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► Diagram performa – Pengatur klimatisasi



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Rittal – The System.

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ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

Diagram performa

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Heater enklosur

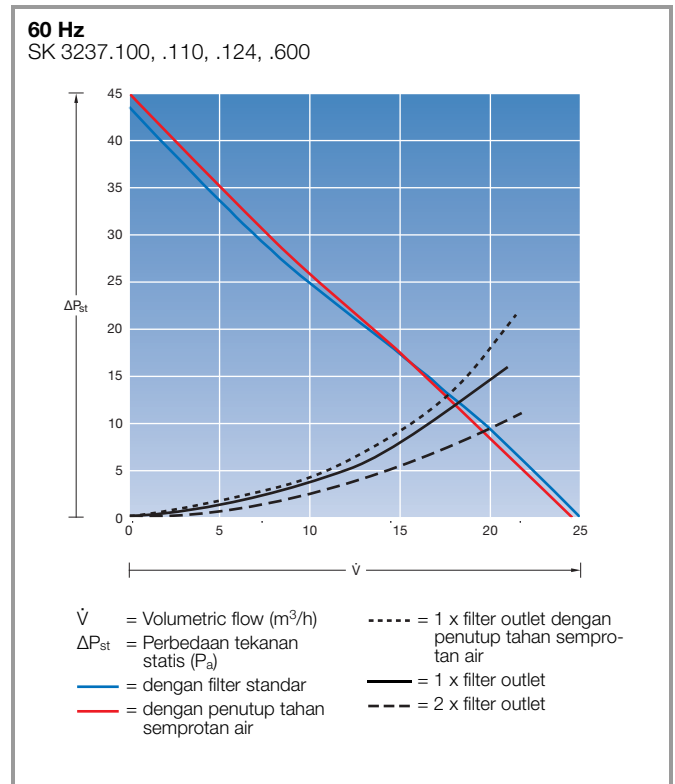
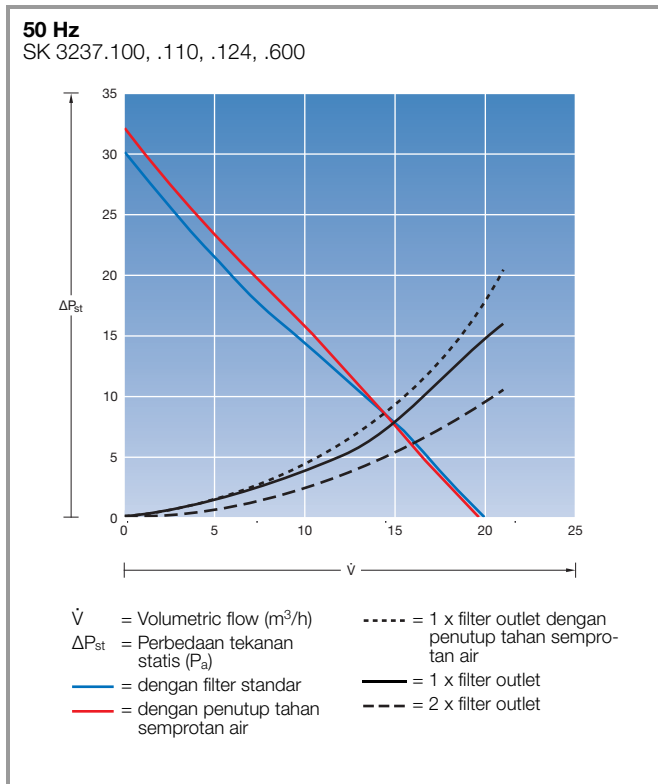
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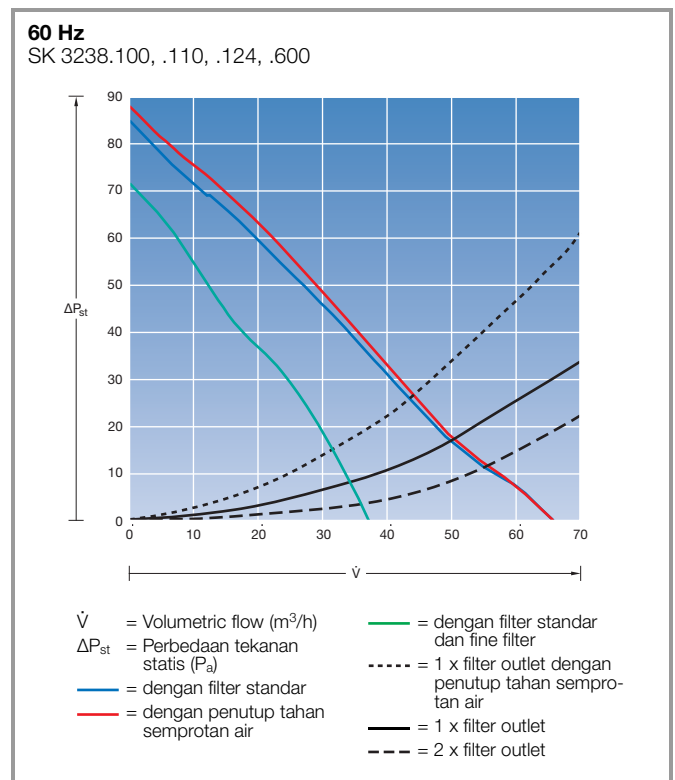
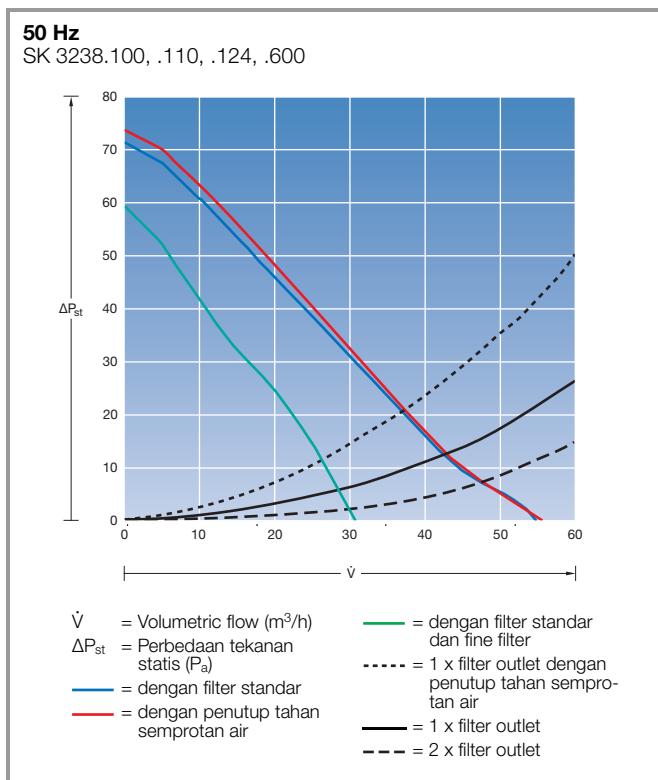
Pendinginan udara

Kipas filter TopTherm dan kipas filter TopTherm EMC

Output udara 20/25 m³/h

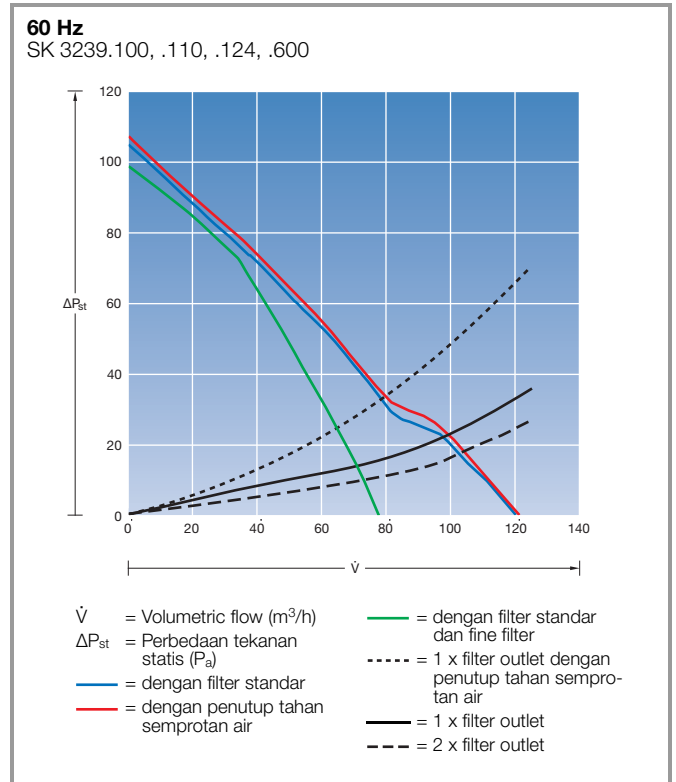
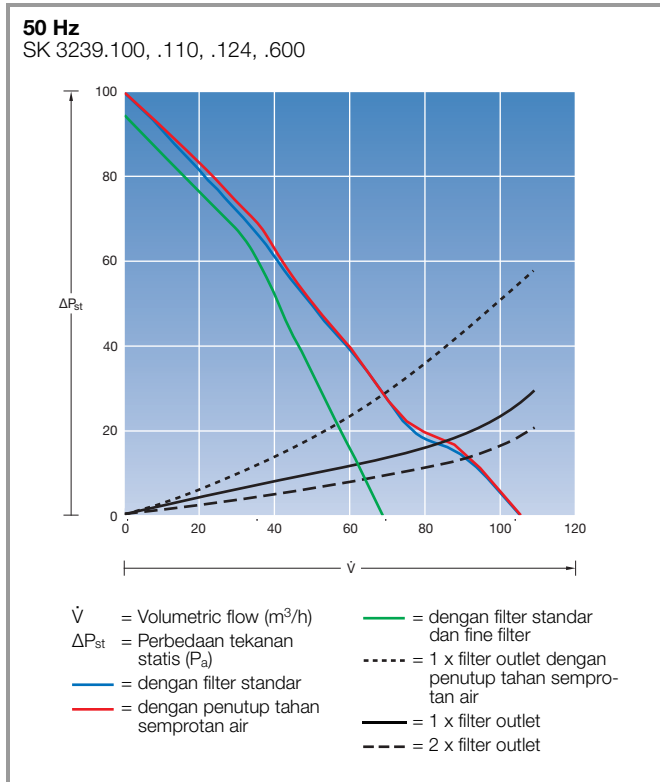


Output udara 55/66 m³/h

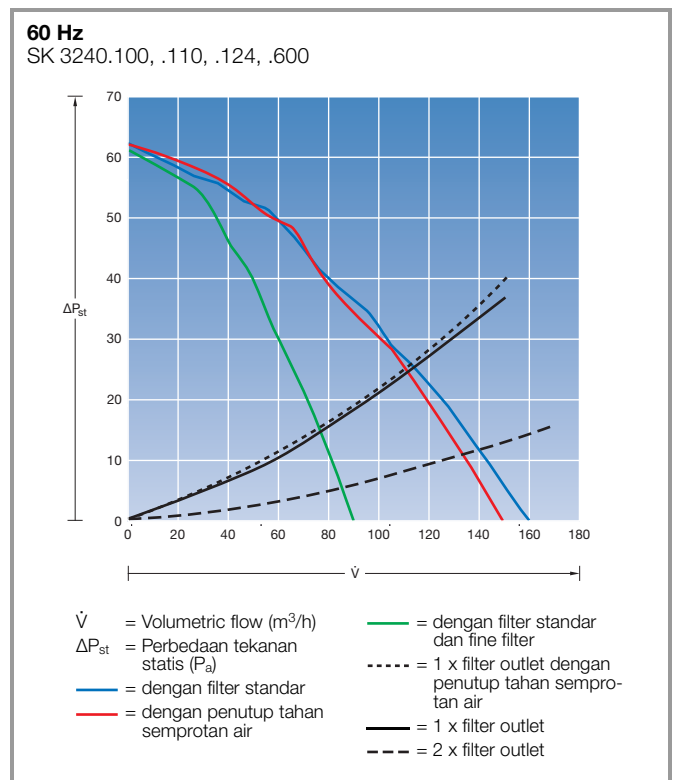
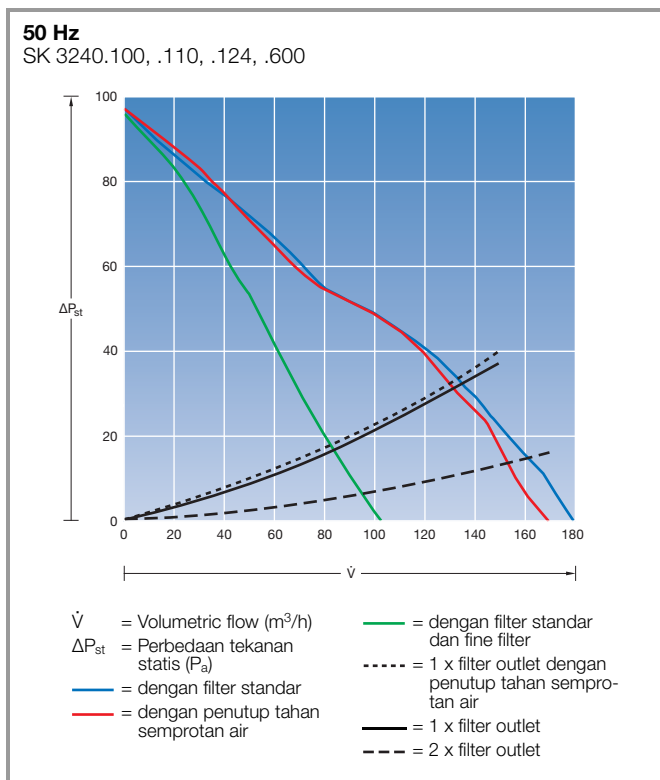


Kipas filter TopTherm dan kipas filter TopTherm EMC

Output udara 105/120 m³/h



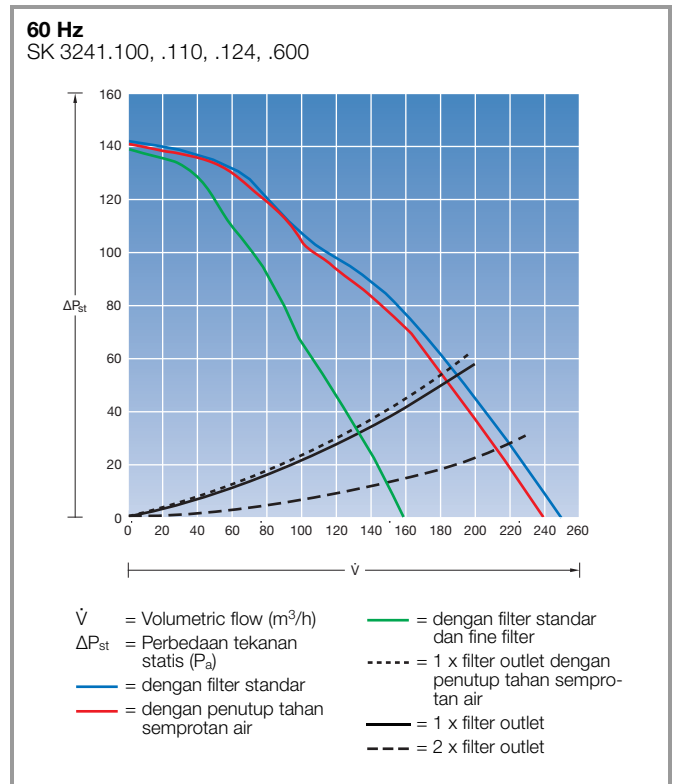
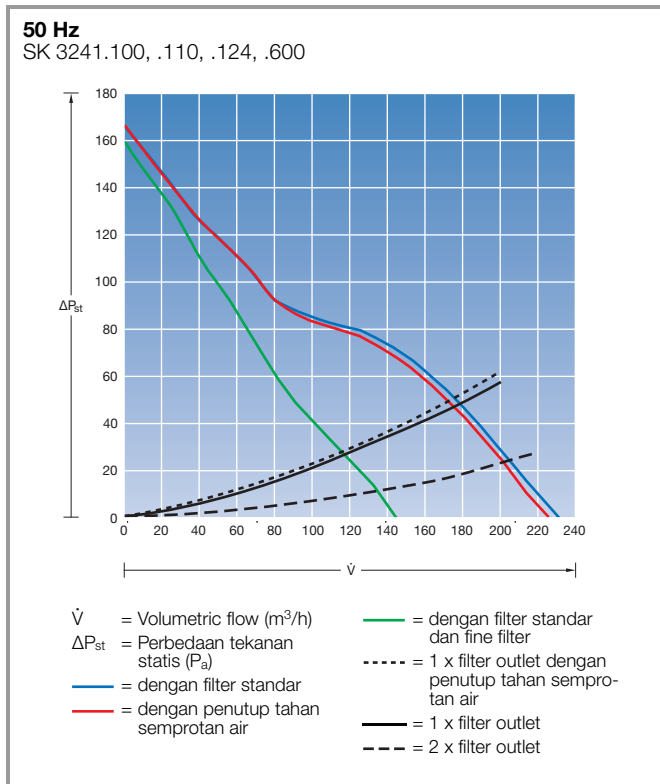
Output udara 180/160 m³/h



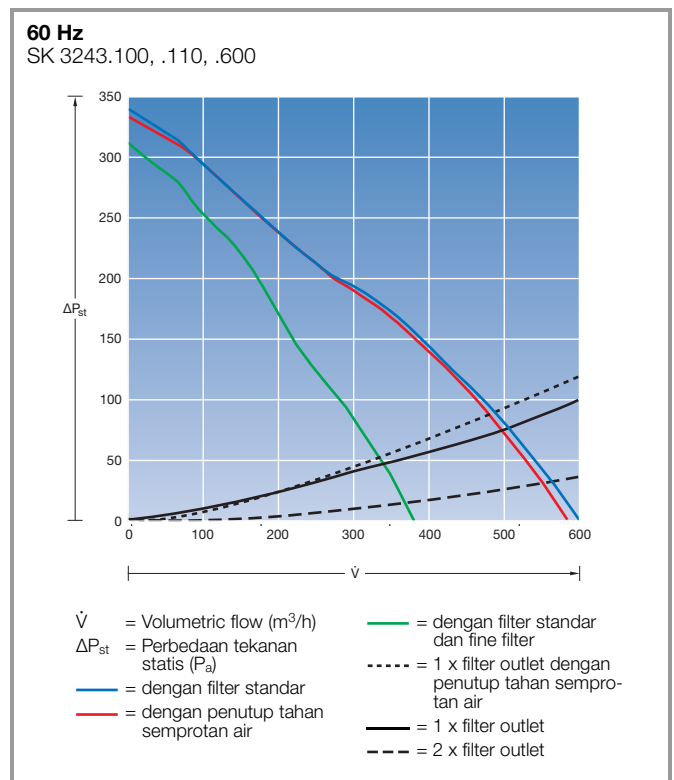
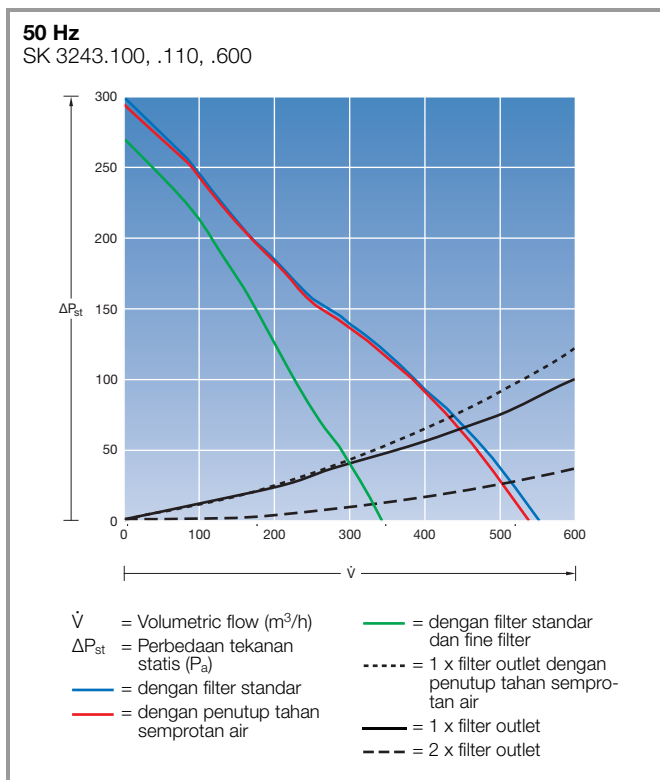
Pendinginan udara

Kipas filter TopTherm dan kipas filter TopTherm EMC

Output udara 230/250 m³/h

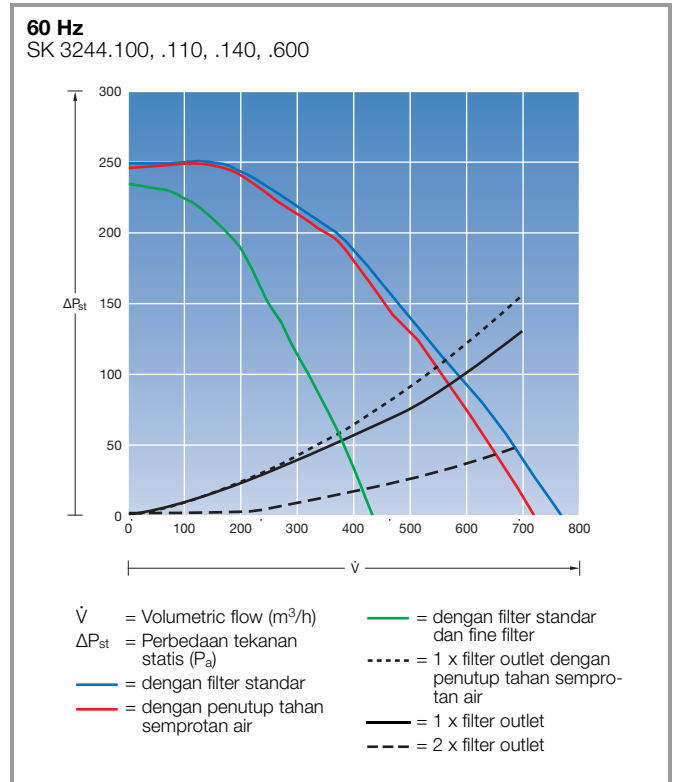
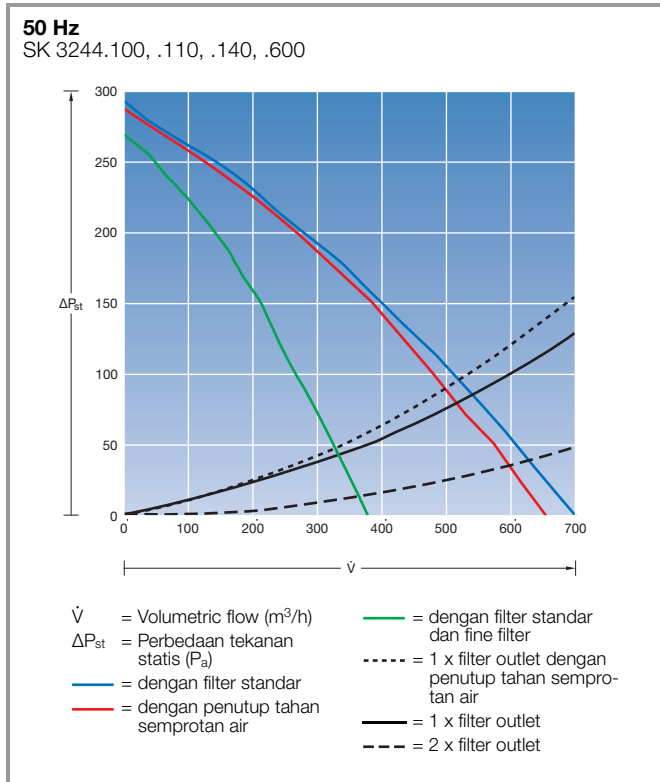


