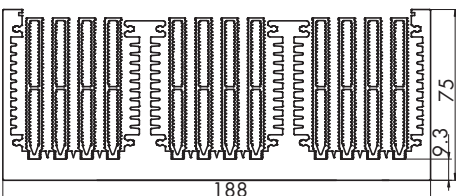


ALS 188.2

Abmessungen · Dimensions	60x60x25 mm
Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	2,5 W
Geräuschpegel · Noise level	40 dBA
Luftleistung · Air volume	40 m ³ /h

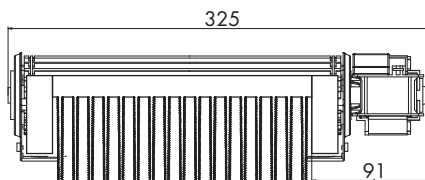
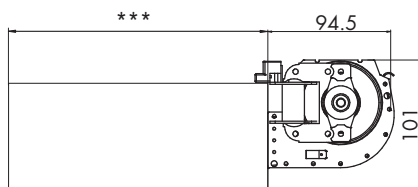
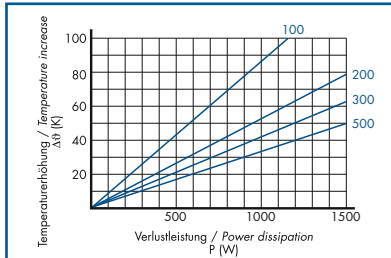


*** Länge des Kühlprofils nach Kundenwunsch
Length of heat sink profile according to customer's specifications



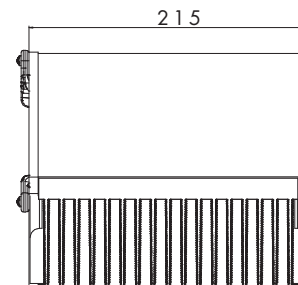
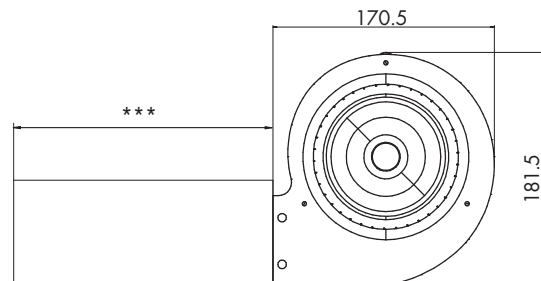
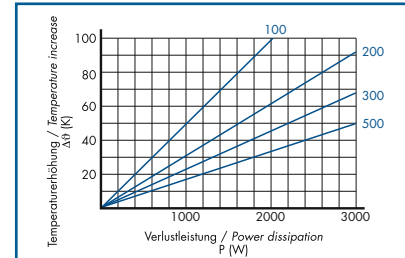
QLS 200.18

Querstromlüfter
Cross-flow ventilator



RLS 200.18

Radialstromlüfter
Radial ventilator



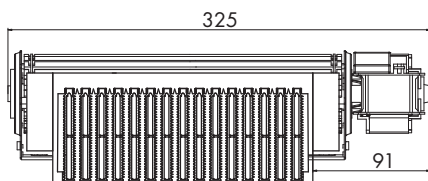
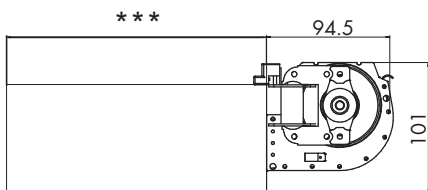
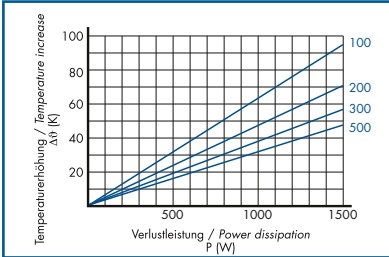
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	40 W
Geräuschpegel · Noise level	50 dBA
Luftleistung · Air volume	170 m³/h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	3 μ F
Leistungsaufnahme · Power input	200 W
Geräuschpegel · Noise level	59 dBA
Luftleistung · Air volume	685 m³/h