Output udara 550/600 m³/h

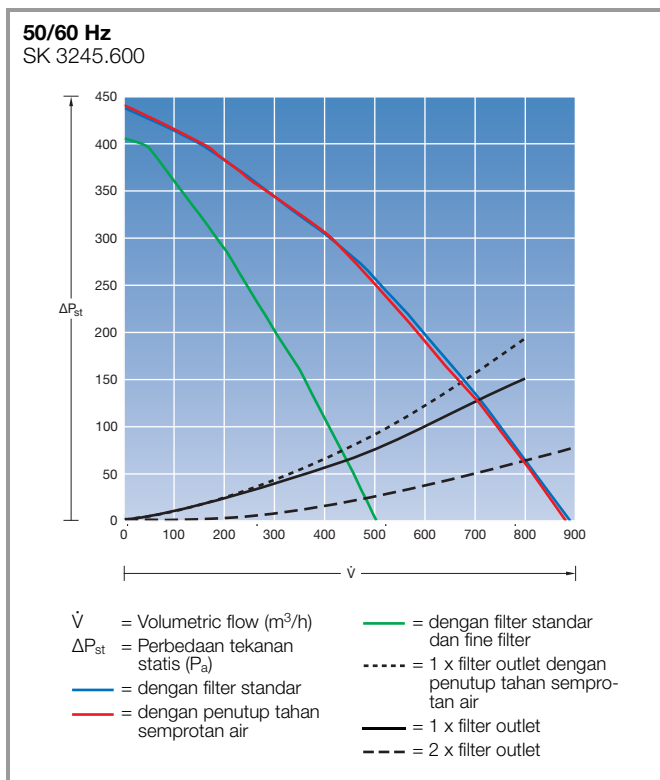


Kipas filter TopTherm dan kipas filter TopTherm EMC

Output udara 700/770 m³/h



Output udara 900 m³/h

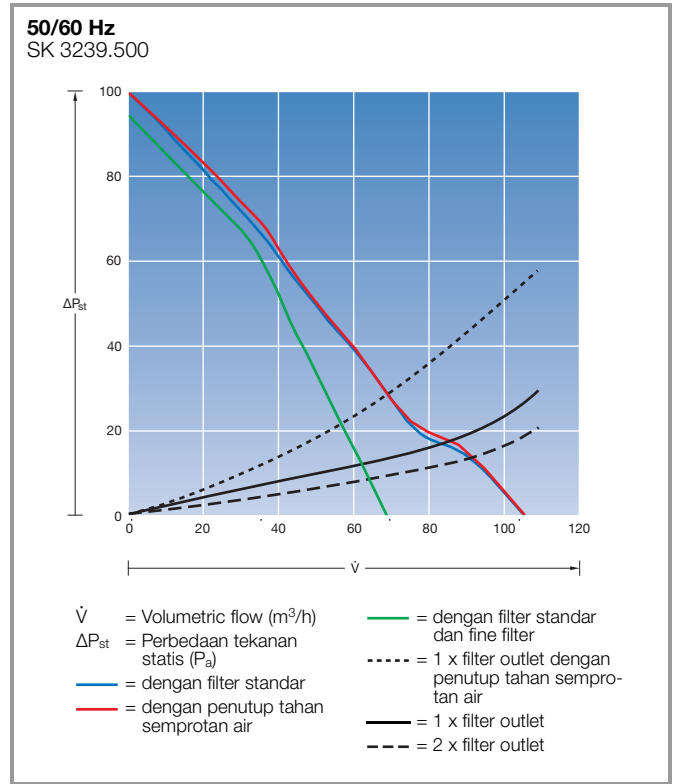
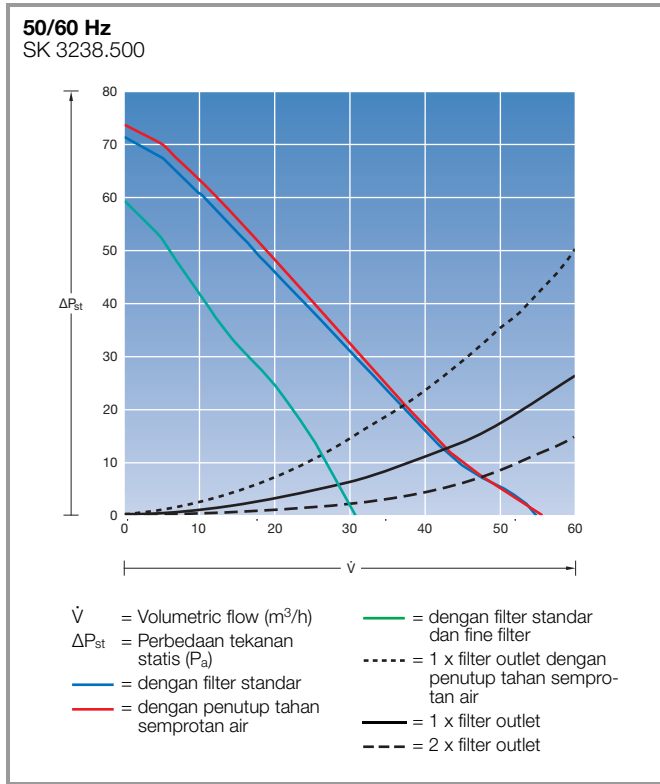


Pendinginan udara

Kipas filter TopTherm dengan teknologi EC

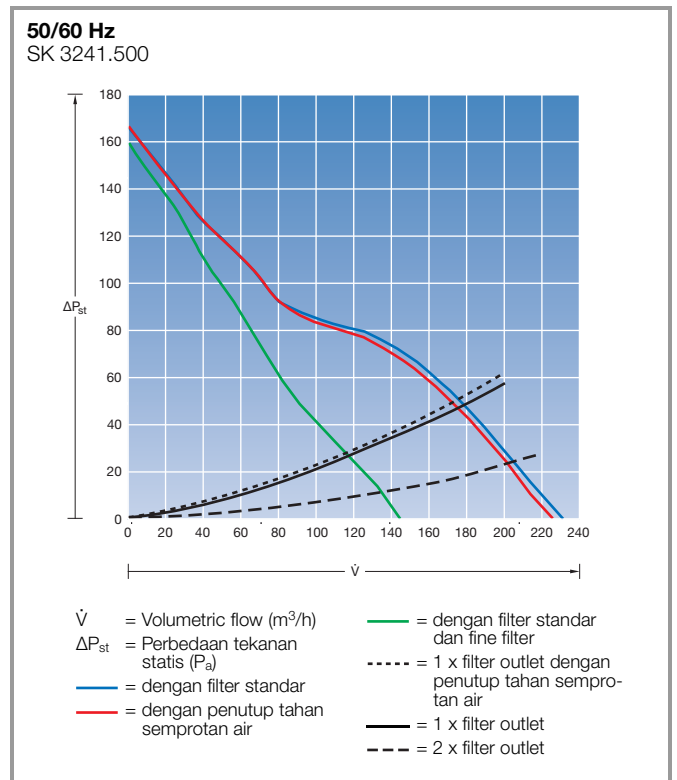
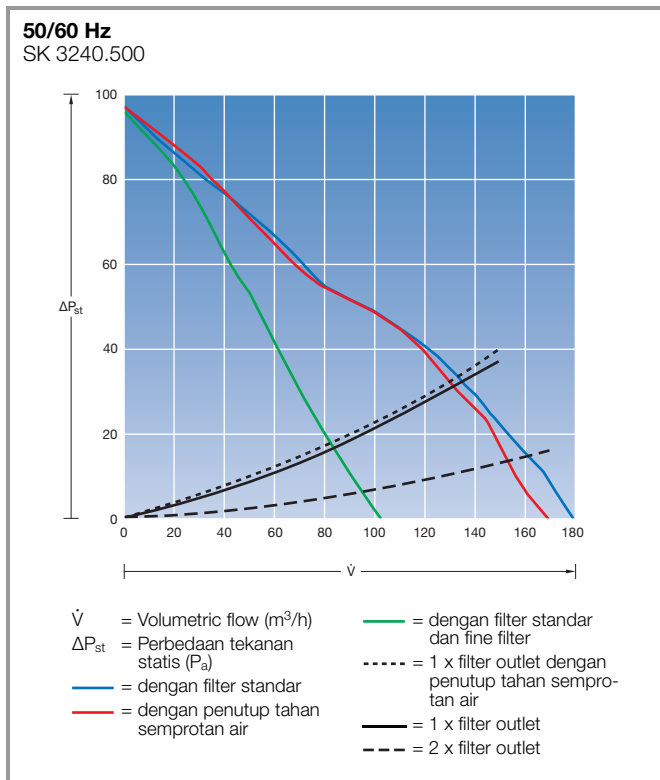
Output udara 55 m³/h

Output udara 105 m³/h



Output udara 180 m³/h

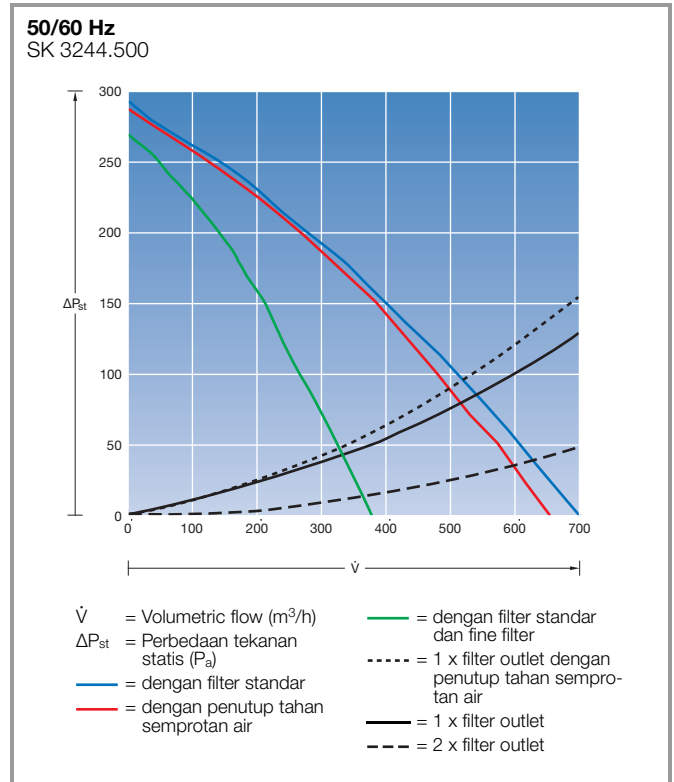
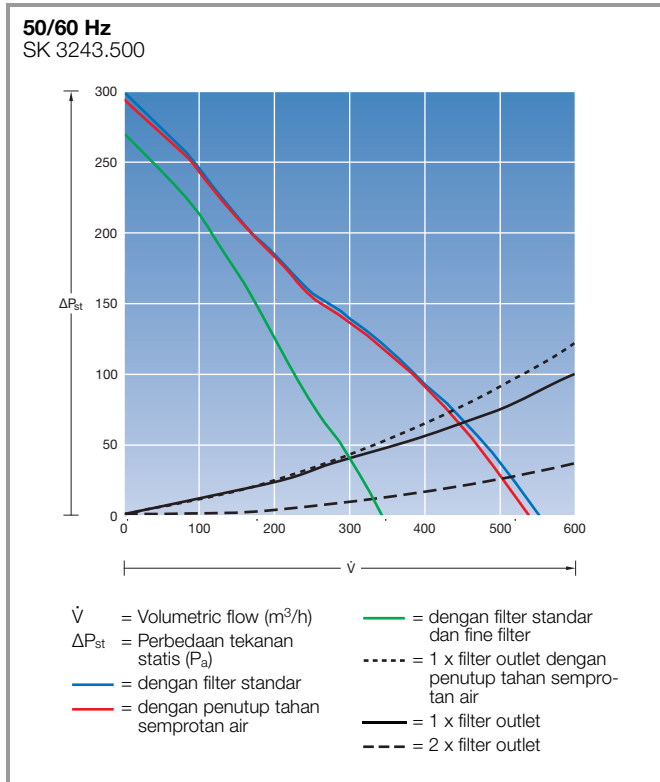
Output udara 230 m³/h



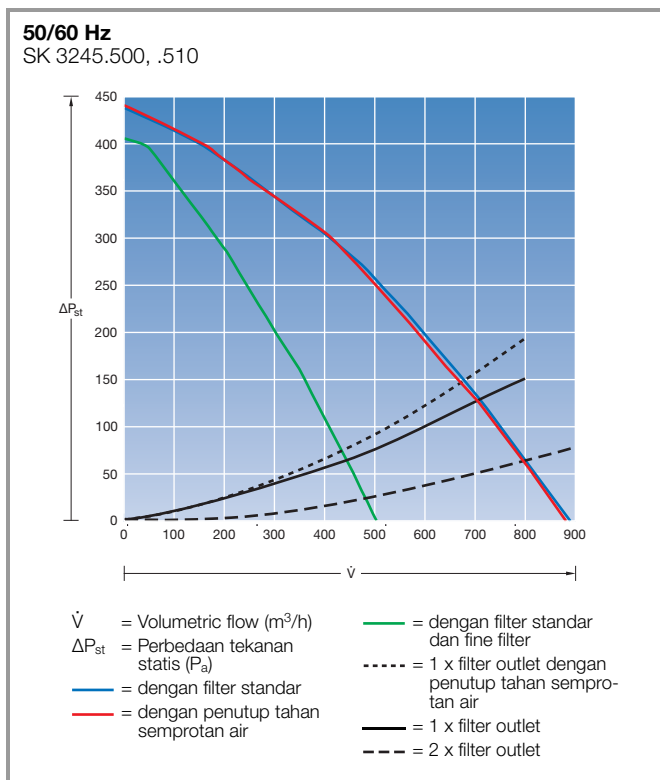
Kipas filter TopTherm dengan teknologi EC

Output udara 550 m³/h

Output udara 700 m³/h



Output udara 900 m³/h

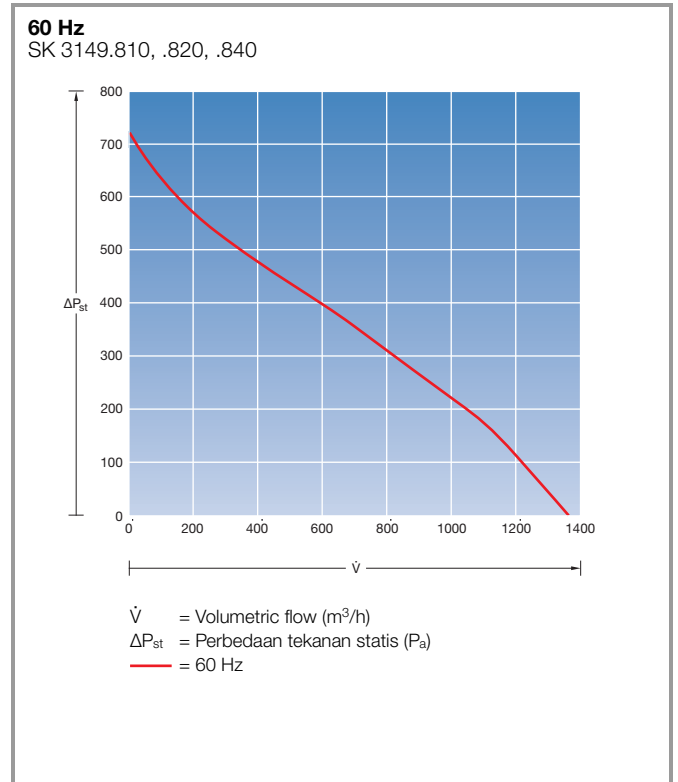
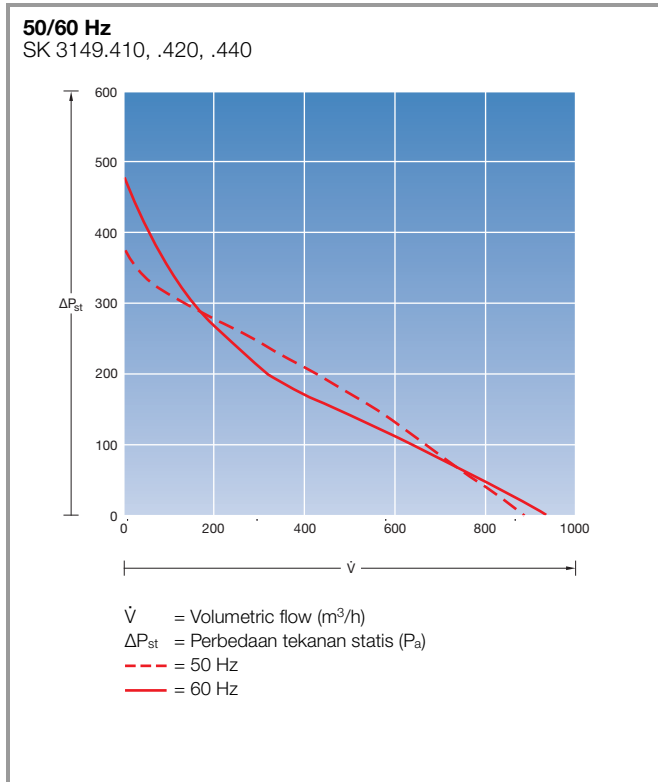


Pendinginan udara

Kipas atap TopTherm

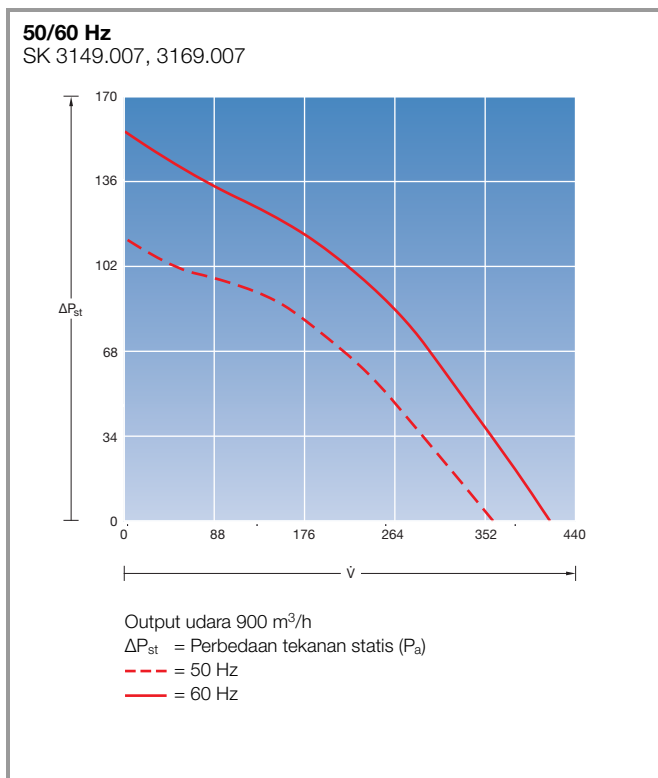
Output udara 400 m³/h

Output udara 800 m³/h



Kipas atap, ventilasi atap

Output udara 360 m³/h

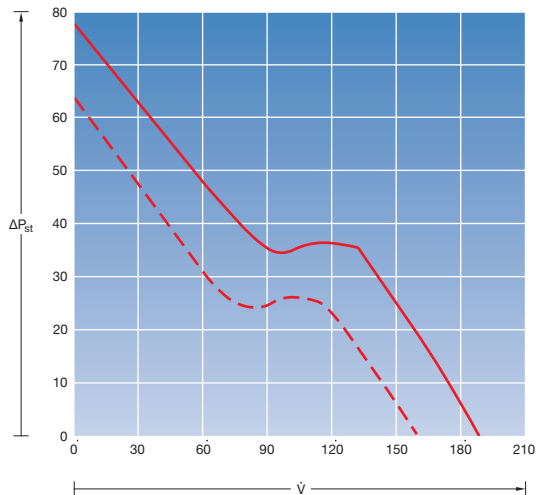


Kipas rak untuk 482,6 mm (19")

Output udara 320/480 m³/h

50/60 Hz

SK 3340.230, 3350.230, 3341.115, .230, 3342.024, .230, .500, 3351.230, 3352.230, .500



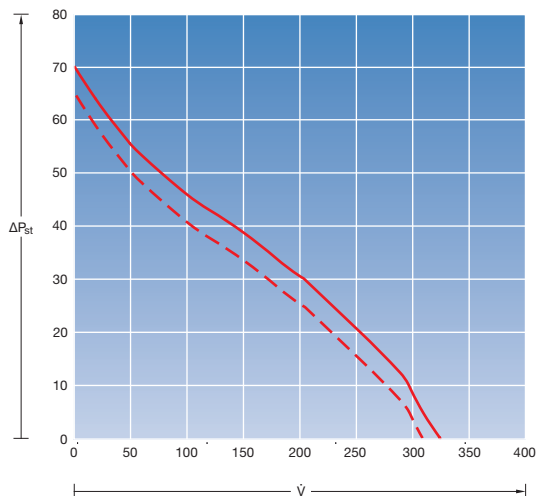
V̇ = Volumetric flow (m³/h)
 ΔP_{st} = Perbedaan tekanan statis (Pa)
 --- = 50 Hz
 --- = 60 Hz

Kipas blower untuk 482.6 mm (19")

Output udara 320 m³/h

50/60 Hz

SK 3144.000, 3145.000

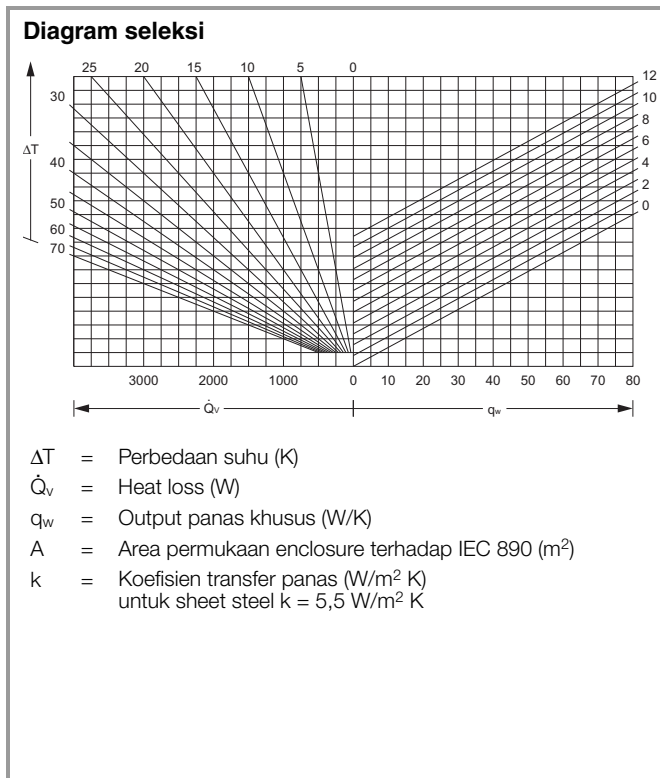
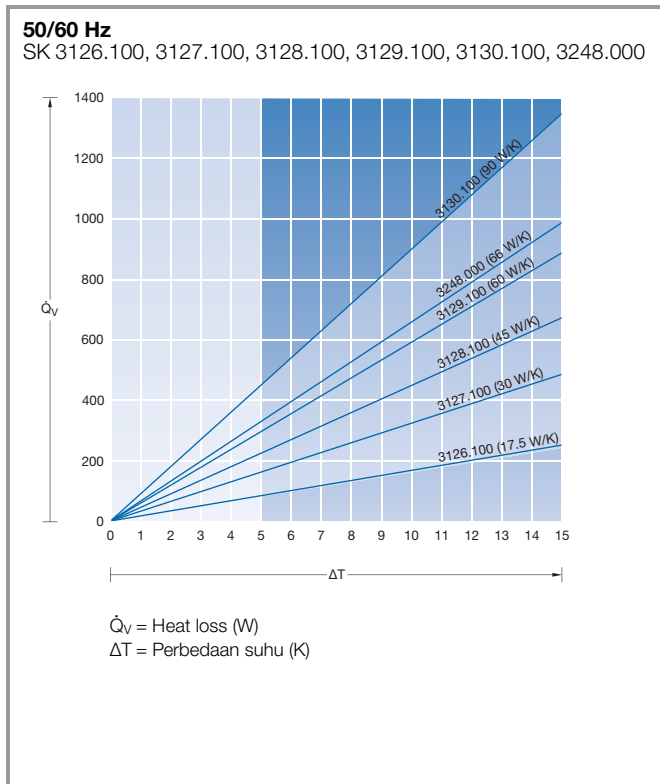


V̇ = Volumetric flow (m³/h)
 ΔP_{st} = Perbedaan tekanan statis (Pa)
 --- = 50 Hz
 --- = 60 Hz

Pendinginan udara

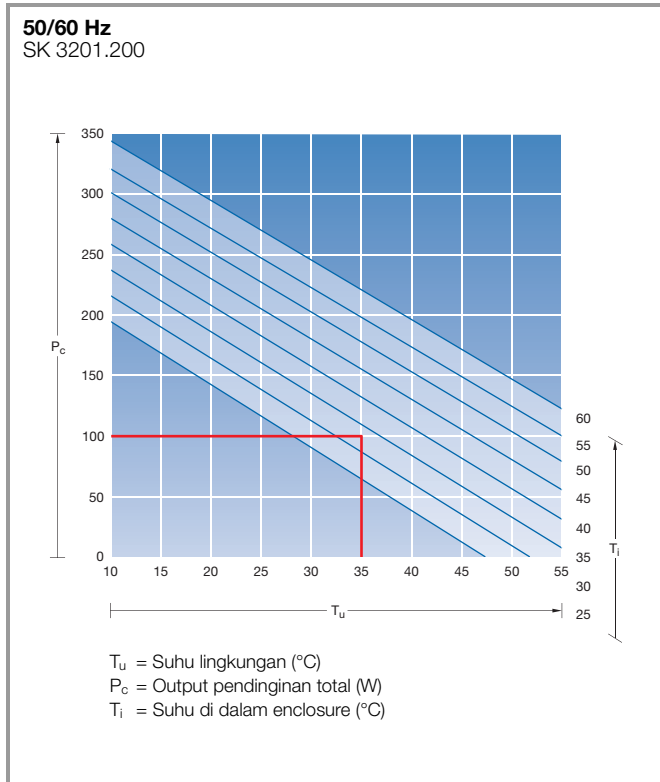
Exchanger udara/udara-panas TopTherm

Output panas khusus 17,5 – 90 W/K, terpasang pada dinding dengan pengontrol

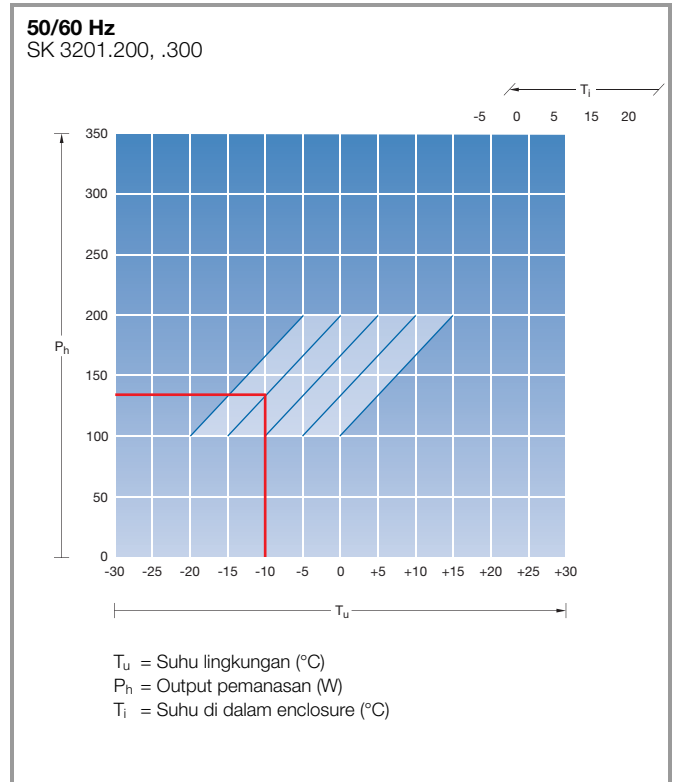


Cooler termoelektrik

Output pendinginan

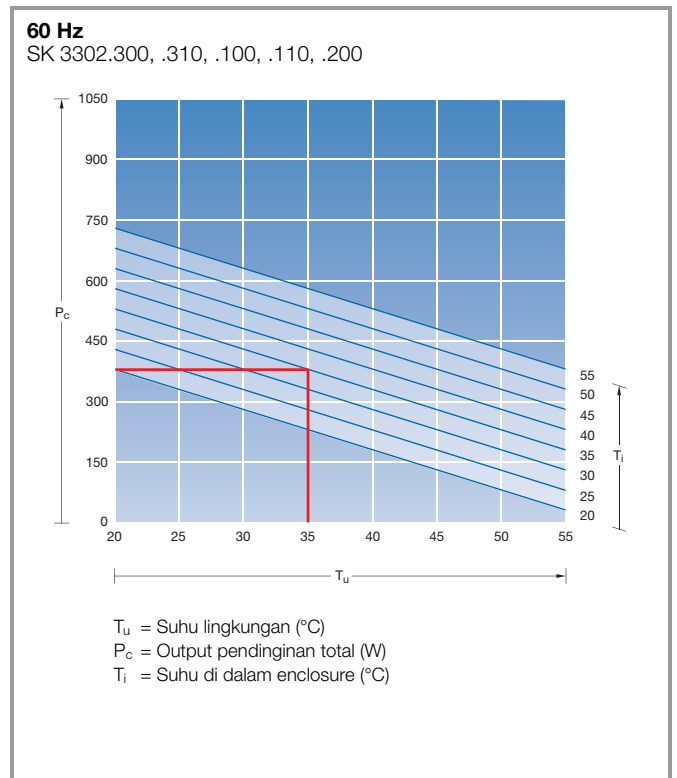
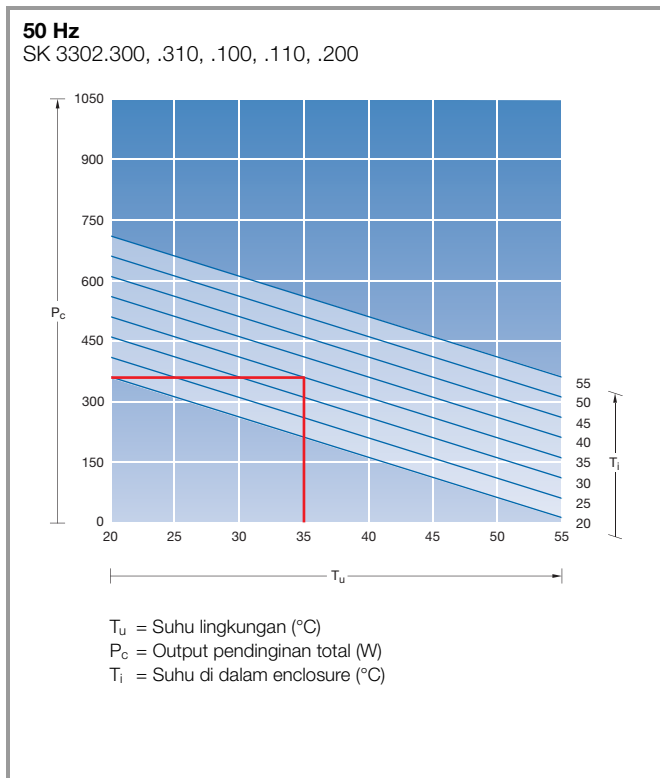


Output pemanasan



Perangkat pendingin terpasang pada dinding TopTherm

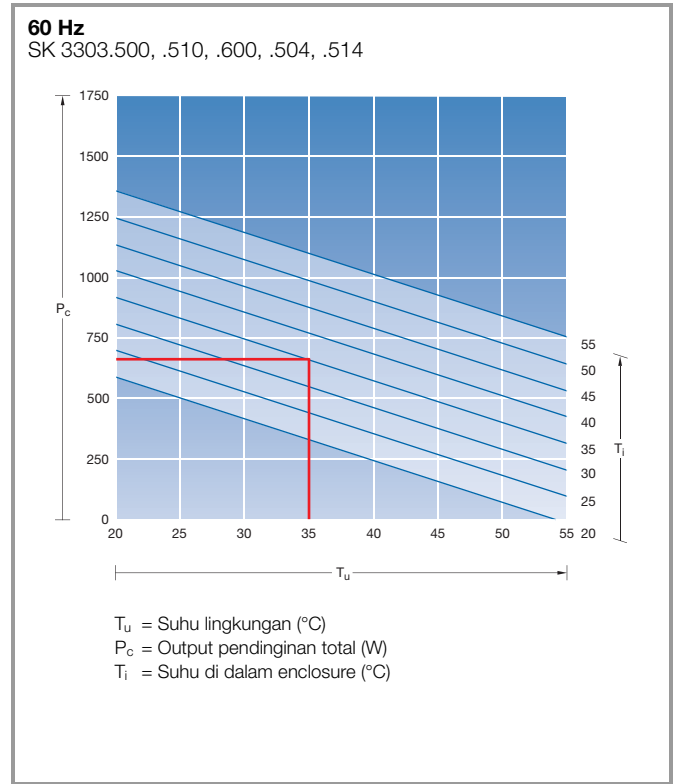
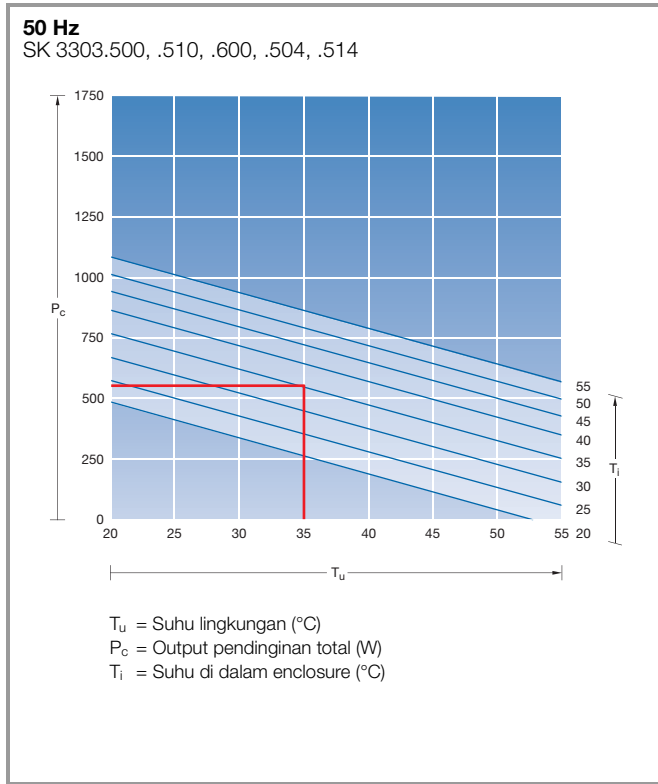
Kelas output 300 W (115/230 V, 1~)



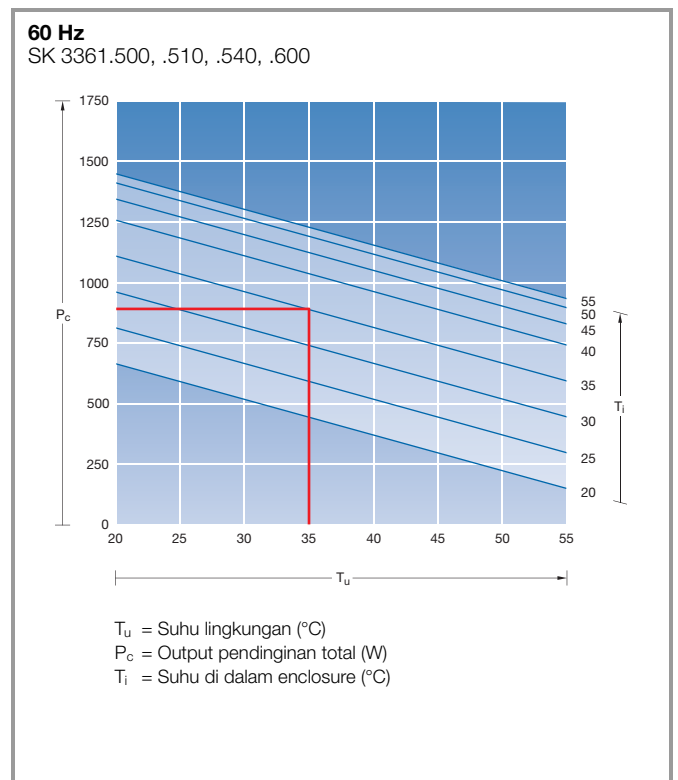
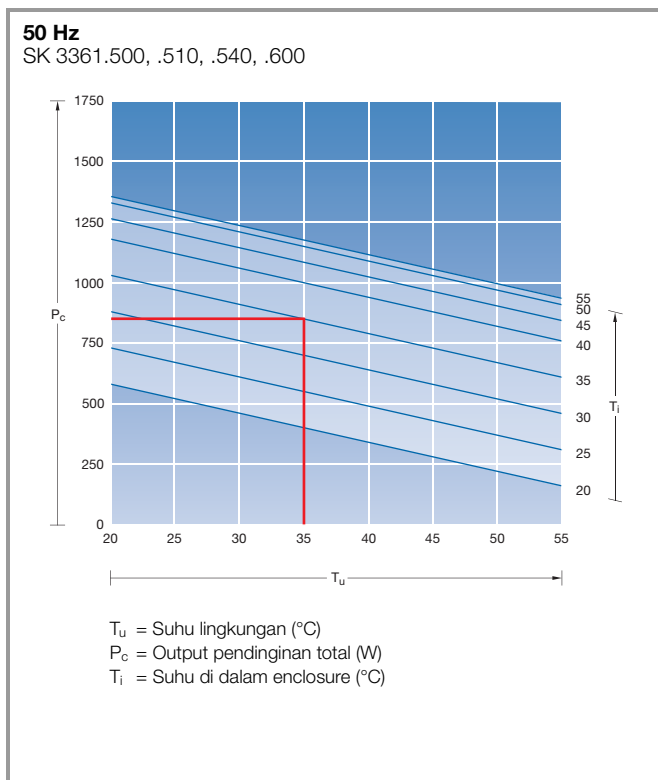
Perangkat pendingin

Perangkat pendingin terpasang pada dinding TopTherm Blue e

Kelas output 500 W (115/230 V, 1~)

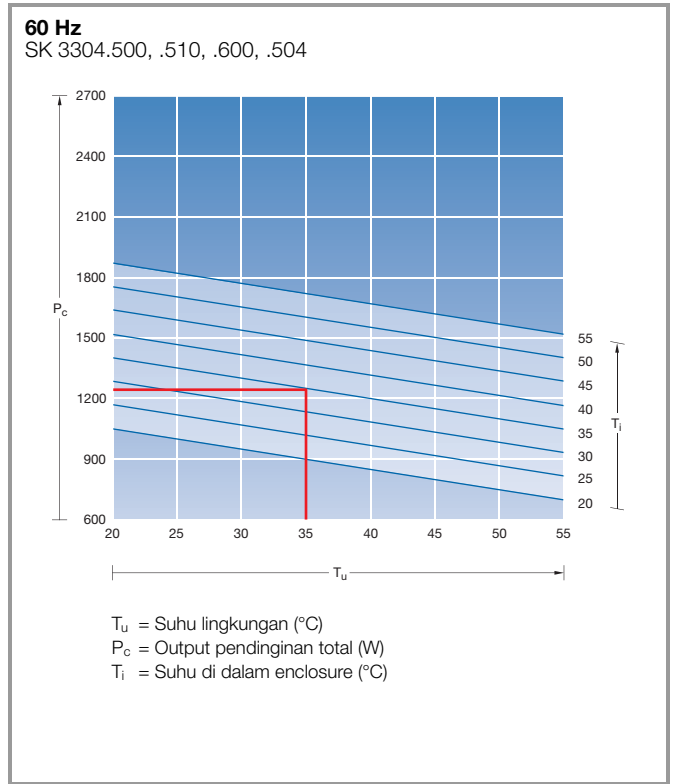
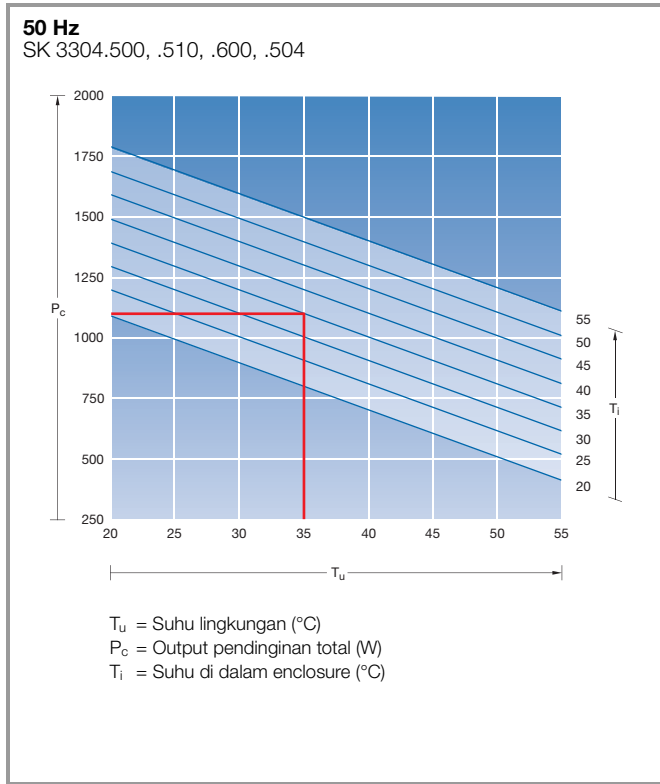


Kelas output 750 W (115/230 V, 1~, 400 V, 2~)

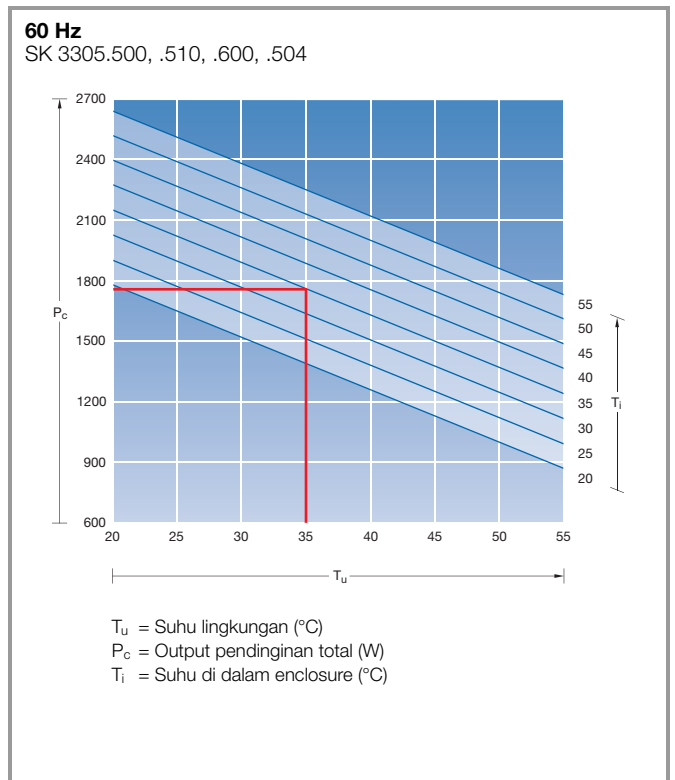
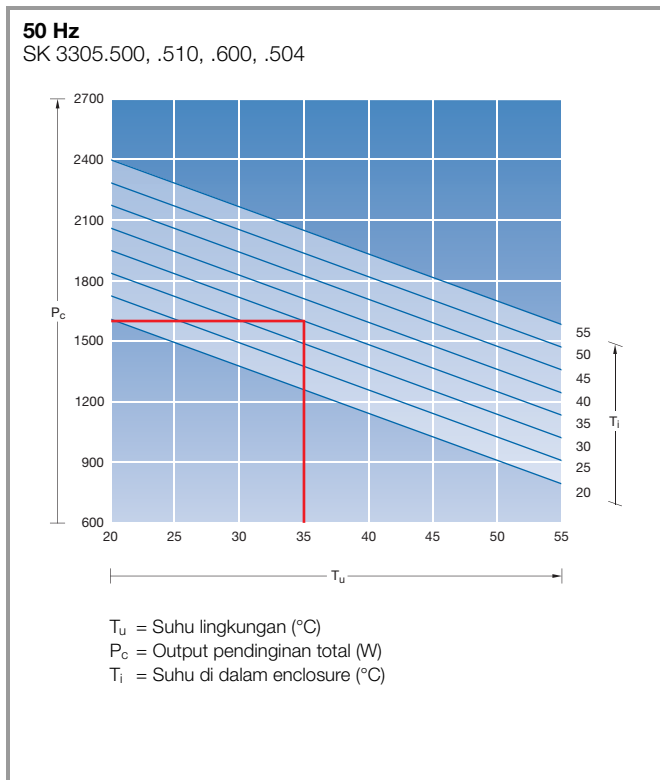


Perangkat pendingin terpasang pada dinding TopTherm Blue e

Kelas output 1000 W (115/230 V, 1~)



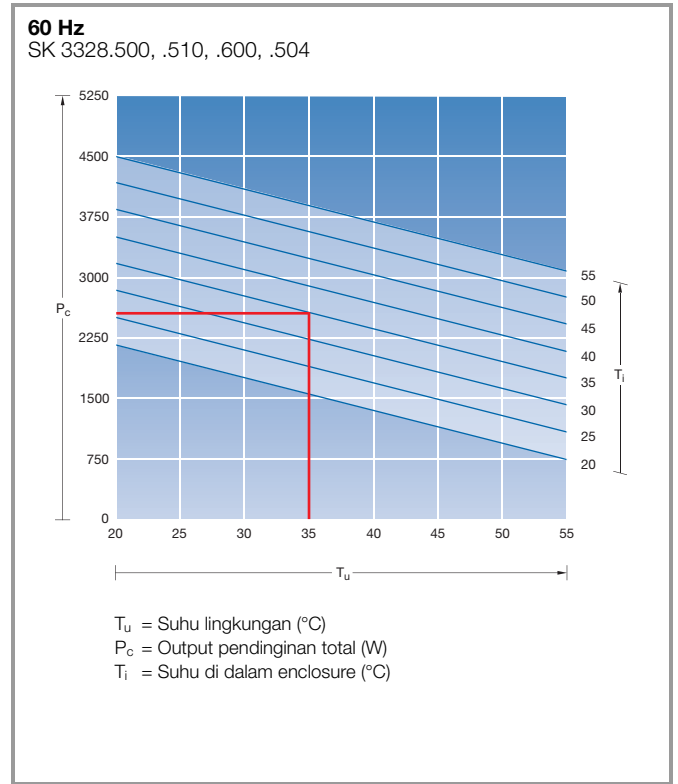
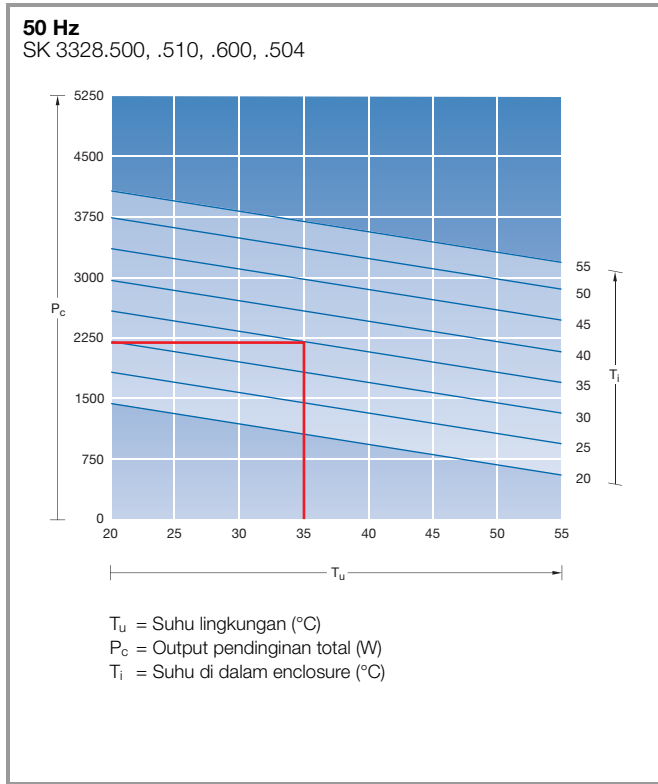
Kelas output 1500 W (115/230 V, 1~)



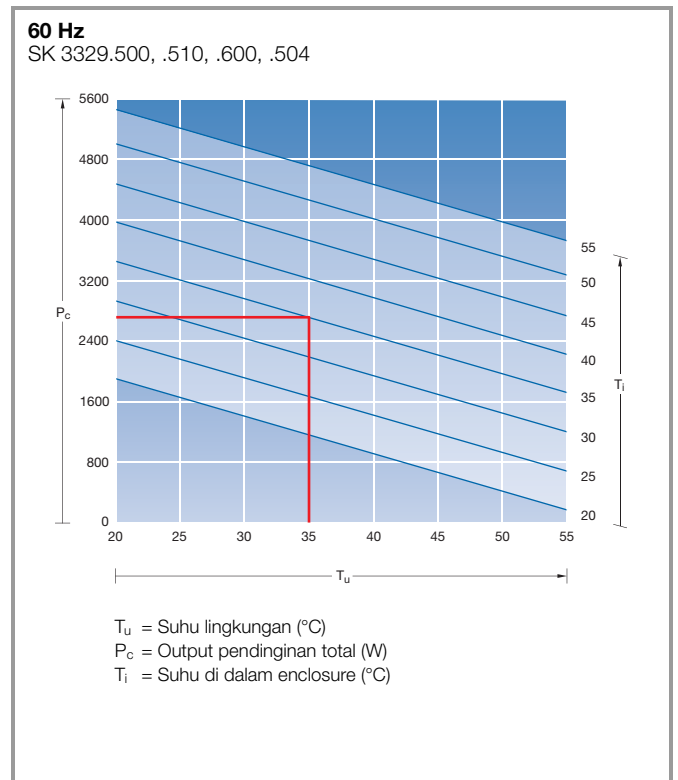
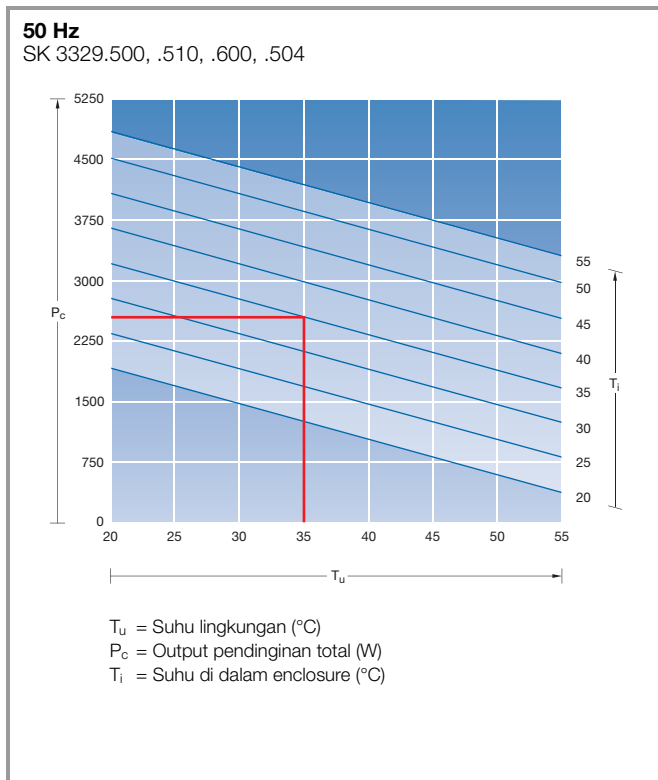
Perangkat pendingin