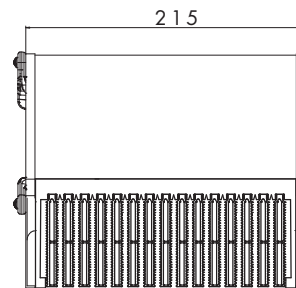
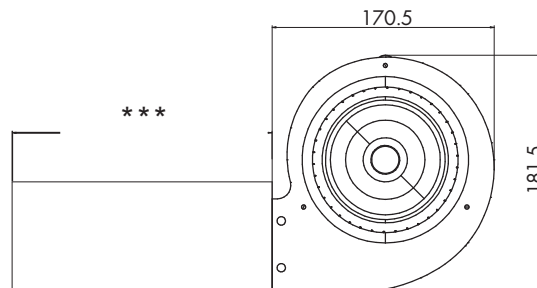
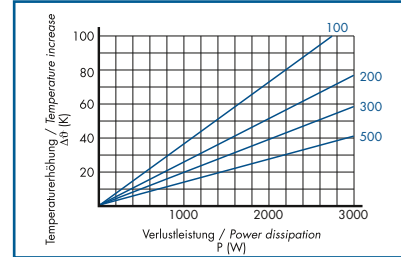
QLS 200.25

Querstromlüfter
Cross-flow ventilator



RLS 200.25

Radialstromlüfter
Radial ventilator



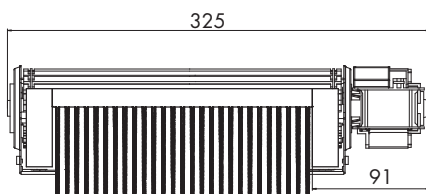
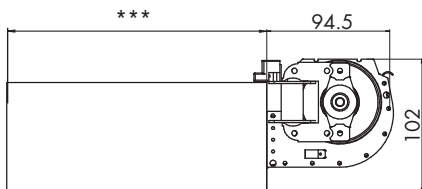
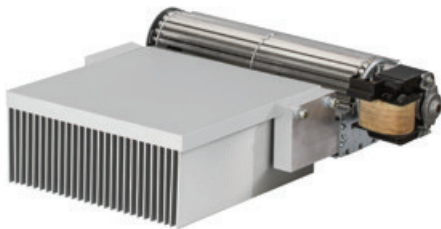
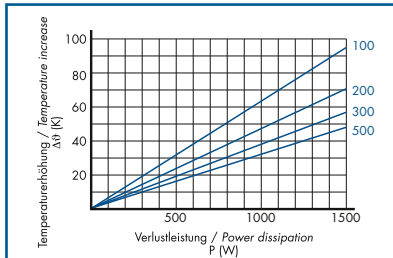
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	40 W
Geräuschpegel · Noise level	50 dBA
Luftleistung · Air volume	170 m³/h

Spannung · Voltage	220-230 V/50 Hz
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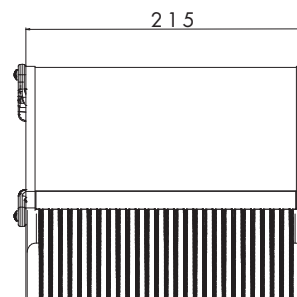
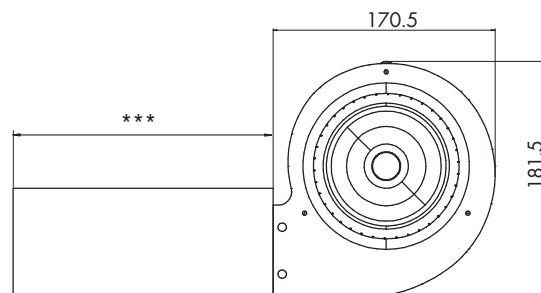
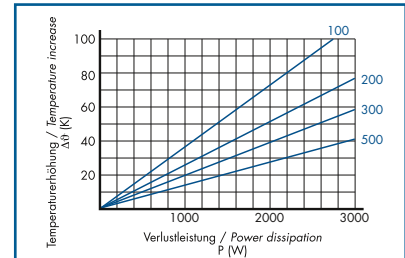
QLS 200.36

Querstromlüfter
Cross-flow ventilator



RLS 200.36

Radialstromlüfter
Radial ventilator



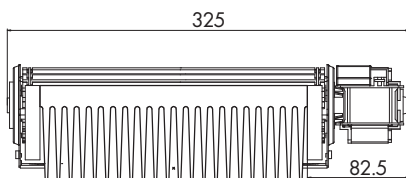
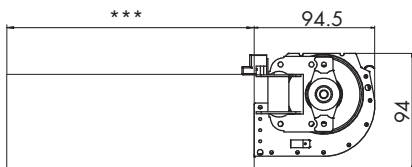
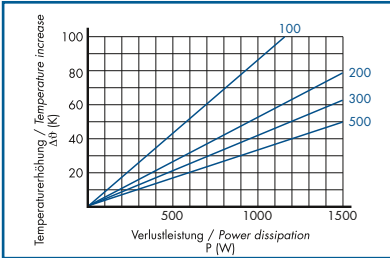
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	40 W
Geräuschpegel · Noise level	50 dBA
Luftleistung · Air volume	170 m³/h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	3 μ F
Leistungsaufnahme · Power input	200 W
Geräuschpegel · Noise level	59 dBA
Luftleistung · Air volume	685 m³/h

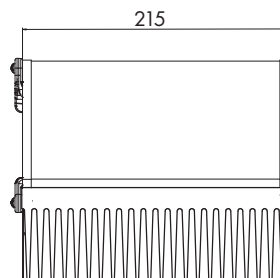
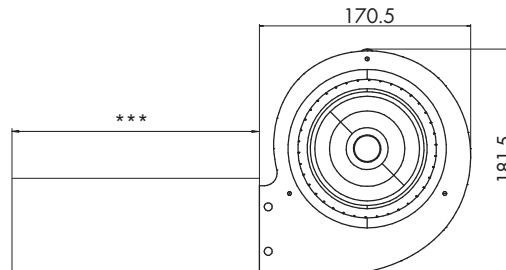
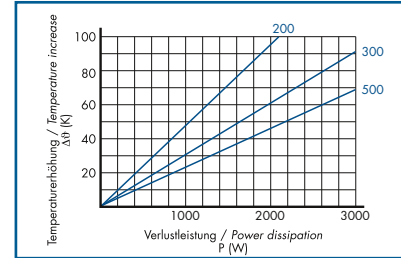
QLS 216.2

Querstromlüfter
Cross-flow ventilator



RLS 216.2

Radialstromlüfter
Radial ventilator



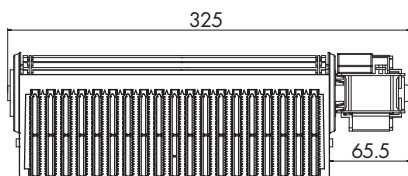
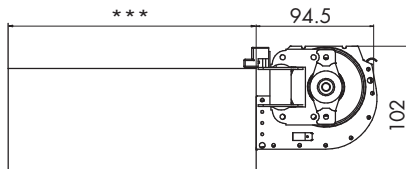
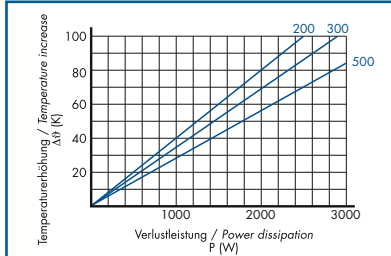
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	40 W
Geräuschpegel · Noise level	50 dBA
Luftleistung · Air volume	170 m³/h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	3 µF
Leistungsaufnahme · Power input	190 W
Geräuschpegel · Noise level	59 dBA
Luftleistung · Air volume	685 m³/h