Perangkat pendingin terpasang pada dinding TopTherm Blue e

Kelas output 2000 W (115/230 V, 1~)

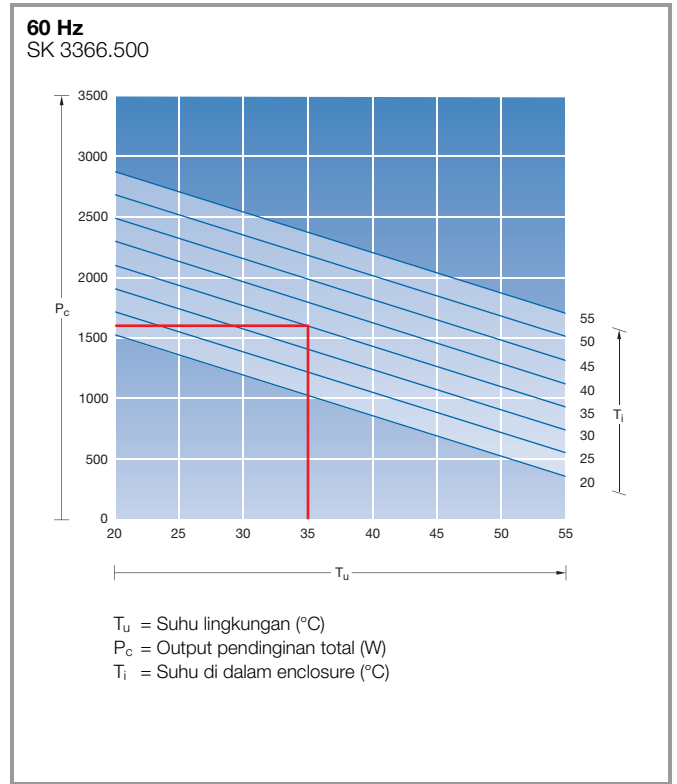
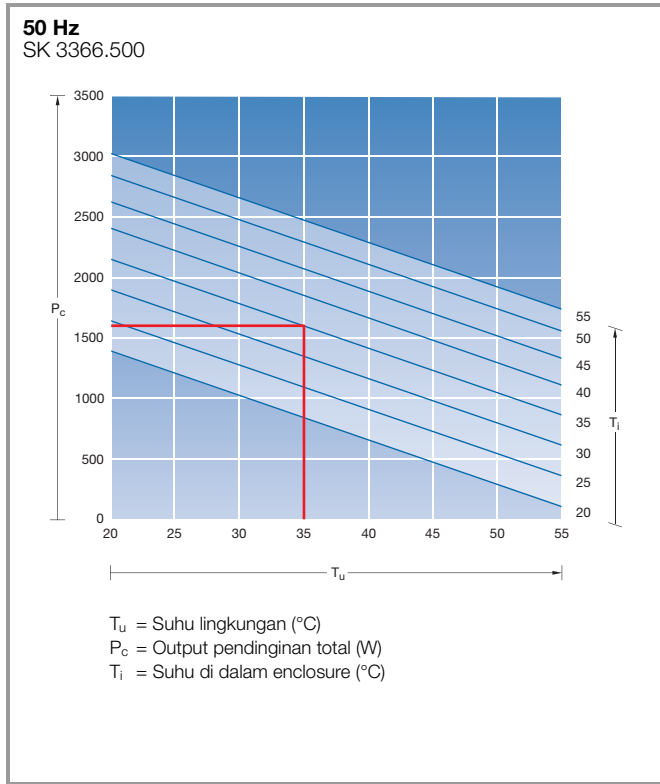


Kelas output 2500 W (115/230 V, 1~)

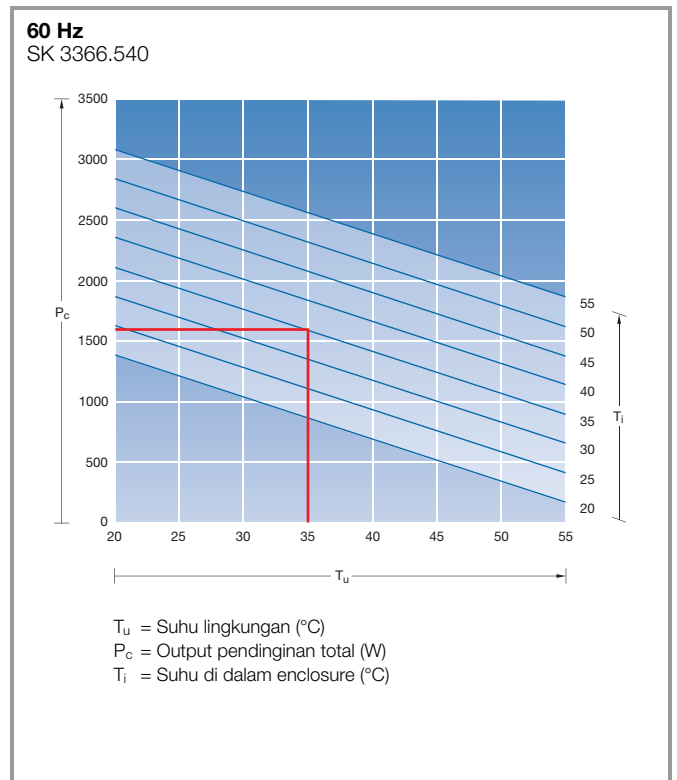
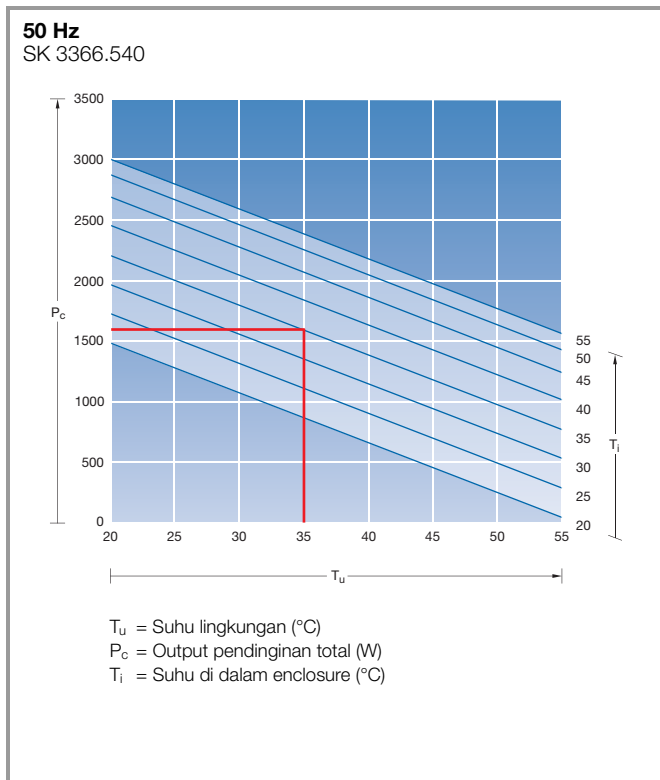


Perangkat pendingin terpasang pada dinding TopTherm Blue e, slimline

Kelas output 1500 W (230 V, 1~)



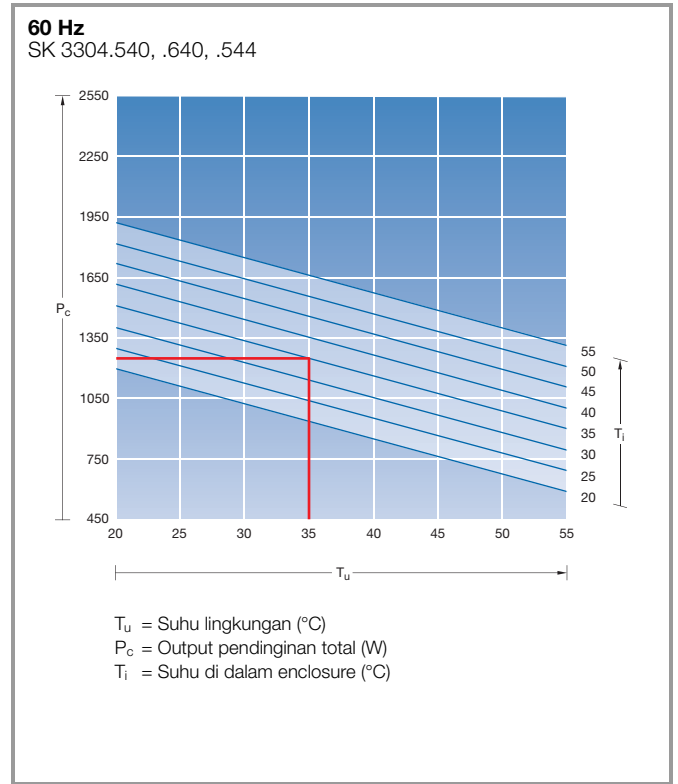
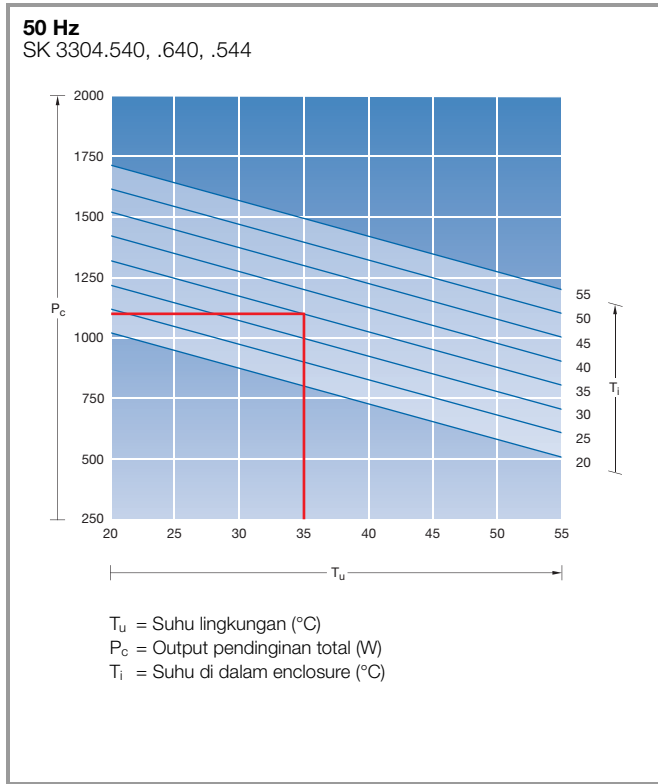
Kelas output 1500 W (400/460 V, 3~)



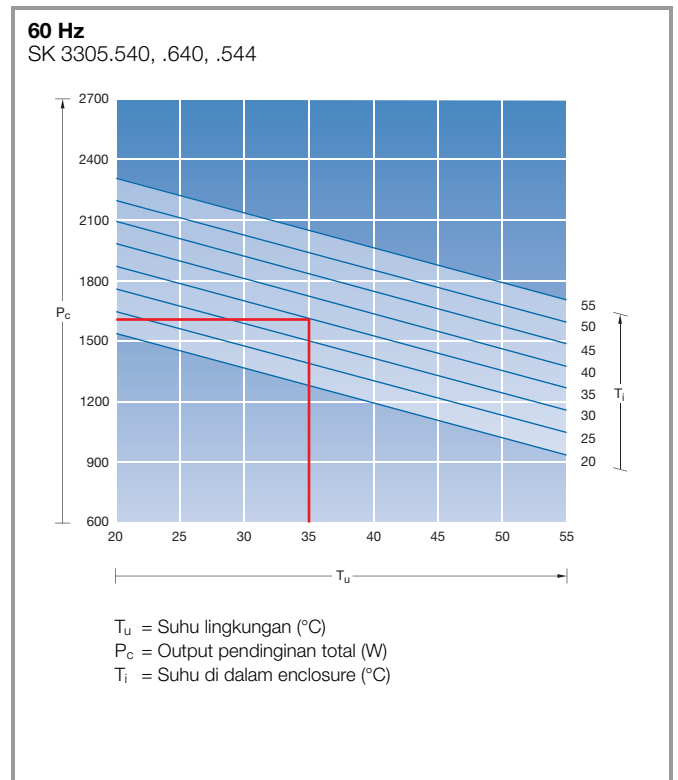
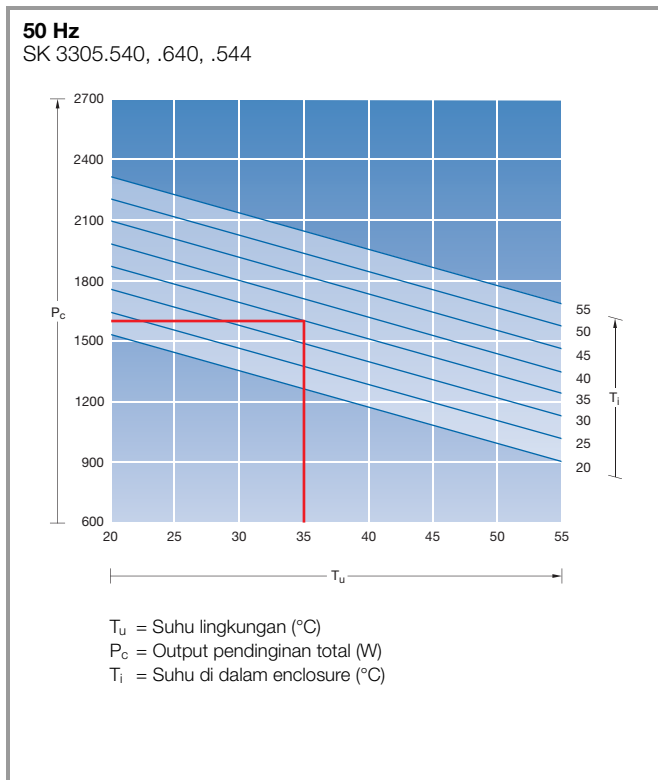
Perangkat pendingin

Perangkat pendingin terpasang pada dinding TopTherm Blue e

Kelas output 1000 W (400/460 V, 3~)

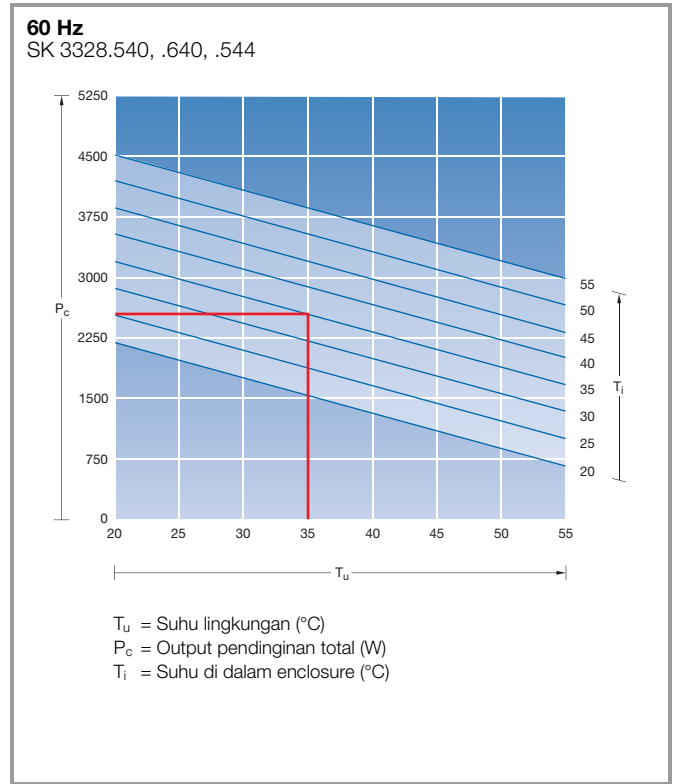
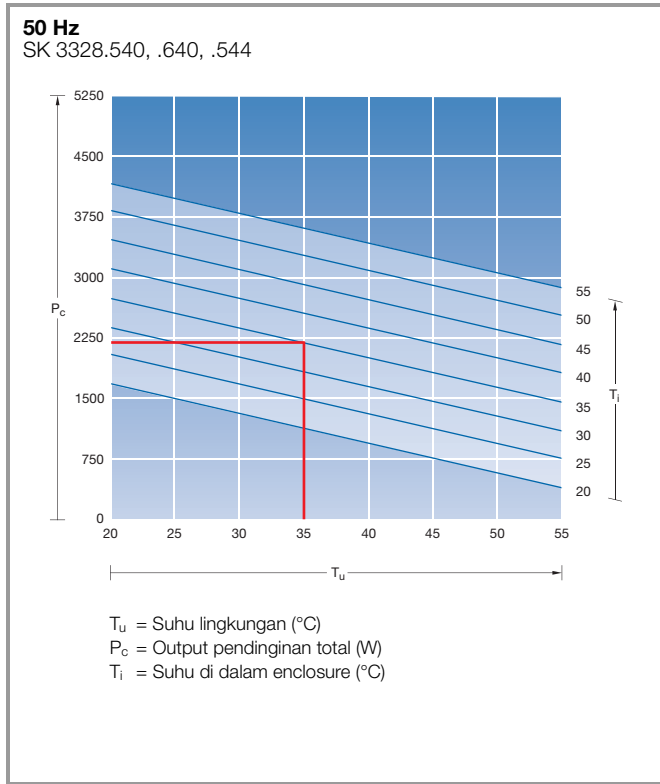


Kelas output 1500 W (400/460 V, 3~)

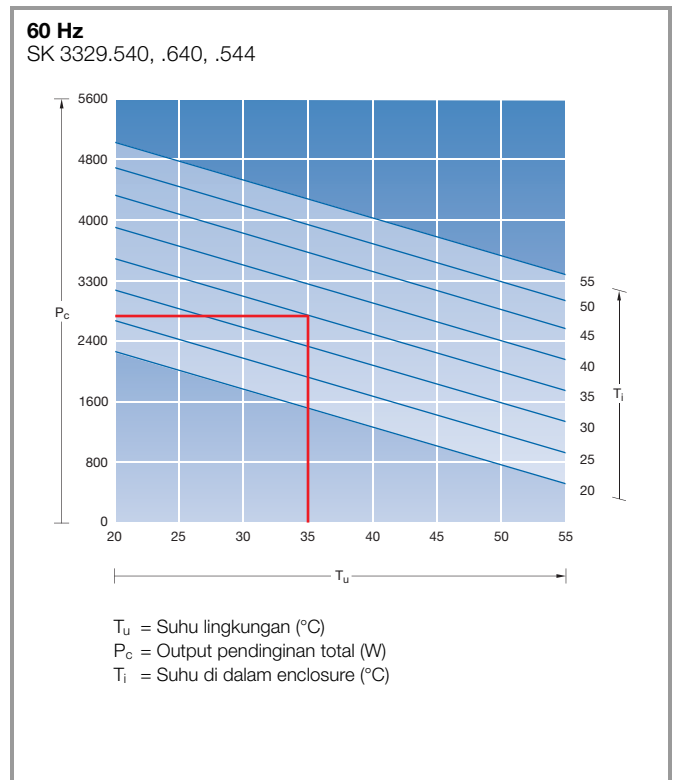
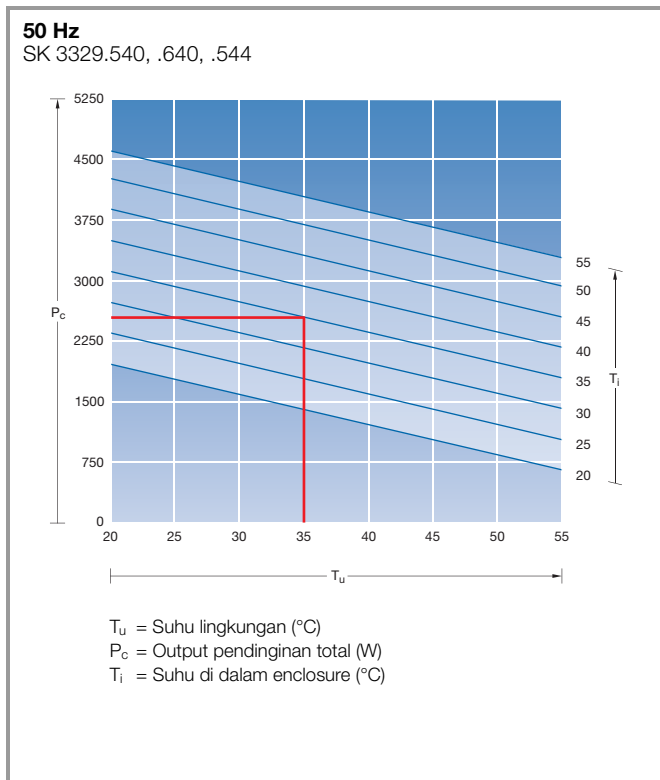


Perangkat pendingin terpasang pada dinding TopTherm Blue e

Kelas output 2000 W (400/460 V, 3~)



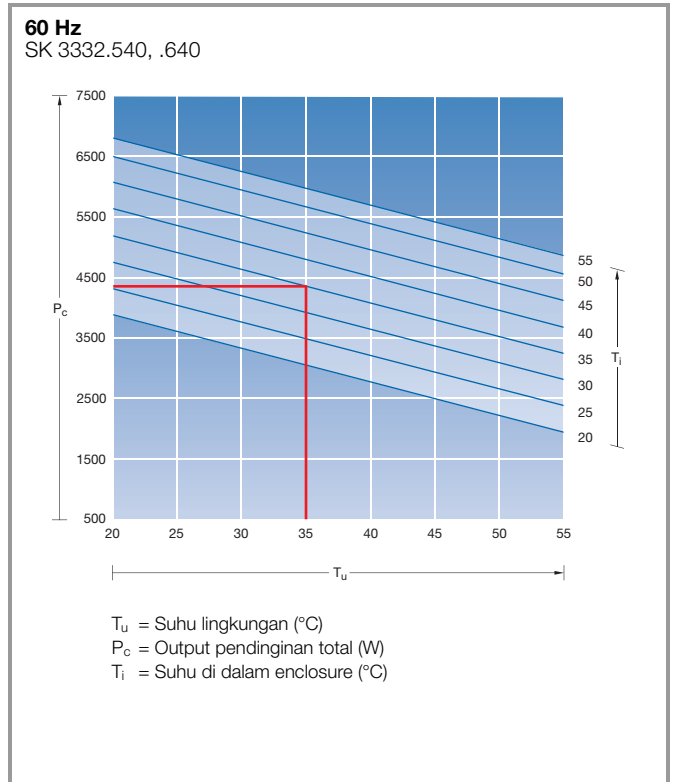
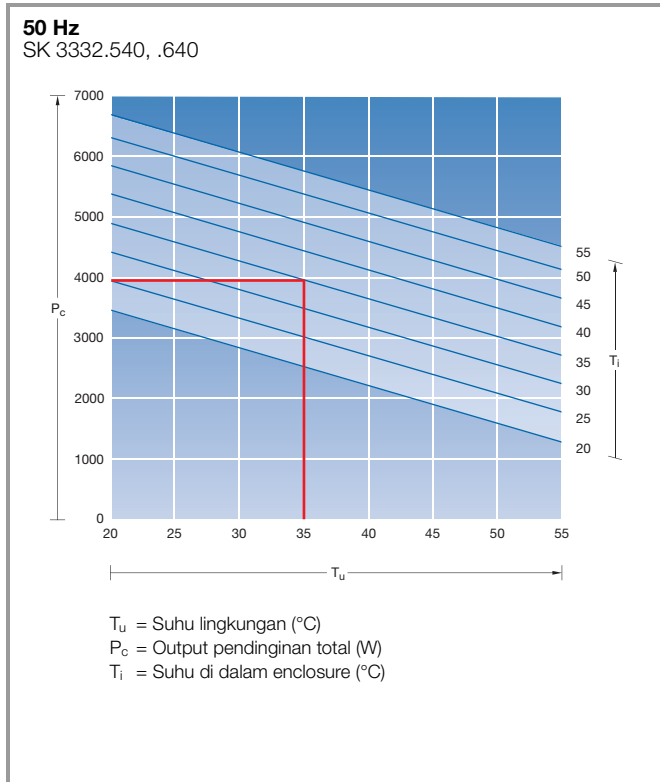
Kelas output 2500 W (400/460 V, 3~)