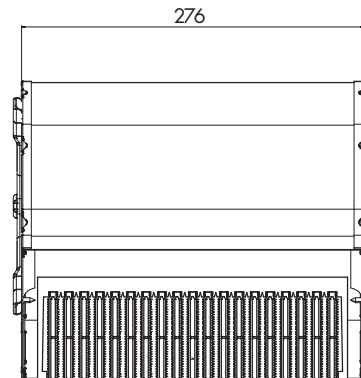
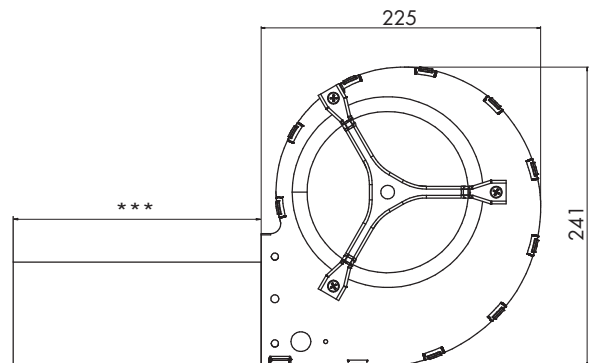
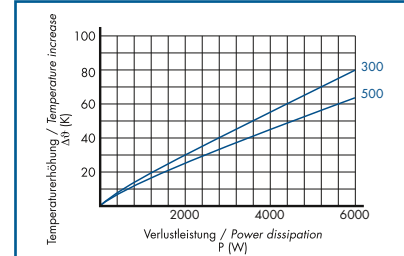
QLS 250.16

Querstromlüfter
Cross-flow ventilator



RLS 250.16

Radialstromlüfter
Radial ventilator



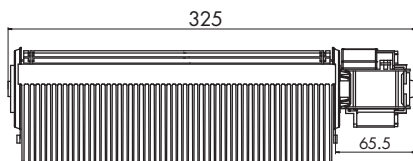
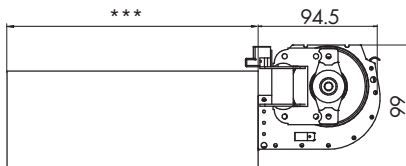
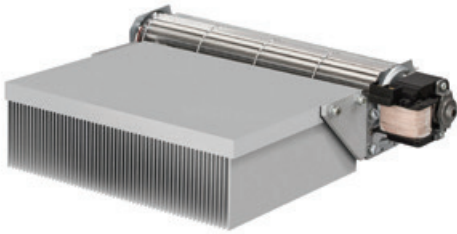
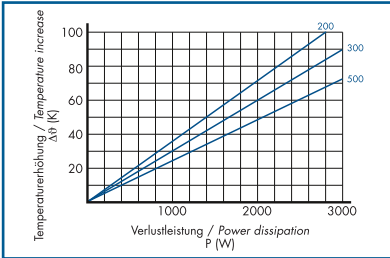
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	40 W
Geräuschpegel · Noise level	50 dBA
Luftleistung · Air volume	170 m ³ /h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	10 µF
Leistungsaufnahme · Power input	365 W
Geräuschpegel · Noise level	62 dBA
Luftleistung · Air volume	1200 m ³ /h