Perangkat pendingin

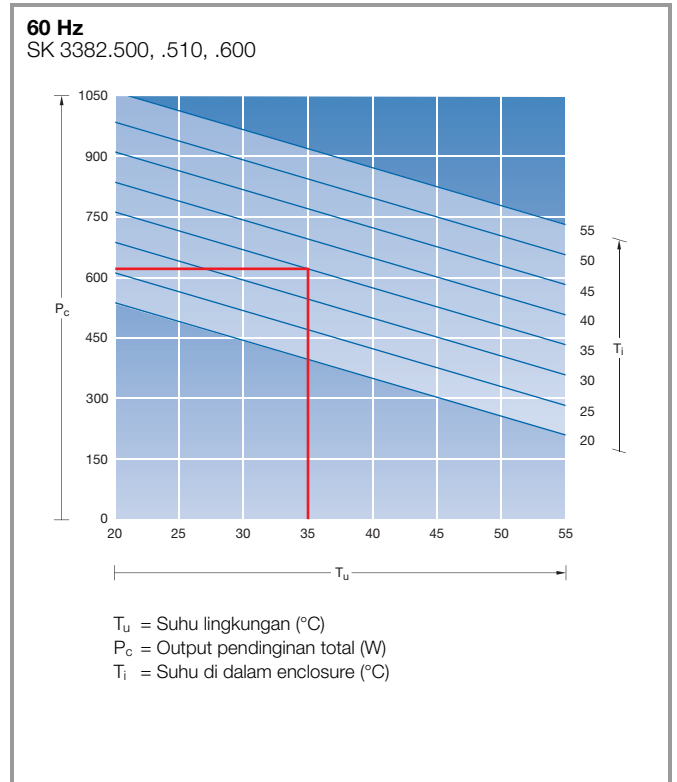
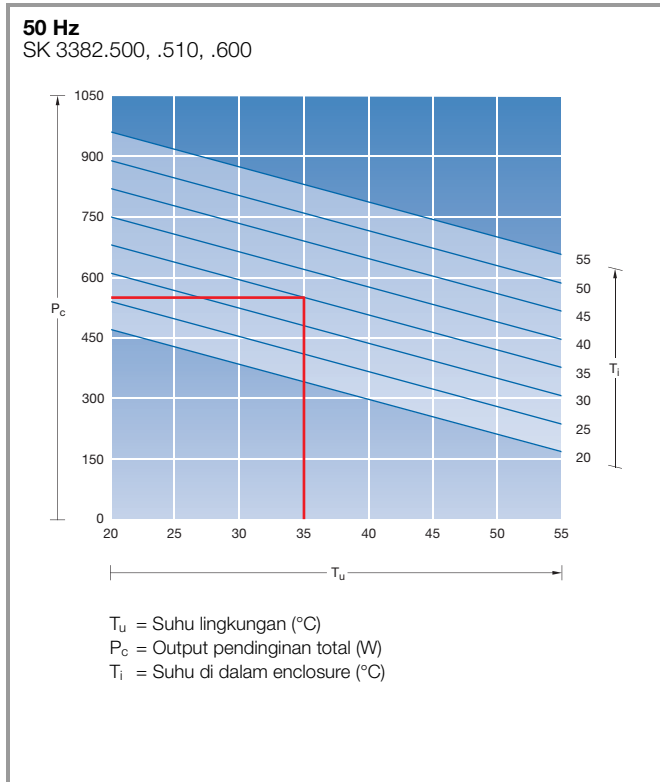
Perangkat pendingin terpasang pada dinding TopTherm Blue e

Kelas output 4000 W (400/460 V, 3~)

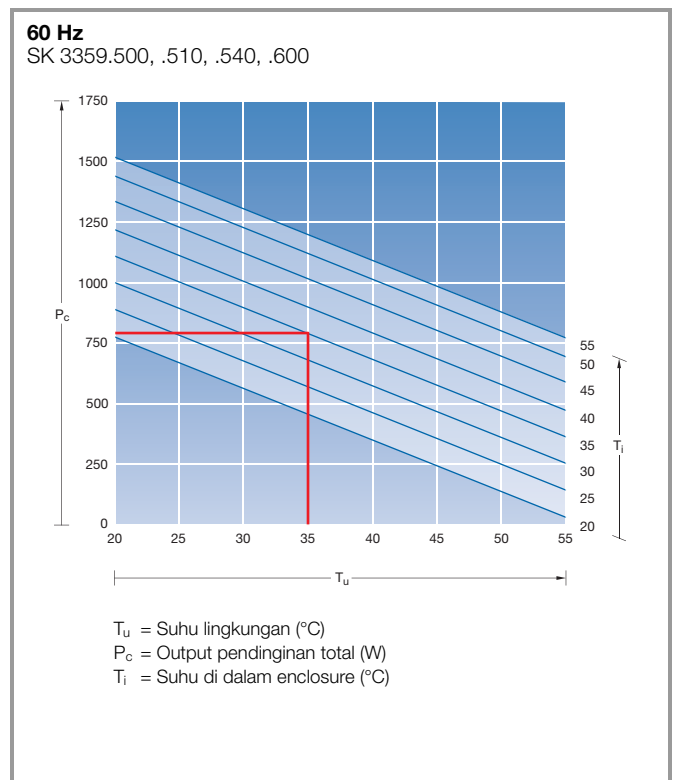
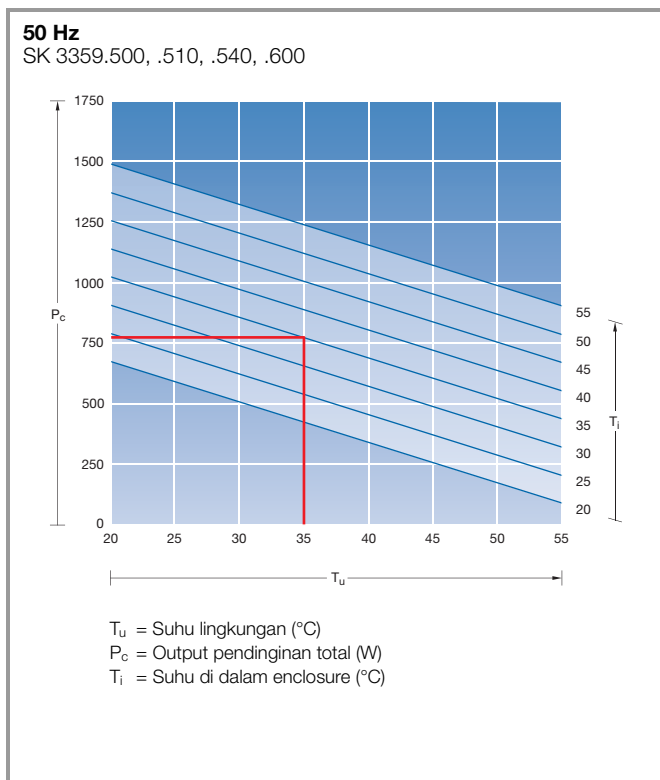


Perangkat pendingin terpasang pada atap TopTherm Blue e

Kelas output 500 W (115/230 V, 1~)



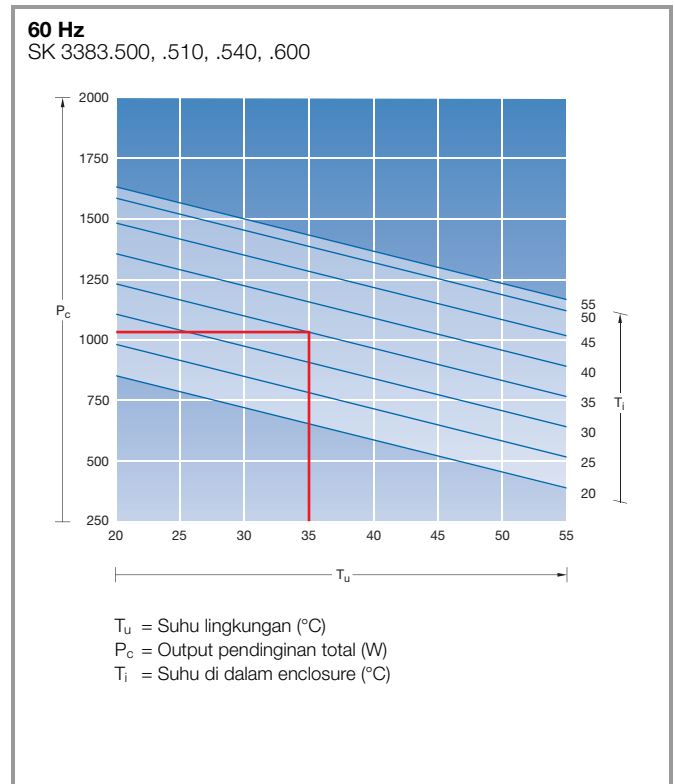
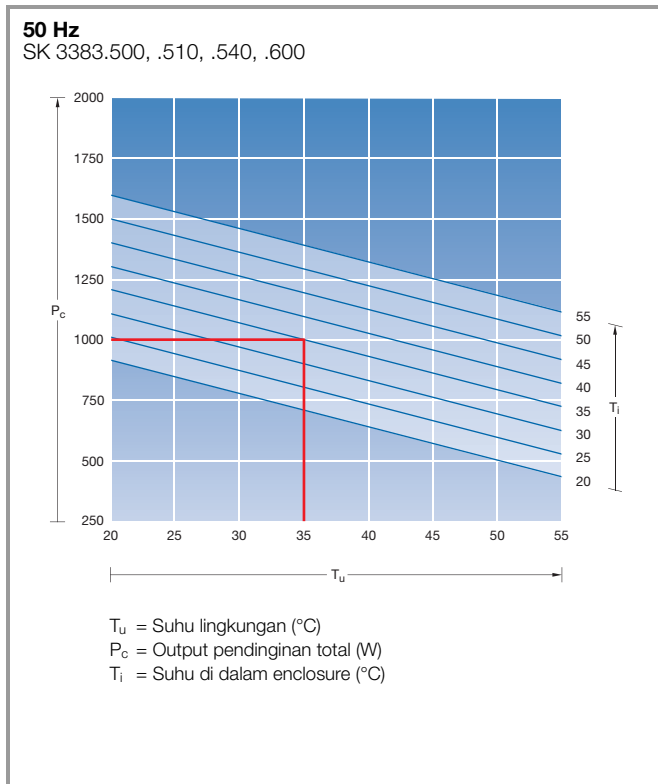
Kelas output 750 W (115/230 V, 1~, 400 V, 2~)



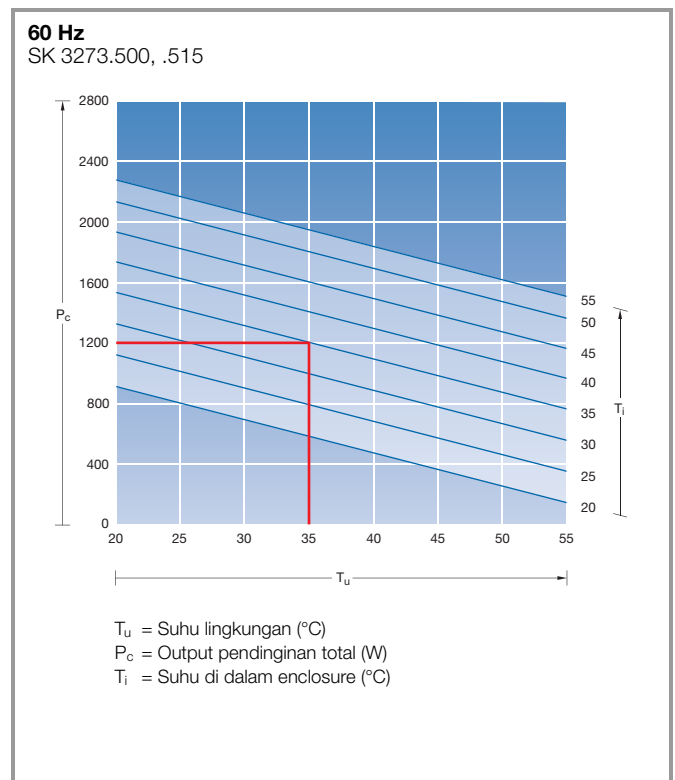
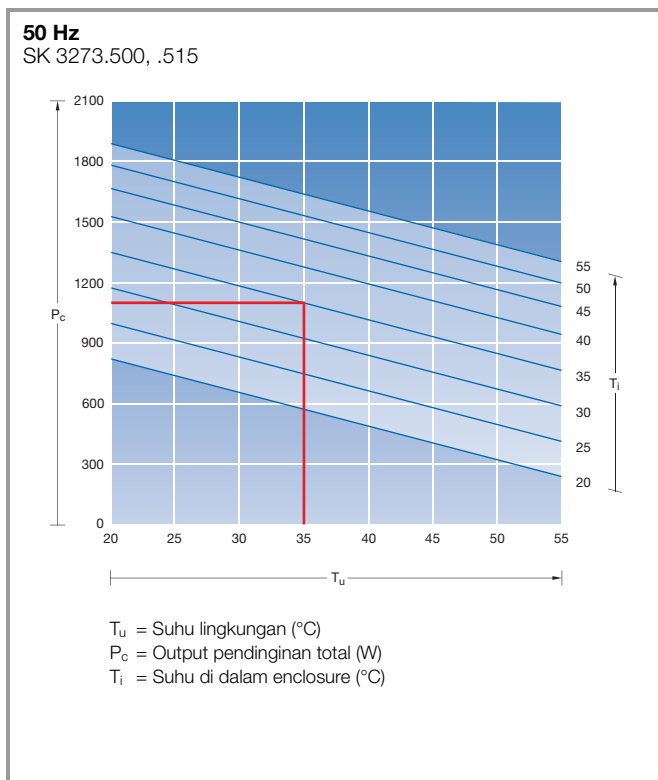
Perangkat pendingin

Perangkat pendingin terpasang pada atap TopTherm Blue e

Kelas output 1000 W (115/230 V, 1~, 400 V, 2~)

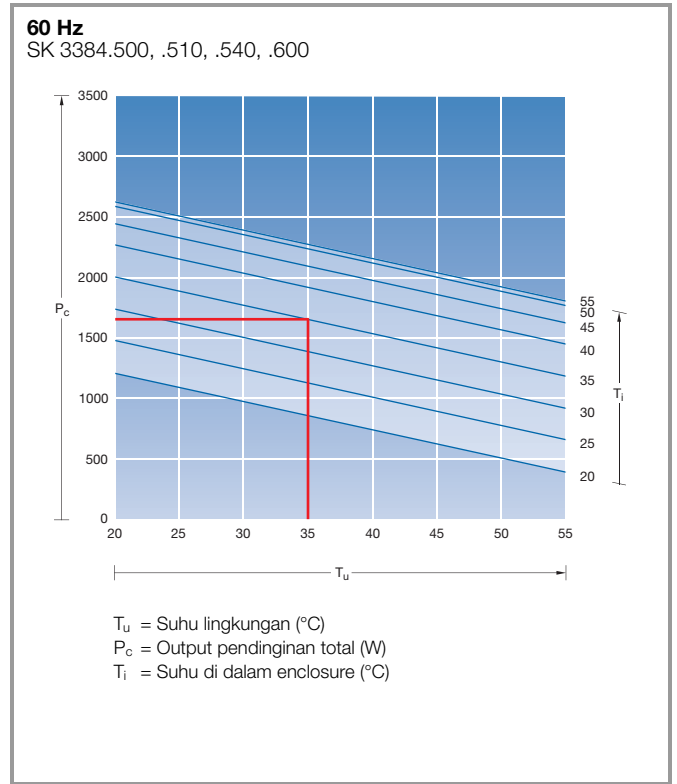
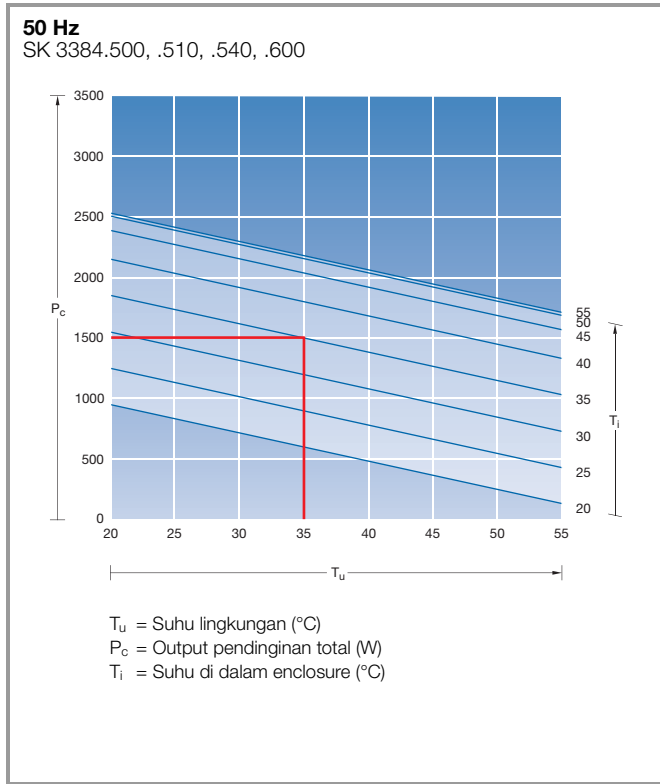


Kelas output 1100 W (115/230 V, 1~)

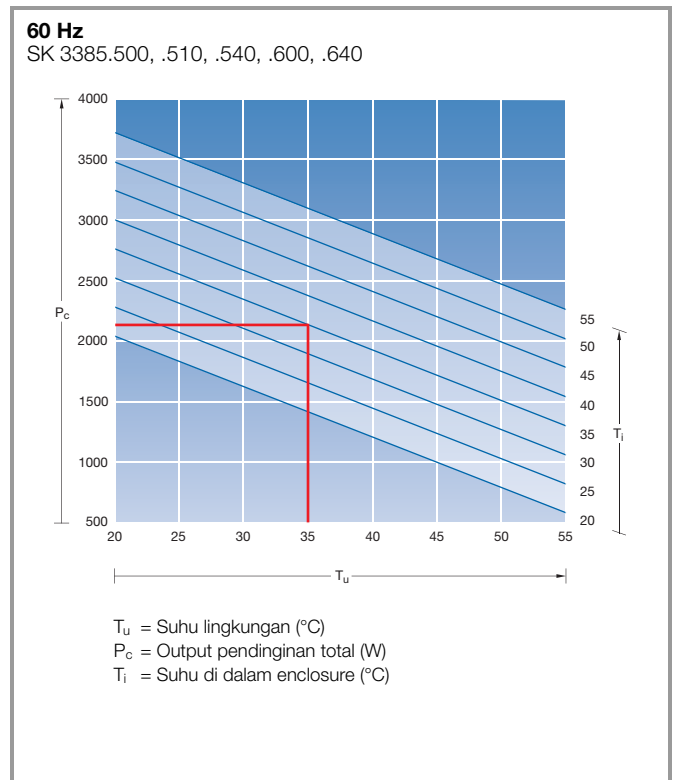
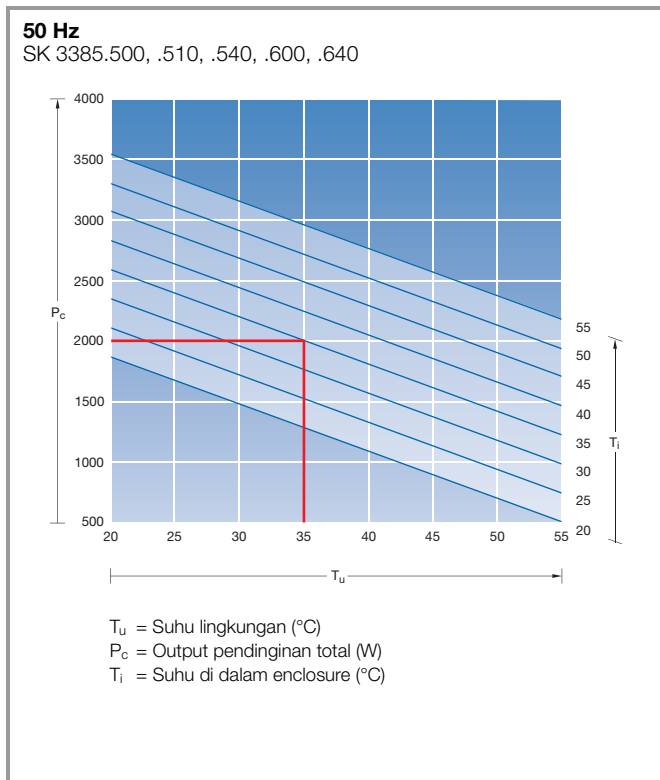


Perangkat pendingin terpasang pada atap TopTherm Blue e

Kelas output 1500 W (115/230 V, 1~, 400 V, 2~)



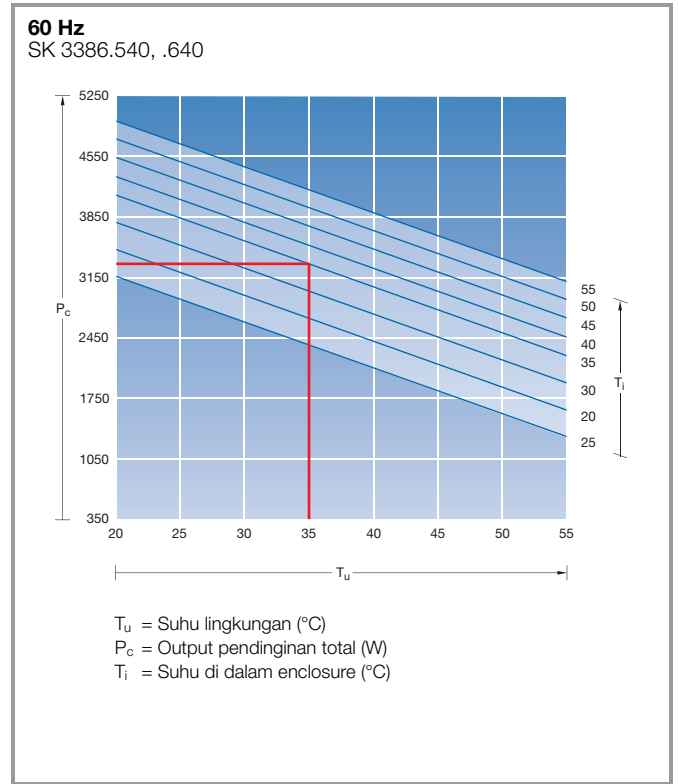
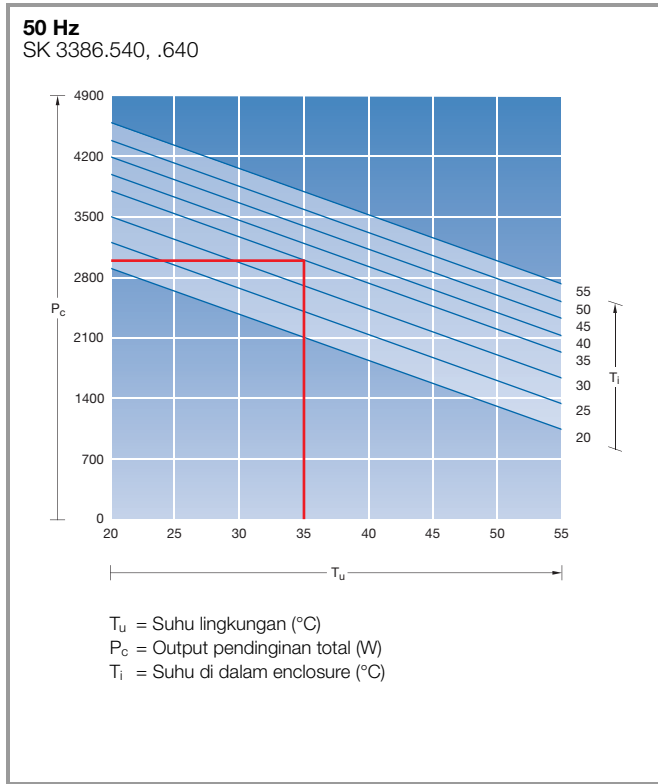
Kelas output 2000 W (115/230 V, 1~, 400 V, 2~)



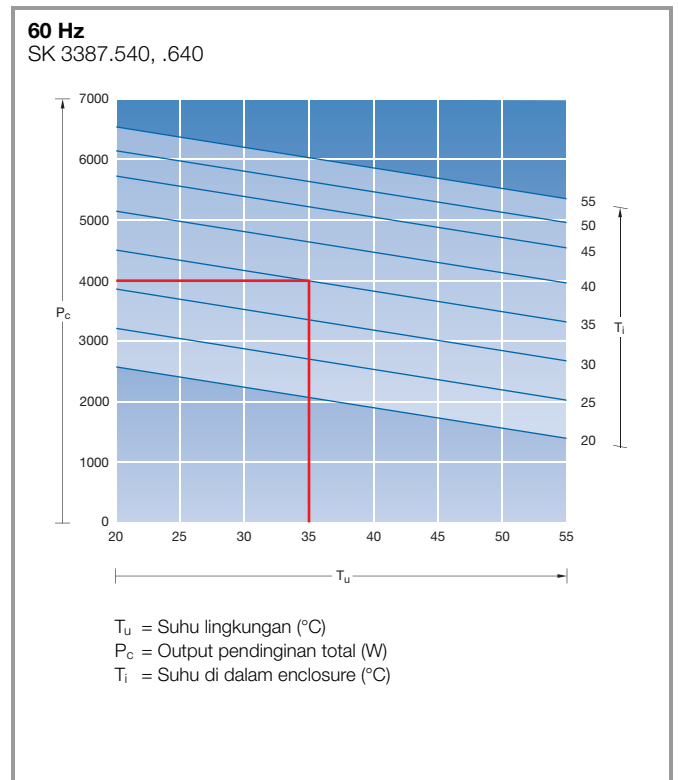
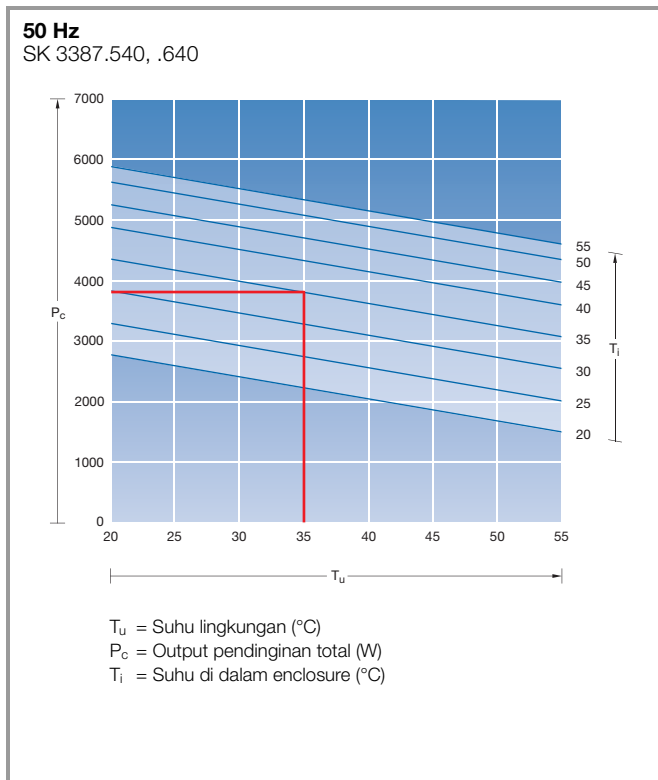
Perangkat pendingin

Perangkat pendingin terpasang pada atap TopTherm Blue e

Kelas output 3000 W (400/460 V, 3~)

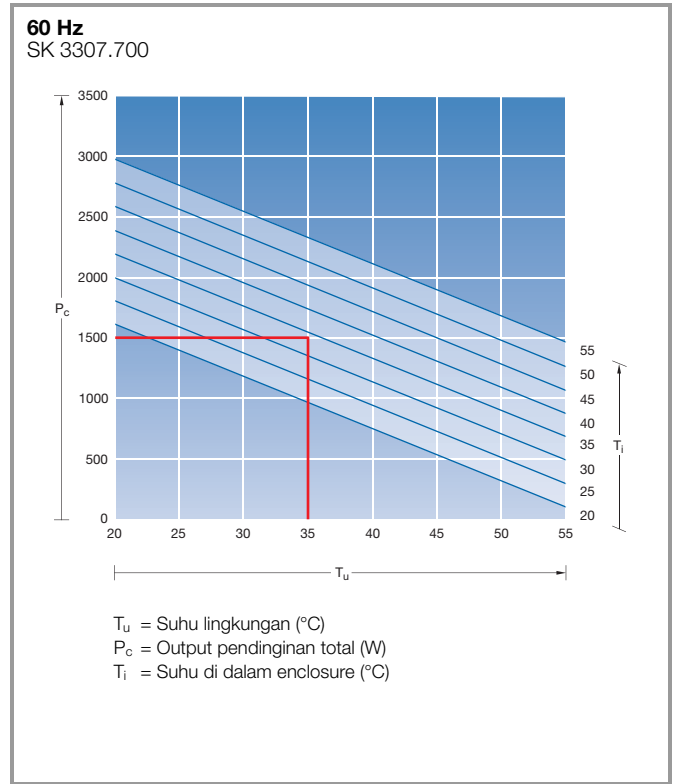
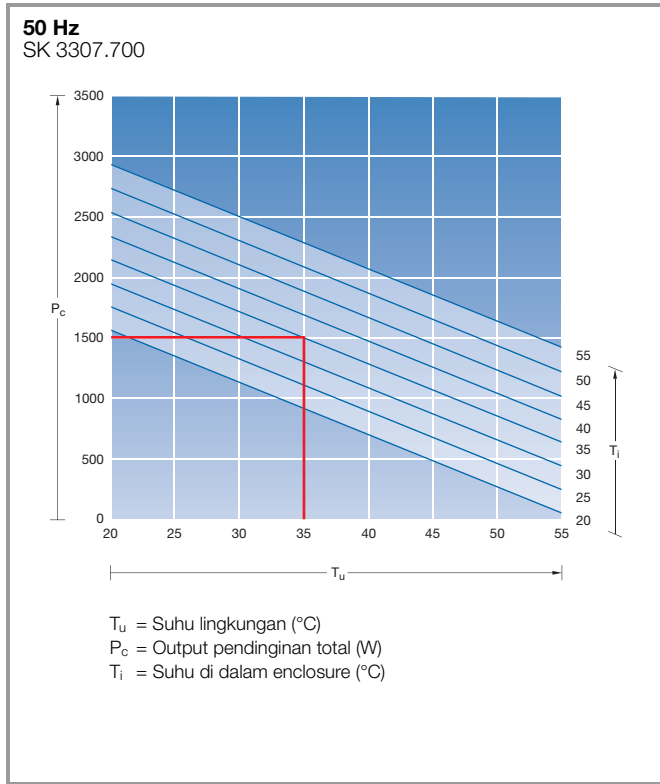


Kelas output 4000 W (400/460 V, 3~)

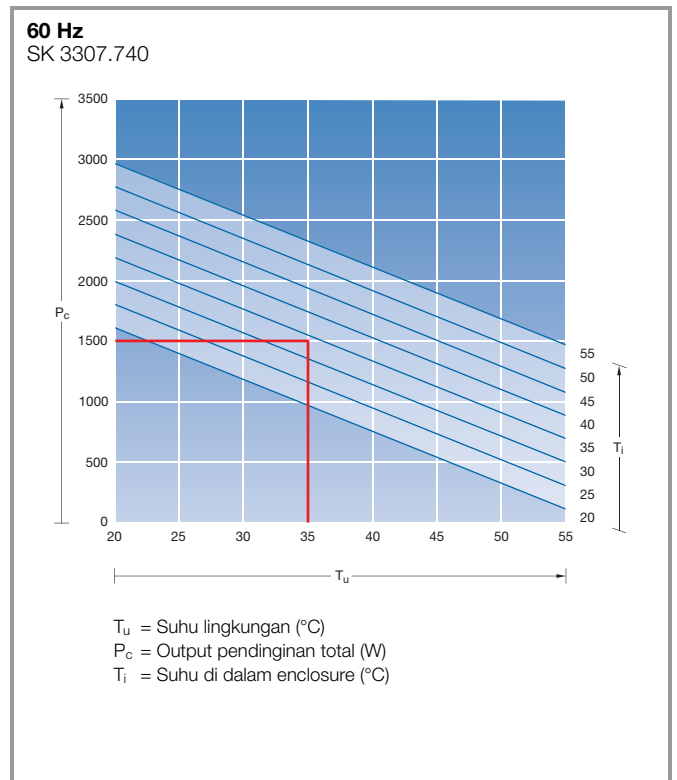
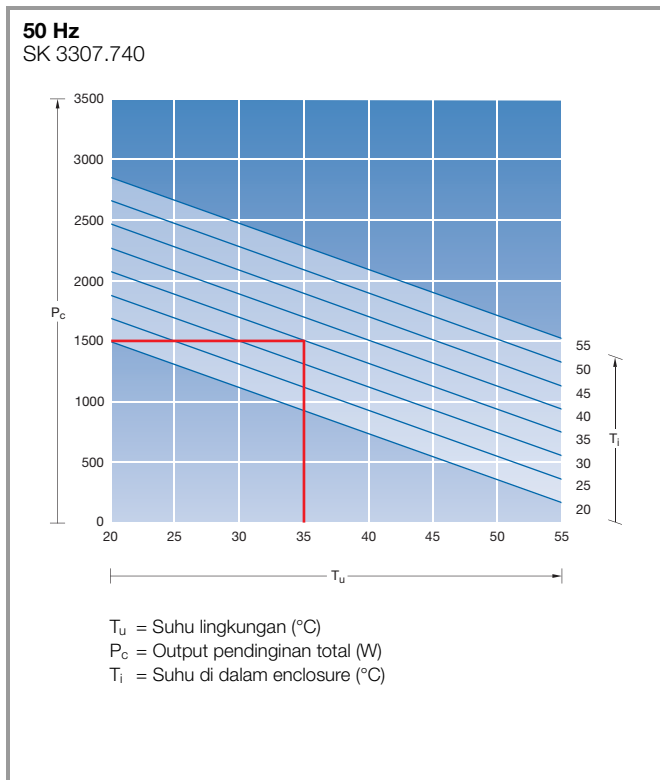


Konsep modul pengatur iklimisasi - modul pendinginan Blue e

Kelas output 1500 W (230 V, 1~)



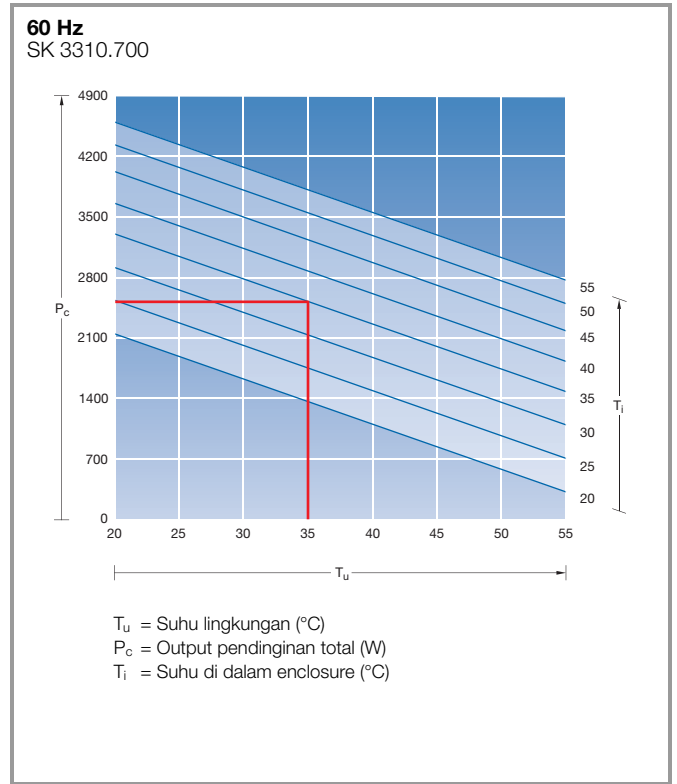
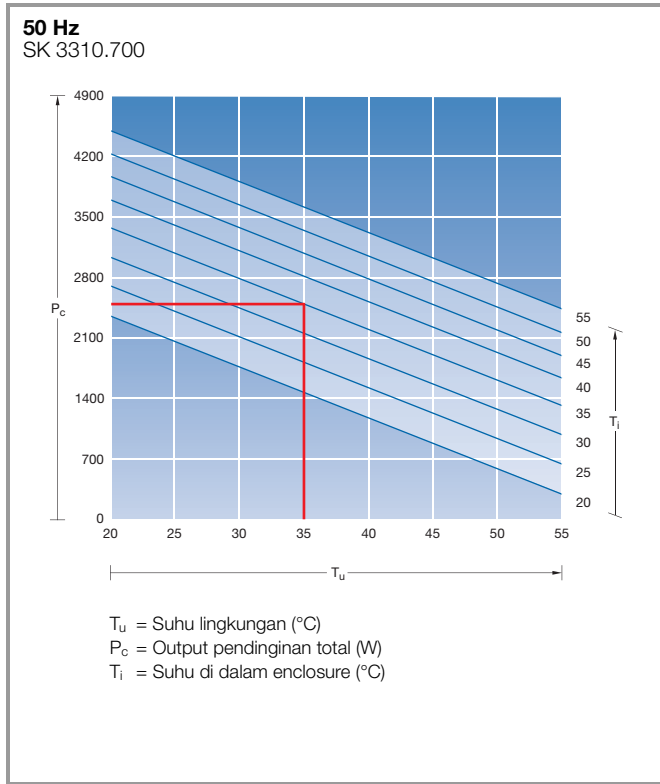
Kelas output 1500 W (400/460 V, 3~)



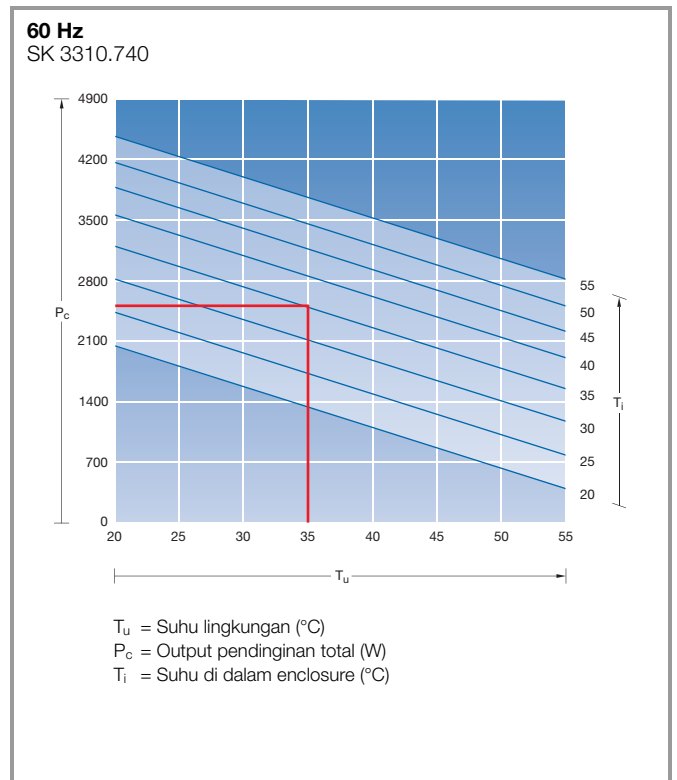
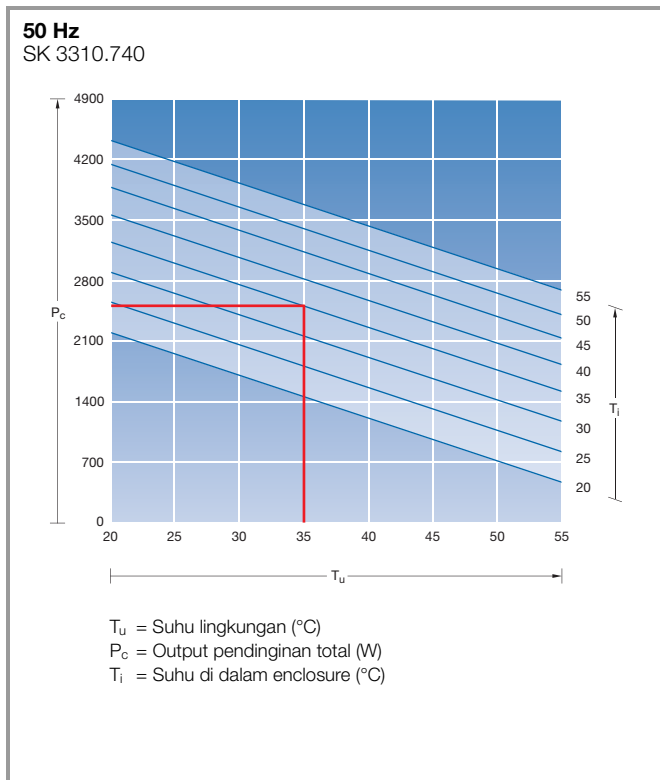
Perangkat pendingin

Konsep modul pengatur iklimisasi - modul pendinginan Blue e

Kelas output 2500 W (230 V, 1~)



Kelas output 2500 W (400/460 V, 3~)



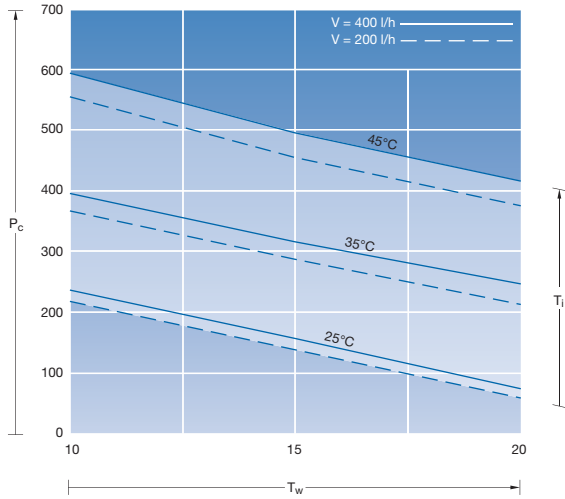
Exchanger udara/air-panas terpasang pada dinding

Kelas output 300 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50/60 Hz

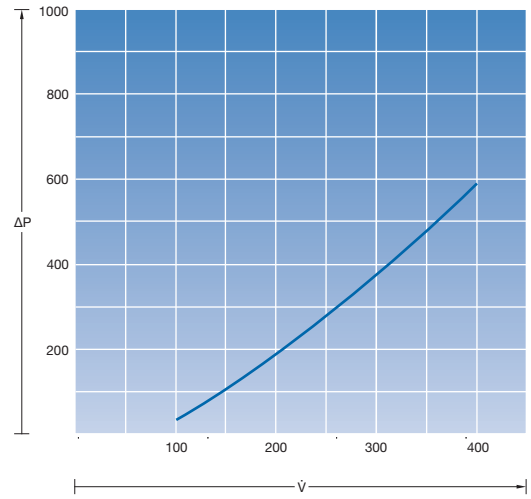
SK 3212.024, .115, .230



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3212.024, .115, .230



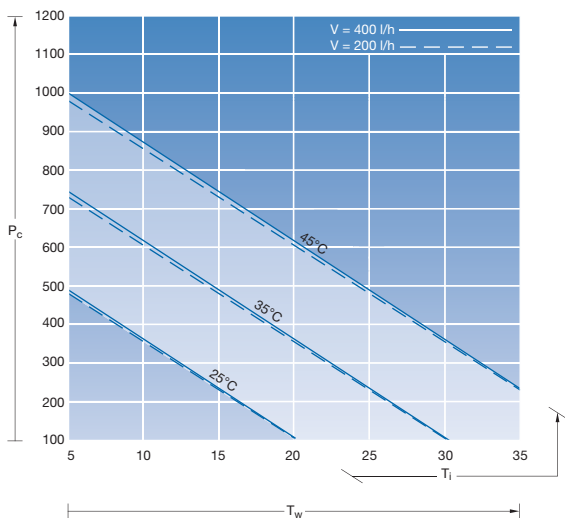
\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

Kelas output 600 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50/60 Hz

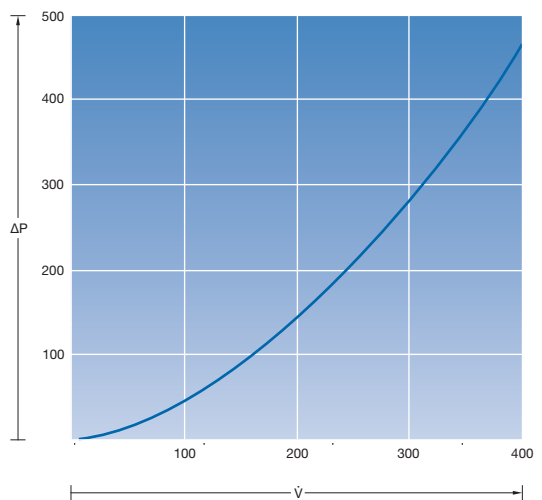
SK 3214.100



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3214.100



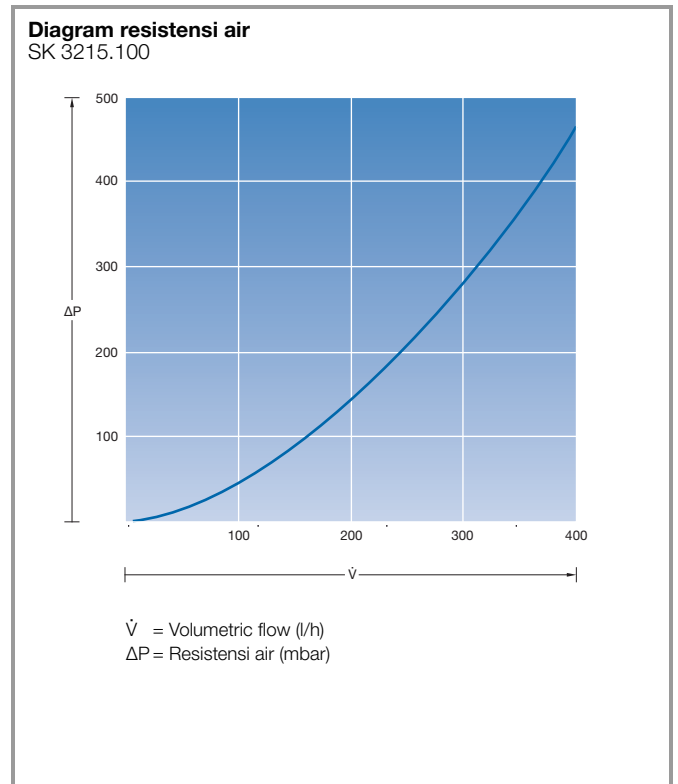
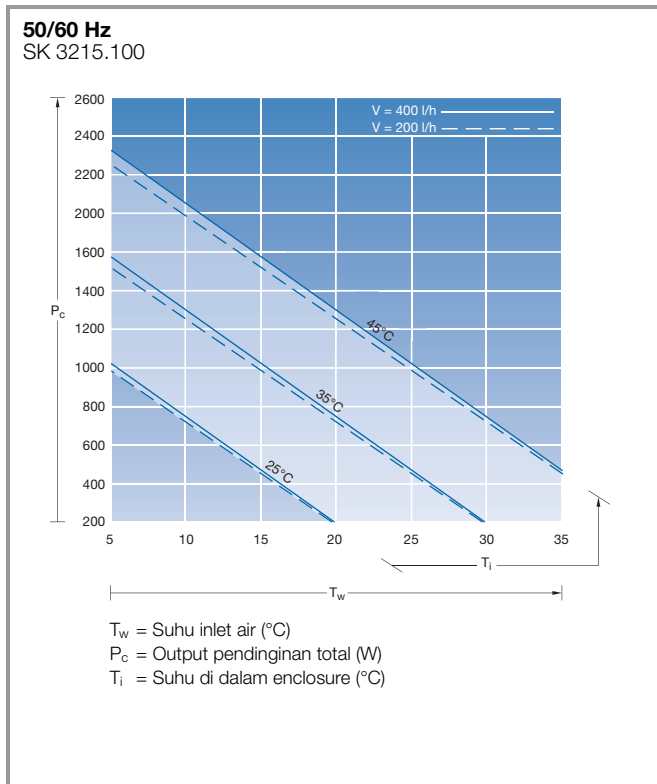
\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

Pendinginan cairan

Exchanger udara/air-panas terpasang pada dinding

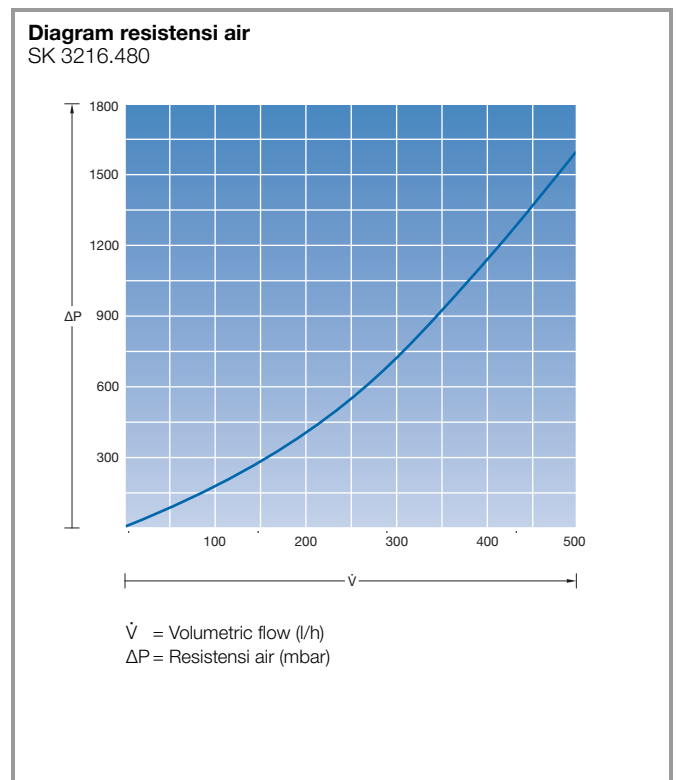
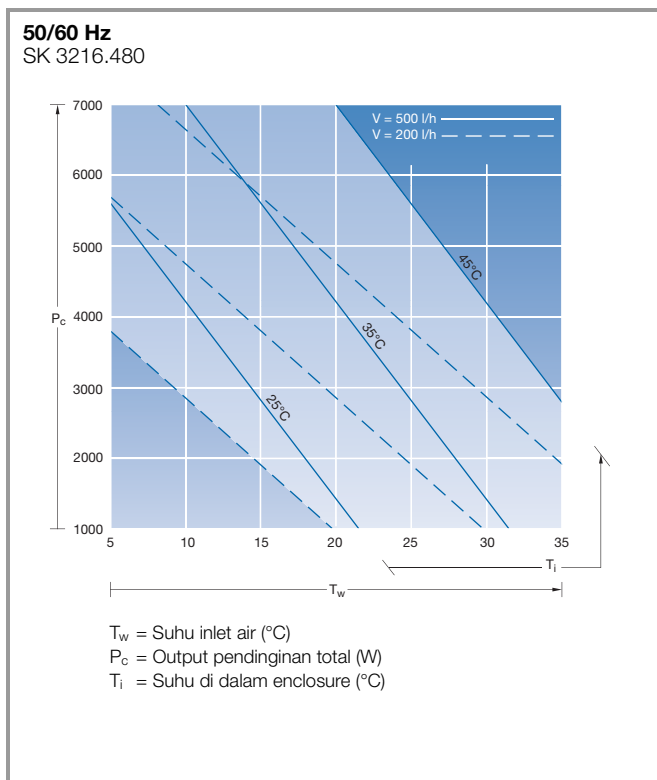
Kelas output 1250 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)