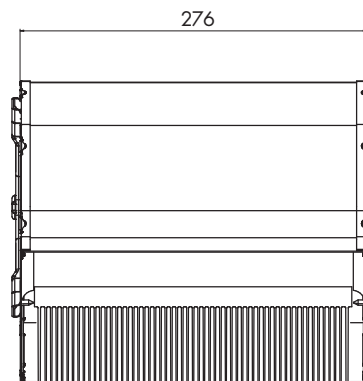
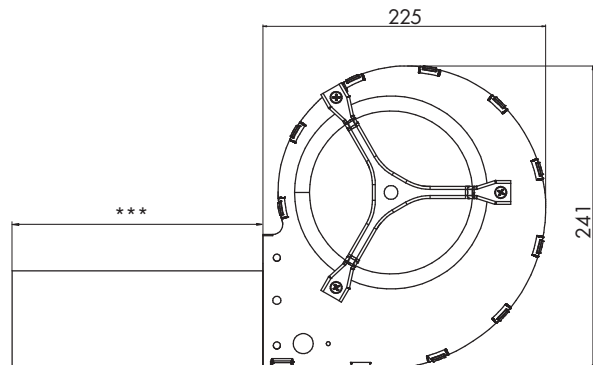
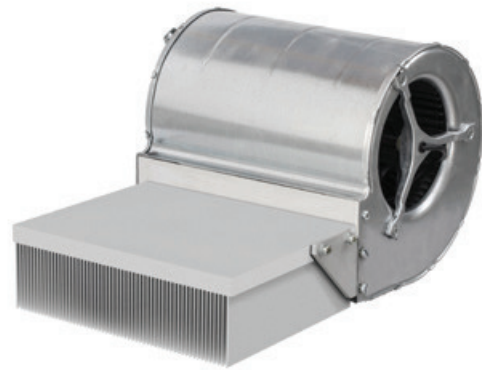
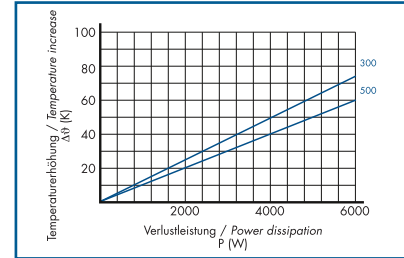
QLS 253.3

Querstromlüfter
Cross-flow ventilator



RLS 253.3

Radialstromlüfter
Radial ventilator



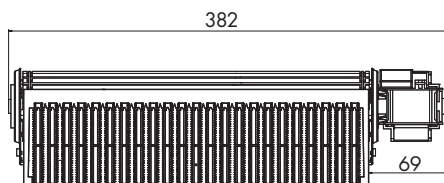
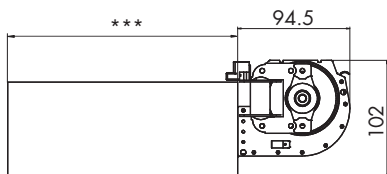
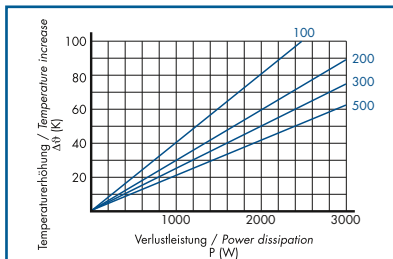
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	40 W
Geräuschpegel · Noise level	50 dBA
Luftleistung · Air volume	170 m ³ /h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	10 μ F
Leistungsaufnahme · Power input	365 W
Geräuschpegel · Noise level	62 dBA
Luftleistung · Air volume	1200 m ³ /h

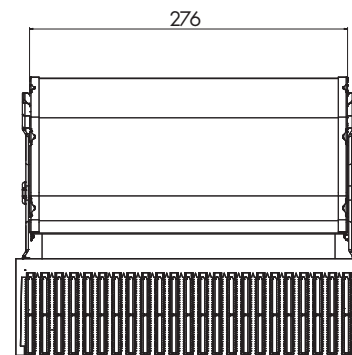
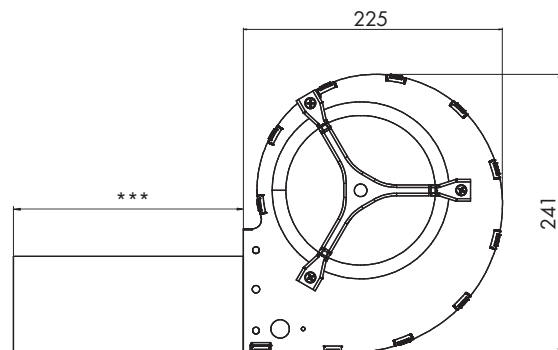
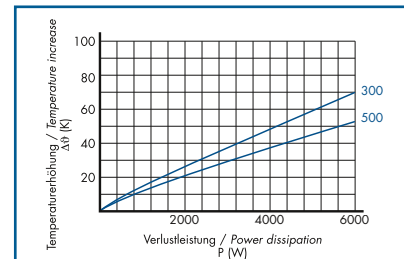
QLS 300.14

Querstromlüfter
Cross-flow ventilator



RLS 300.14

Radialstromlüfter
Radial ventilator



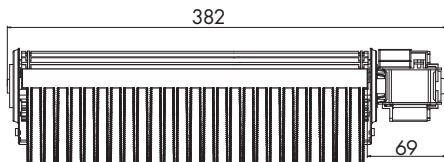
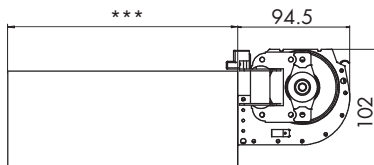
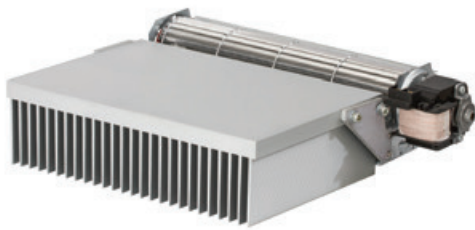
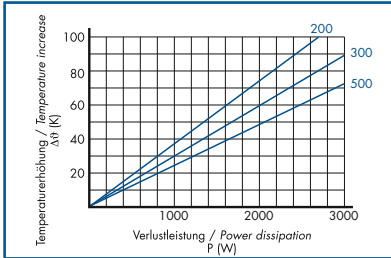
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	42 W
Geräuschpegel · Noise level	53 dBA
Luftleistung · Air volume	238 m³/h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	10 µF
Leistungsaufnahme · Power input	365 W
Geräuschpegel · Noise level	62 dBA
Luftleistung · Air volume	1200 m³/h

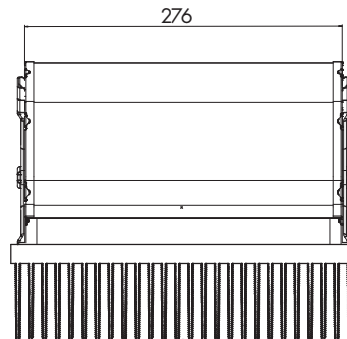
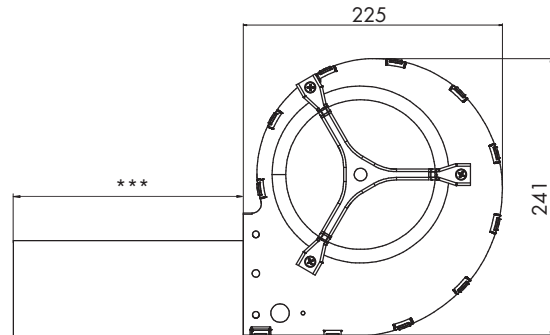
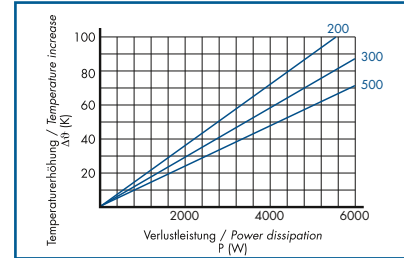
QLS 300.19