Kelas output 7000 W

Komponen penyaluran air Tembaga/kuningan (Cu/CuZn)



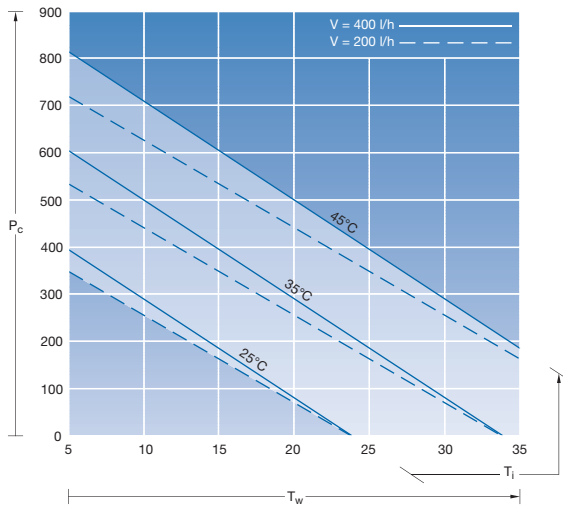
Exchanger udara/air-panas terpasang pada dinding

Kelas output 500 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

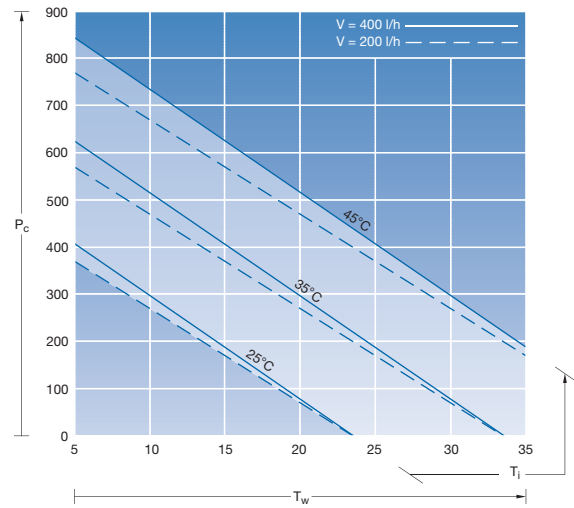
SK 3363.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

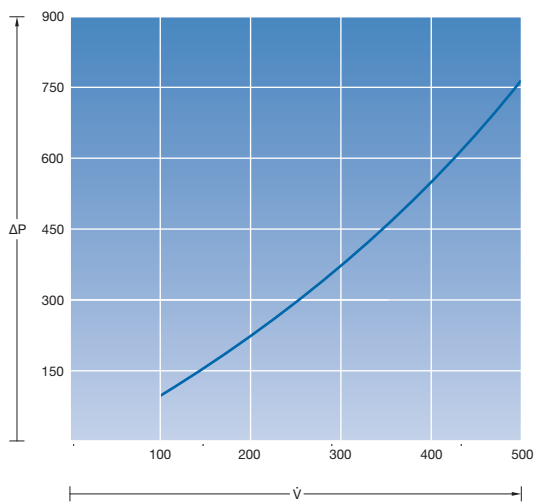
SK 3363.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3363.100, .500



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

Pendinginan cairan

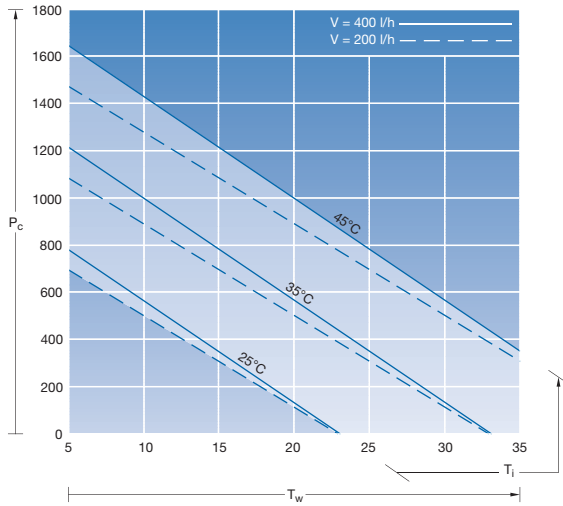
Exchanger udara/air-panas terpasang pada dinding

Kelas output 1000 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

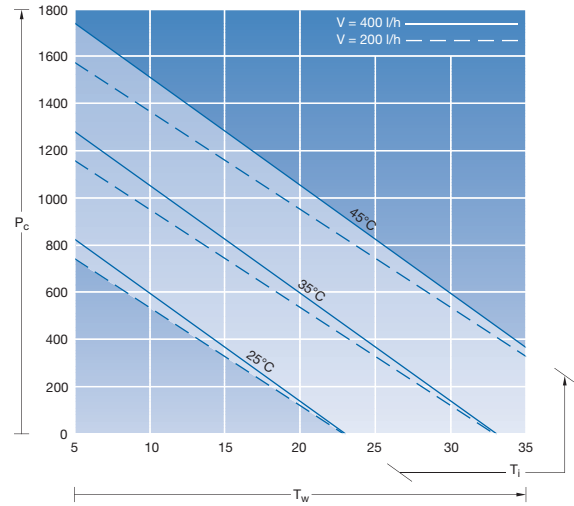
SK 3364.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

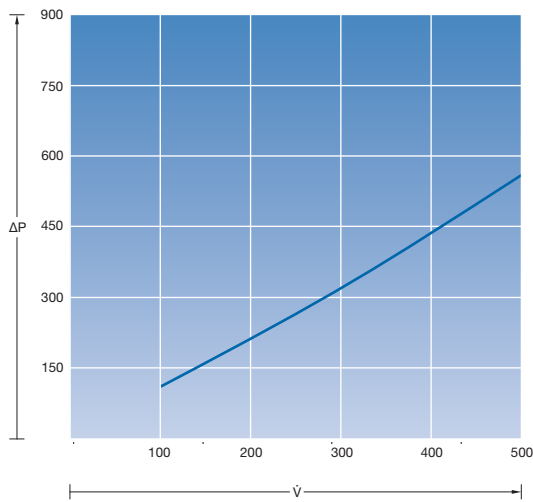
SK 3364.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3364.100, .500



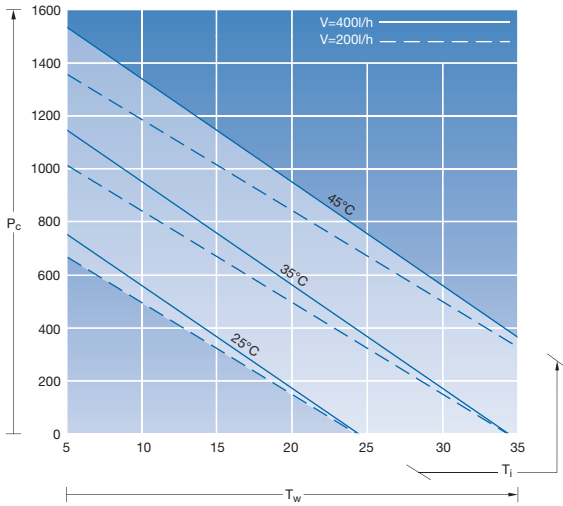
\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

Exchanger udara/air-panas terpasang pada dinding

Kelas output 1000 W

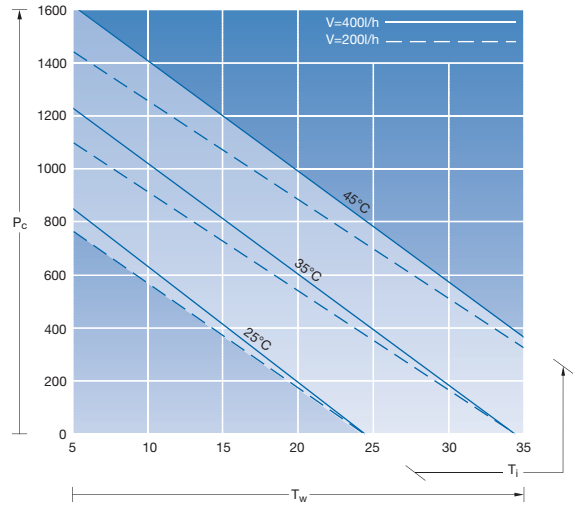
Komponen penyaluran air: Baja tahan karat (1.4571)

50 Hz
SK 3364.504



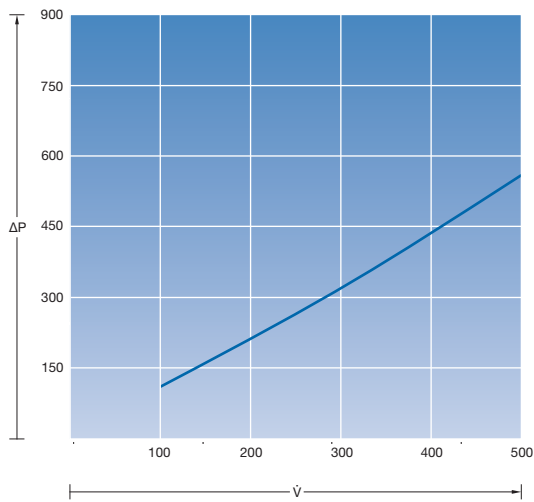
T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz
SK 3364.504



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air
SK 3364.504



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

Pendinginan cairan

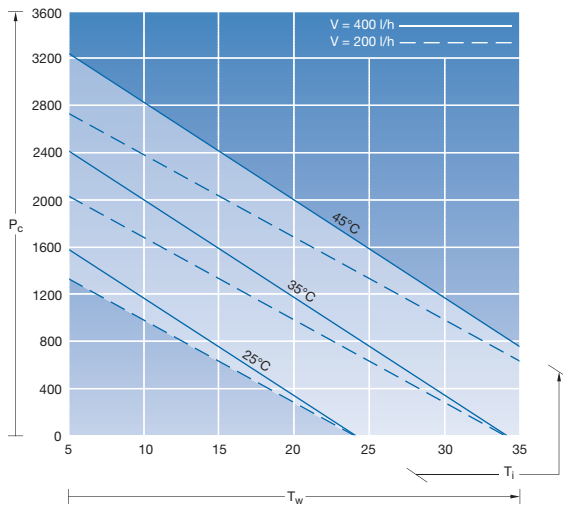
Exchanger udara/air-panas terpasang pada dinding

Kelas output 2000 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

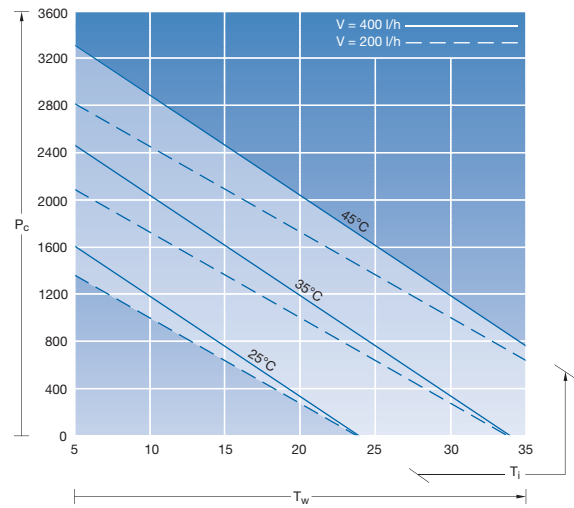
SK 3373.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

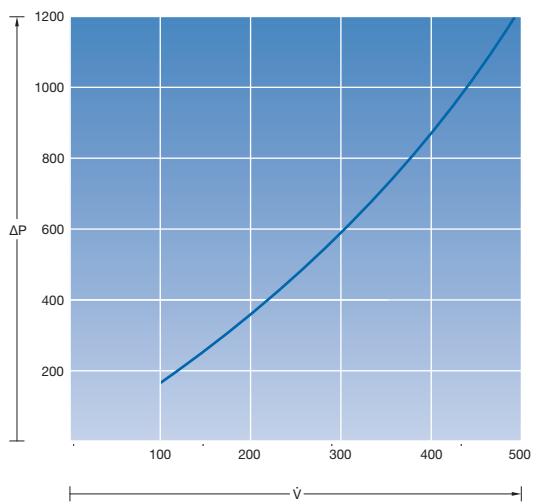
SK 3373.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3373.100, .500



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

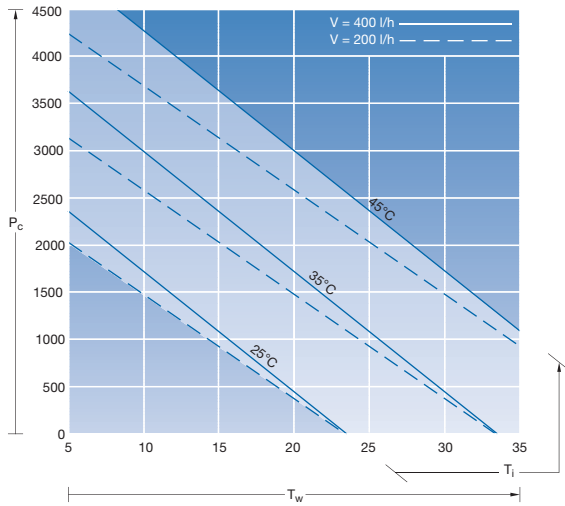
Exchanger udara/air-panas terpasang pada dinding

Kelas output 3000 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

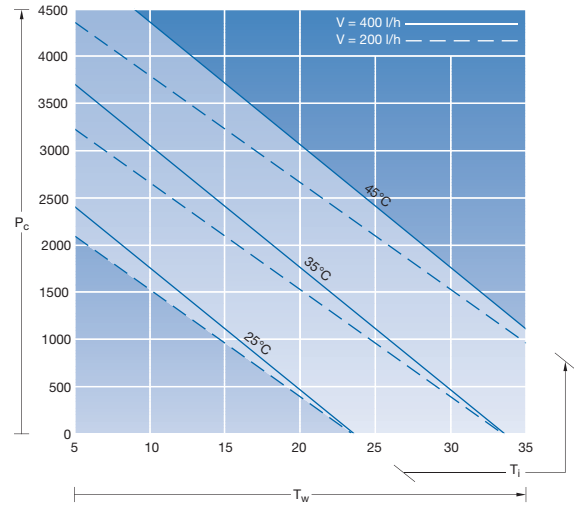
SK 3374.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

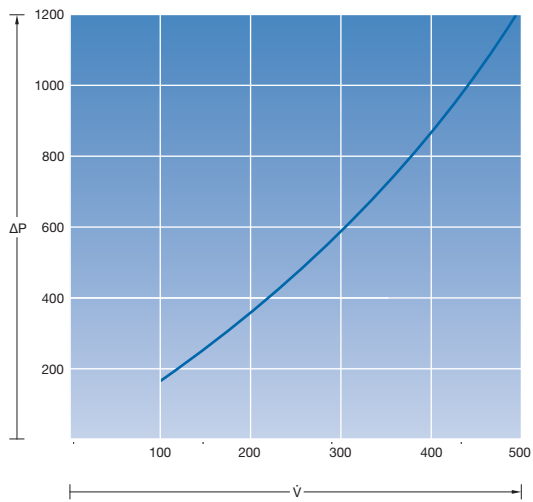
SK 3374.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3374.100, .500



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

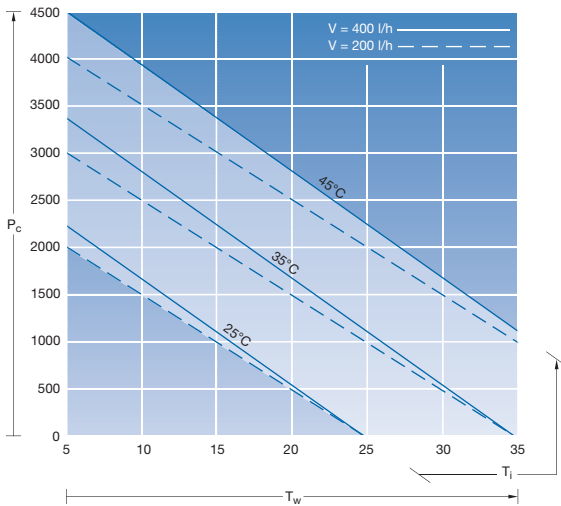
Pendinginan cairan

Exchanger udara/air-panas terpasang pada dinding

Kelas output 2500 W

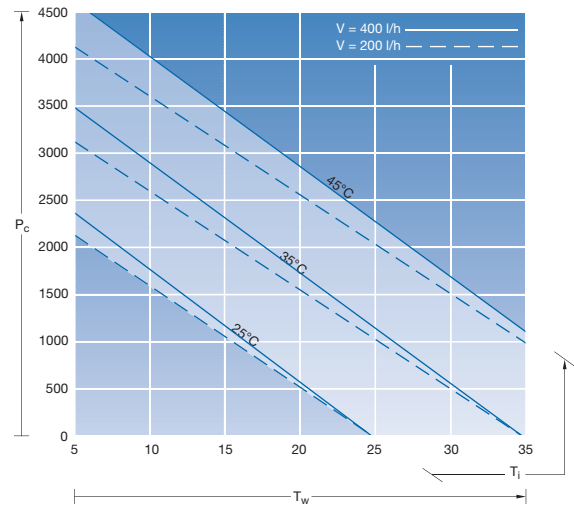
Komponen penyaluran air: Baja tahan karat (1.4571)

50 Hz
SK 3374.504



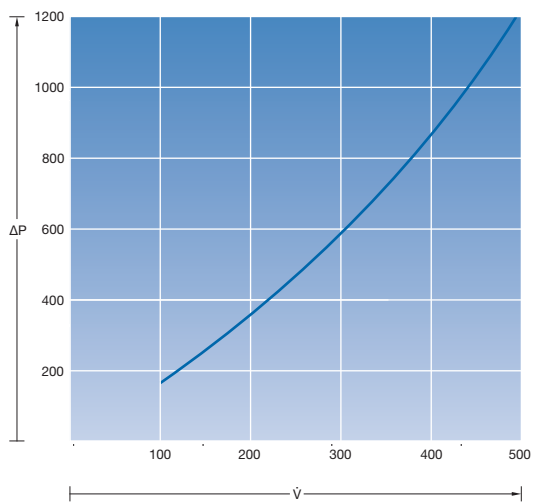
T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz
SK 3374.504



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air
SK 3374.504



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

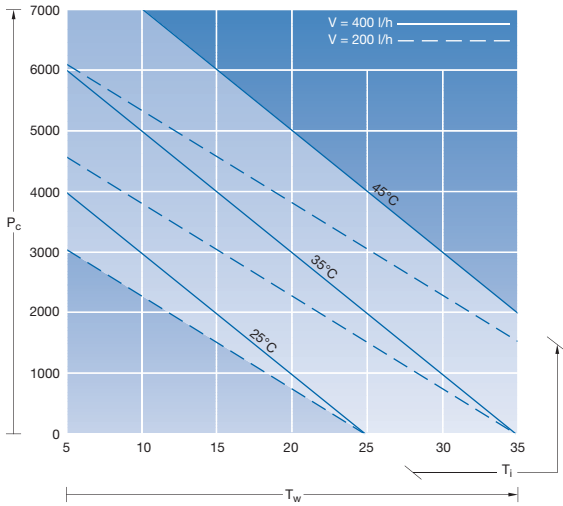
Exchanger udara/air-panas terpasang pada dinding

Kelas output 5000 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

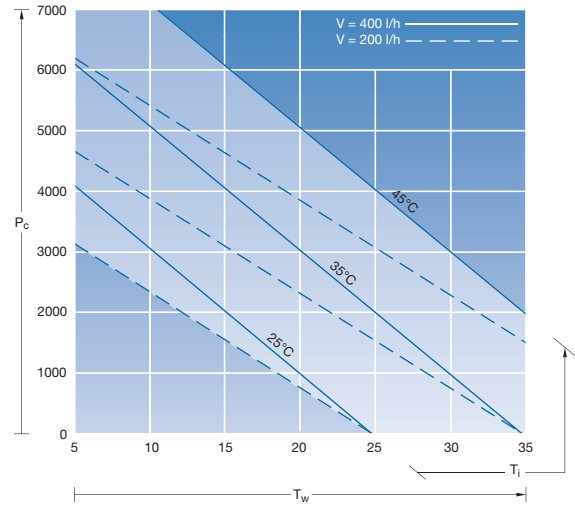
SK 3375.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

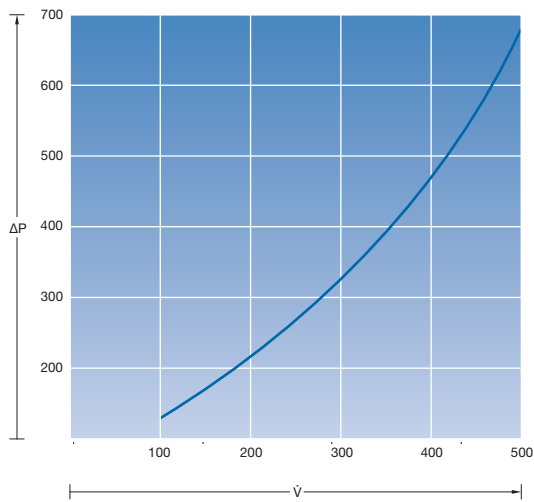
SK 3375.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3375.100, .500



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

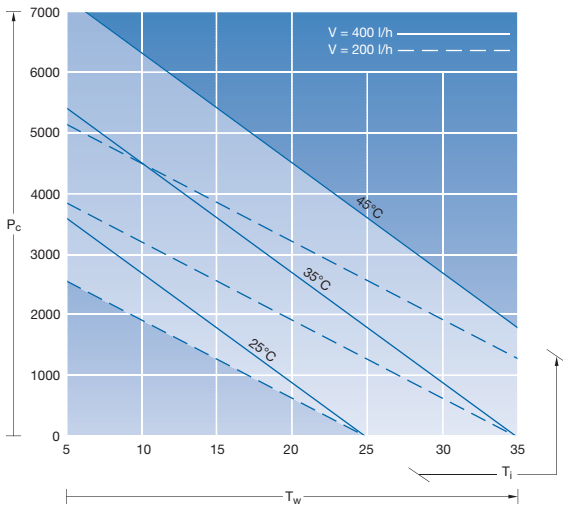
Pendinginan cairan

Exchanger udara/air-panas terpasang pada dinding

Kelas output 4000 W

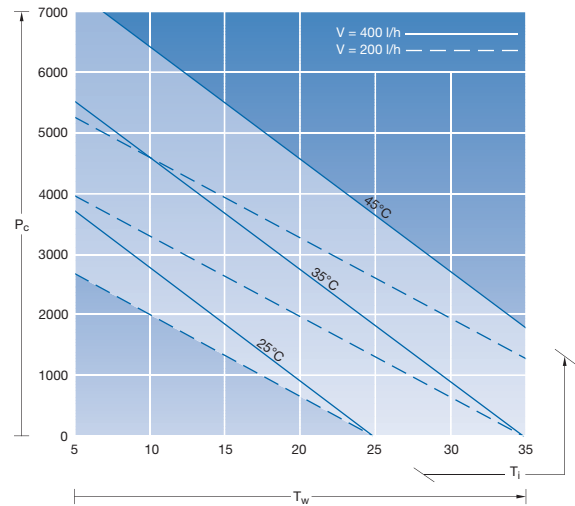
Komponen penyaluran air: Baja tahan karat (1.4571)

50 Hz
SK 3375.504



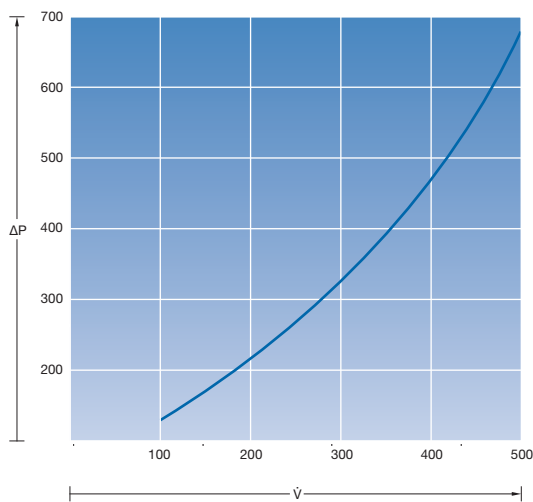
T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz
SK 3375.504