Querstromlüfter
Cross-flow ventilator



RLS 300.19

Radialstromlüfter
Radial ventilator



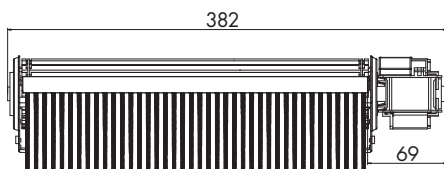
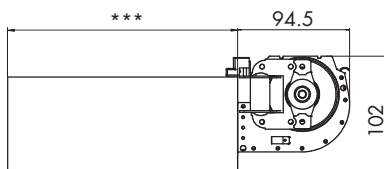
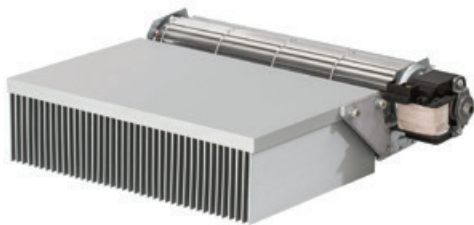
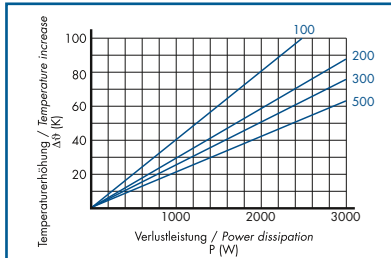
*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	47 W
Geräuschpegel · Noise level	53 dBA
Luftleistung · Air volume	263 m³/h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	10 µF
Leistungsaufnahme · Power input	410 W
Geräuschpegel · Noise level	64 dBA
Luftleistung · Air volume	1195 m³/h

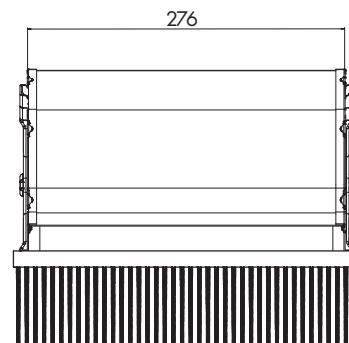
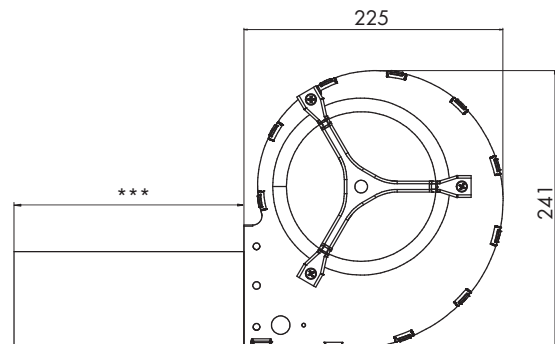
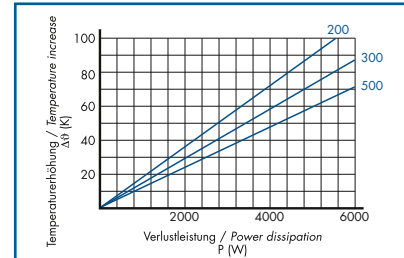
QLS 300.29

Querstromlüfter
Cross-flow ventilator



RLS 300.29

Radialstromlüfter
Radial ventilator



*** Länge des Kühlprofils nach Kundenwunsch · Length of heat sink profile according to customer's specifications

Spannung · Voltage	220-230 V/50 Hz
Leistungsaufnahme · Power input	47 W
Geräuschpegel · Noise level	53 dBA
Luftleistung · Air volume	263 m³/h

Spannung · Voltage	220-230 V/50 Hz
Kondensator · Capacitor	10 μ F
Leistungsaufnahme · Power input	410 W
Geräuschpegel · Noise level	64 dBA
Luftleistung · Air volume	1195 m³/h