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air
SK 3375.504



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

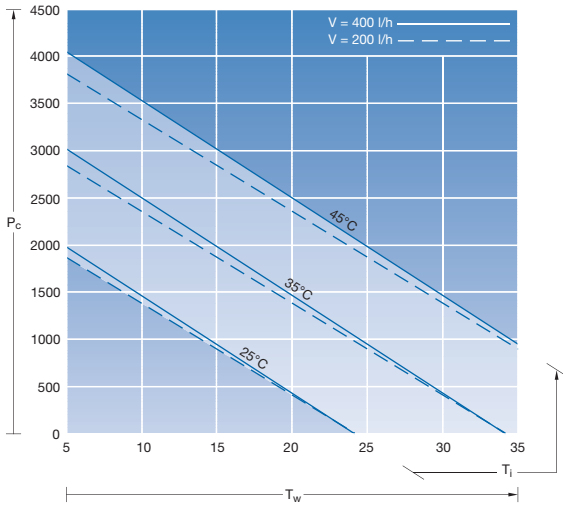
Exchanger udara/air-panas terpasang pada atap

Kelas output 2500 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

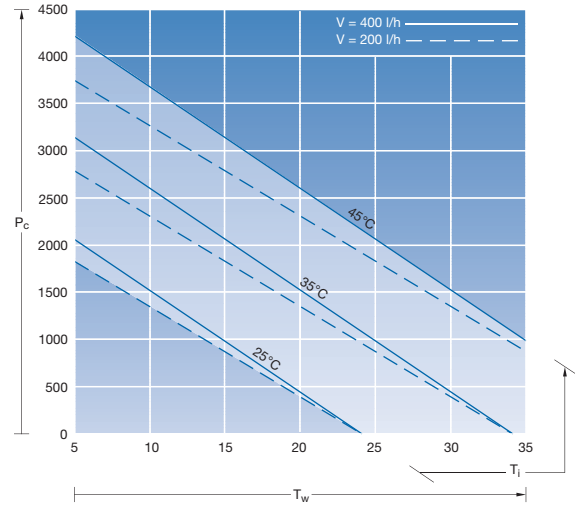
SK 3209.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

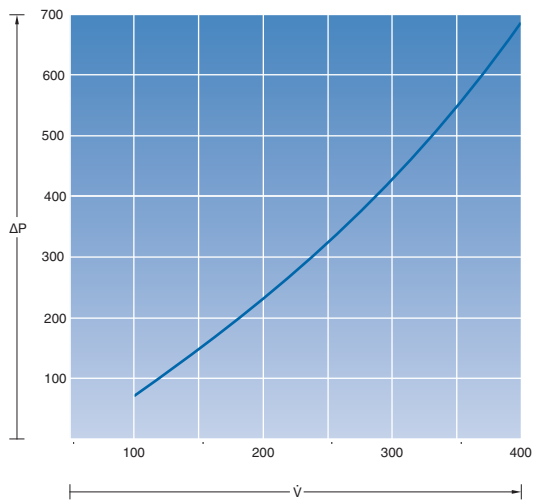
SK 3209.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3209.100, .500



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

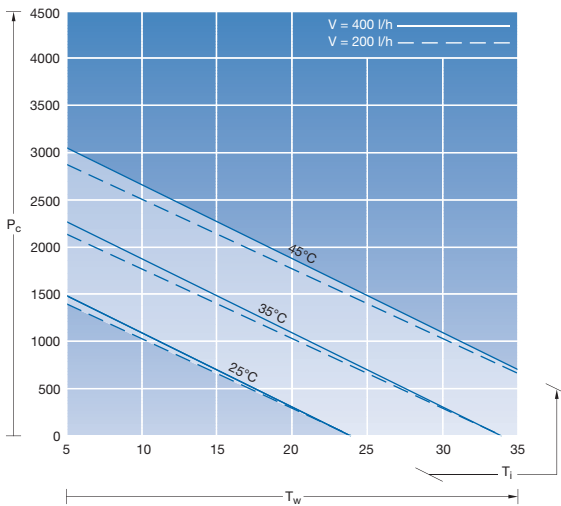
Pendinginan cairan

Exchanger udara/air-panas terpasang pada atap

Kelas output 1875 W

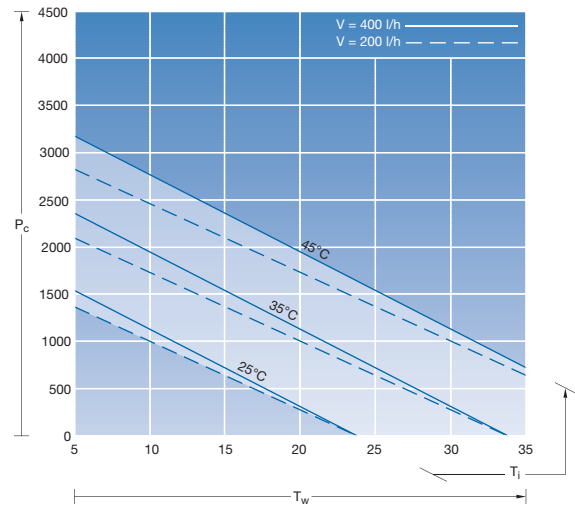
Komponen penyaluran air: Baja tahan karat (1.4571)

50 Hz
SK 3209.504



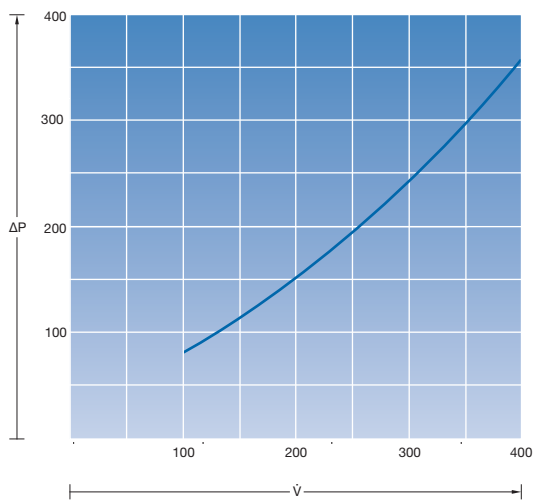
T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz
SK 3209.504



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air
SK 3209.504



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

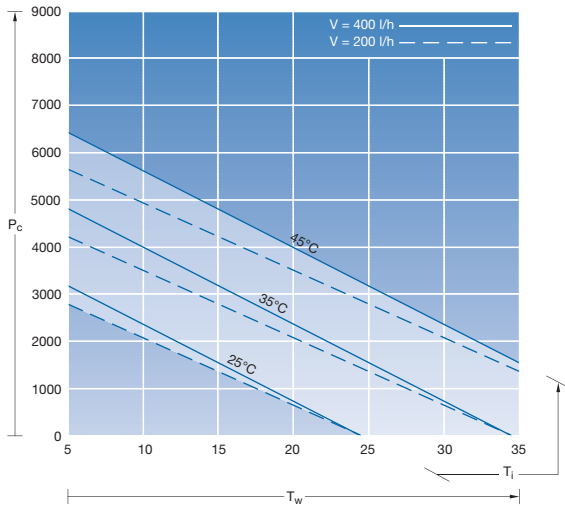
Exchanger udara/air-panas terpasang pada atap

Kelas output 4000 W

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

50 Hz

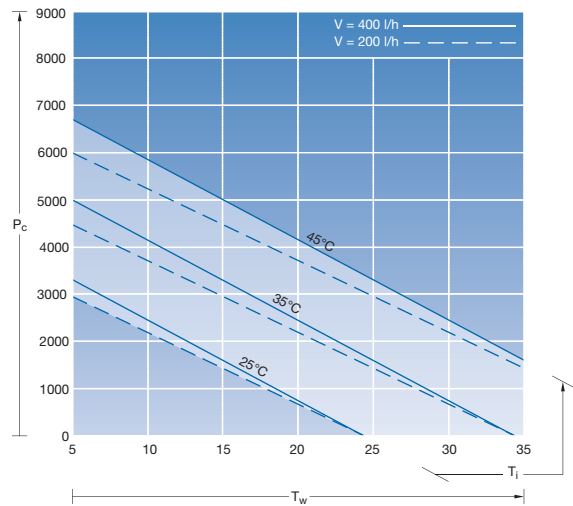
SK 3210.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

60 Hz

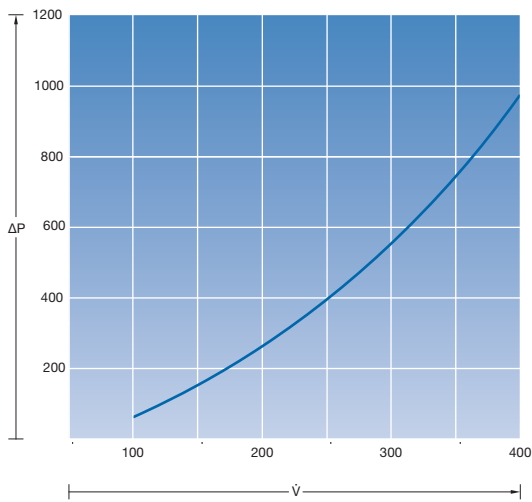
SK 3210.100, .500



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3210.100, .500



\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

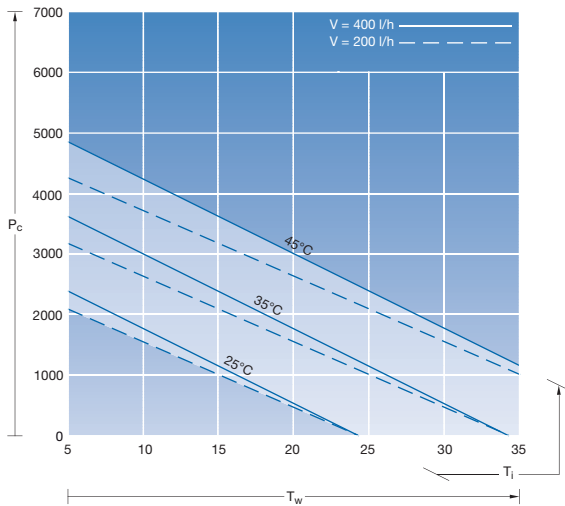
Pendinginan cairan

Exchanger udara/air-panas terpasang pada atap

Kelas output 3000 W

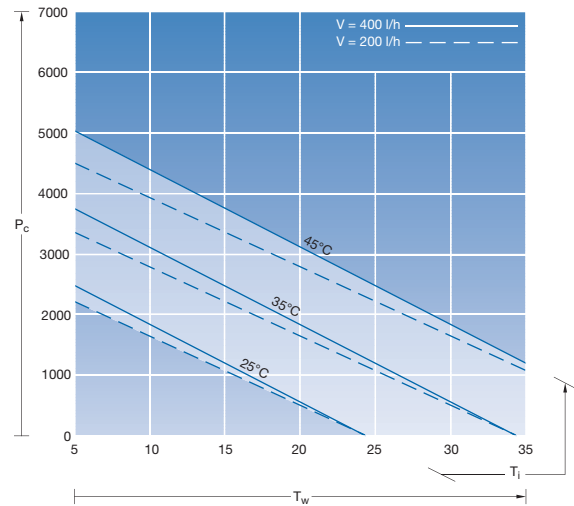
Komponen penyaluran air: Baja tahan karat (1.4571)

50 Hz
SK 3210.504



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

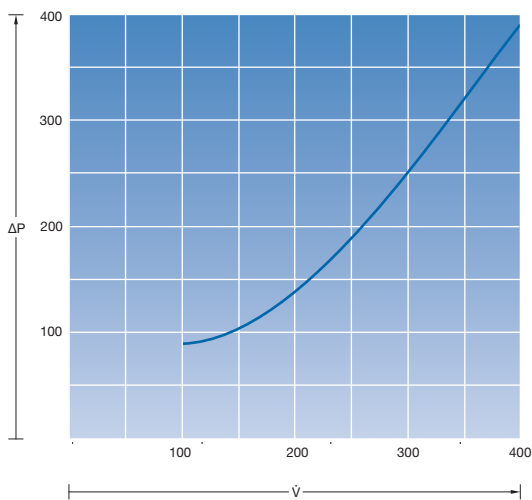
60 Hz
SK 3210.504



T_w = Suhu inlet air (°C)
 P_c = Output pendinginan total (W)
 T_i = Suhu di dalam enclosure (°C)

Diagram resistensi air

SK 3210.504

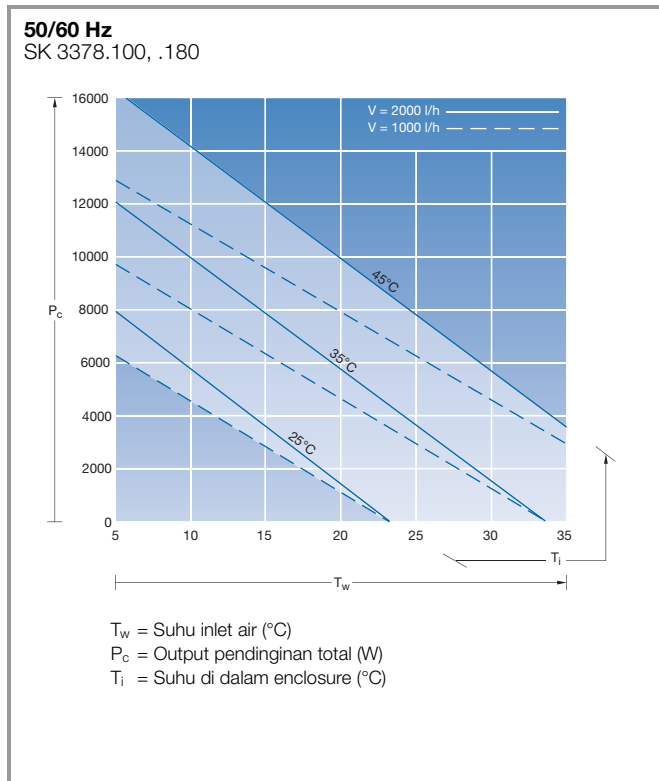


\dot{V} = Volumetric flow (l/h)
 ΔP = Resistensi air (mbar)

Liquid Cooling Package

Kelas output 10 kW, LCP Rack industrial

Komponen penyaluran air: Tembaga/kuningan (Cu/CuZn)

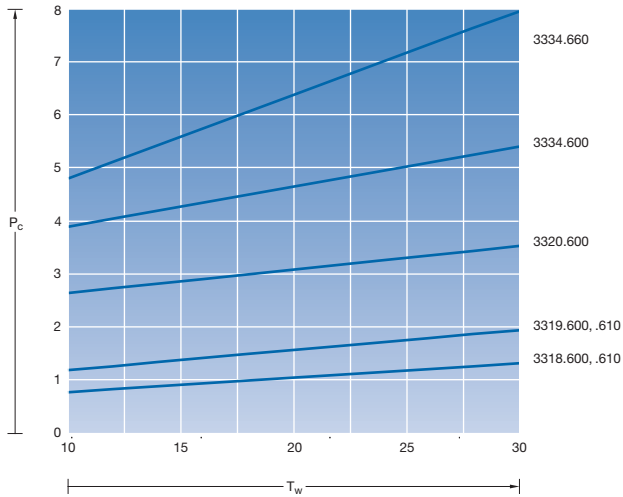


Pendinginan cairan

Chiller TopTherm

Kelas output 1 – 6 kW

50 Hz at $T_u = 32^\circ\text{C}$ (ambient temperature)

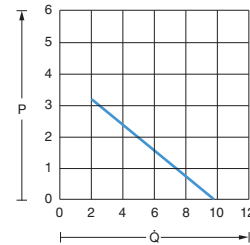


T_w = Suhu inlet air ($^\circ\text{C}$)
 P_c = Output pendinginan total (kW)

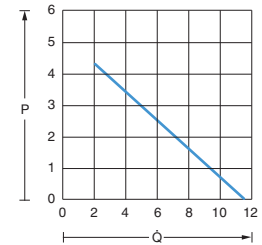
Kurva karakteristik pompa

SK 3318.600/SK 3318.610/SK 3319.600/SK 3319.610

50 Hz

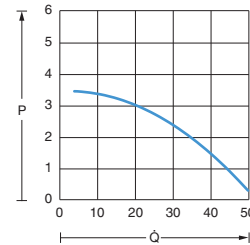


60 Hz

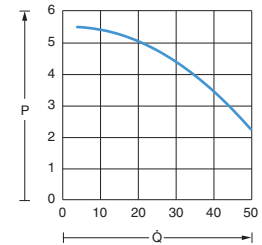


SK 3320.600/SK 3334.600/SK 3334.660

50 Hz



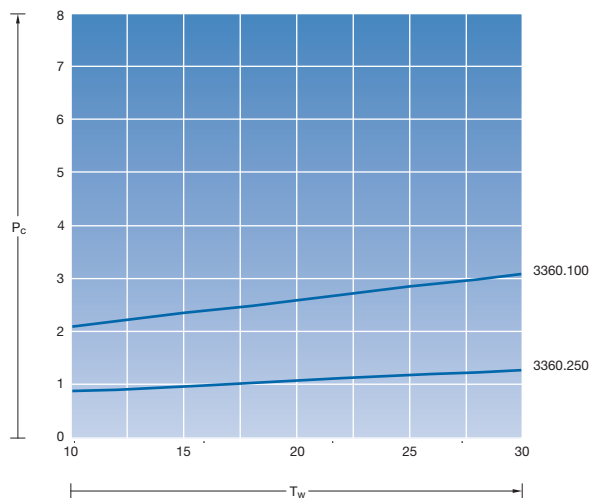
60 Hz



P = Tekanan statis eksternal [bar]
 \dot{Q} = Delivery flow Q [l/min]

Kelas output 1 – 2,5 kW, terpasang pada dinding

50 Hz at $T_u = 32^\circ\text{C}$ (ambient temperature)

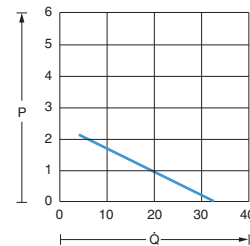


T_w = Suhu inlet air ($^\circ\text{C}$)
 P_c = Output pendinginan total (kW)

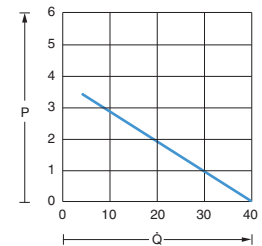
Kurva karakteristik pompa

SK 3360.100, .250

50 Hz



60 Hz

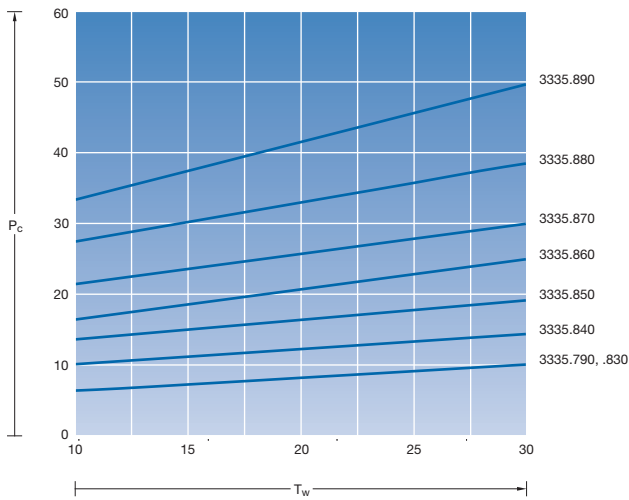


P = Tekanan statis eksternal [bar]
 \dot{Q} = Delivery flow Q [l/min]

Chiller TopTherm

Kelas output 8 – 40 kW

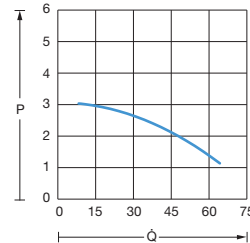
50 Hz at $T_u = 32^\circ\text{C}$ (ambient temperature)



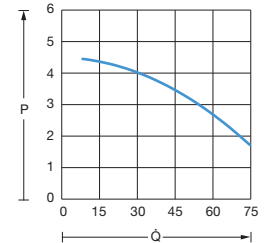
T_w = Suhu inlet air ($^\circ\text{C}$)
 P_c = Output pendinginan total (kW)

Kurva karakteristik pompa
SK 3335.850

50 Hz

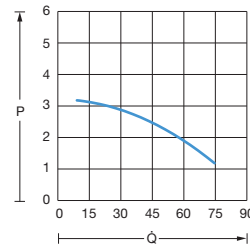


60 Hz

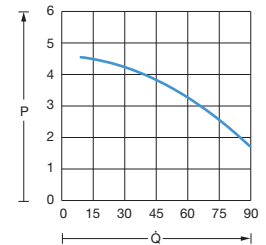


SK 3335.860

50 Hz

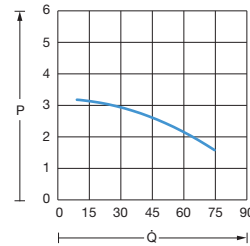


60 Hz

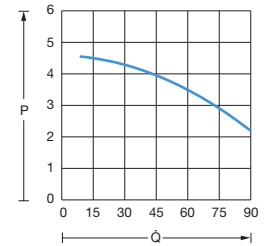


SK 3335.870

50 Hz

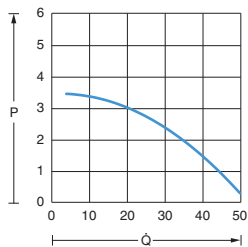


60 Hz

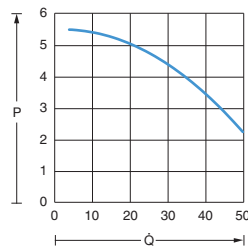


Kurva karakteristik pompa
SK 3335.790, .830

50 Hz

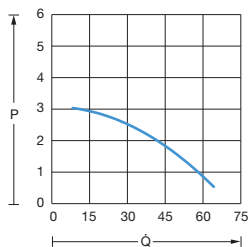


60 Hz

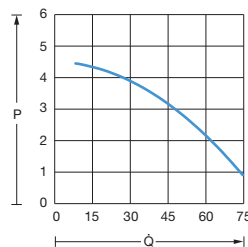


SK 3335.840

50 Hz

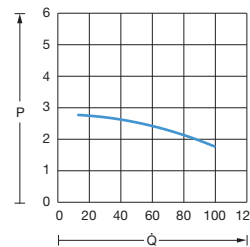


60 Hz

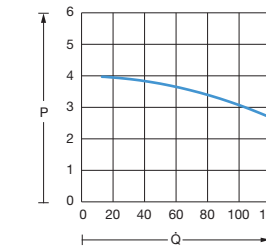


SK 3335.880

50 Hz

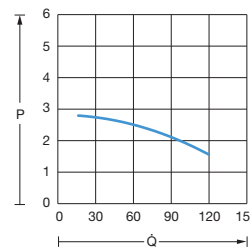


60 Hz

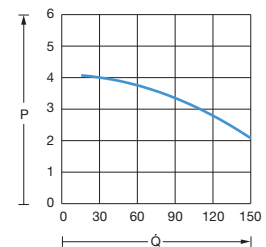


SK 3335.890

50 Hz



60 Hz



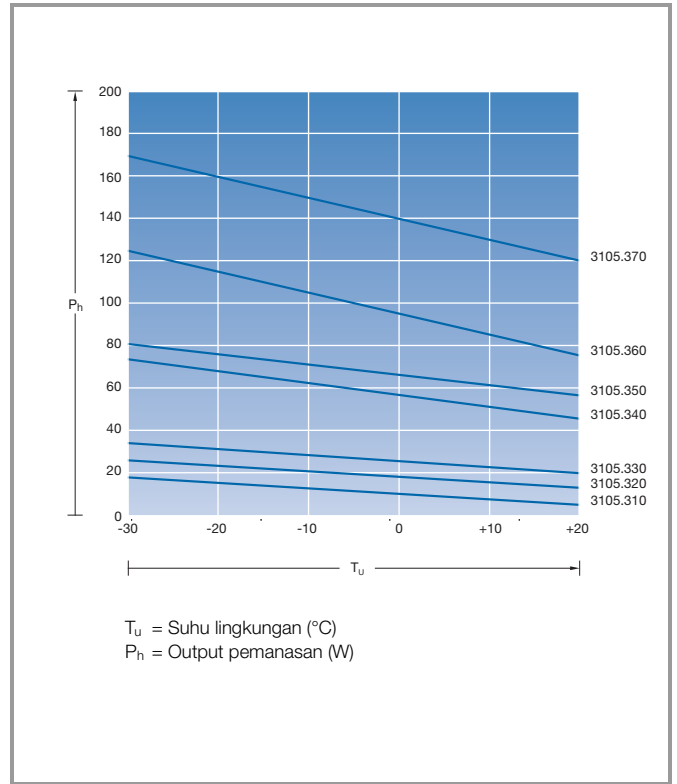
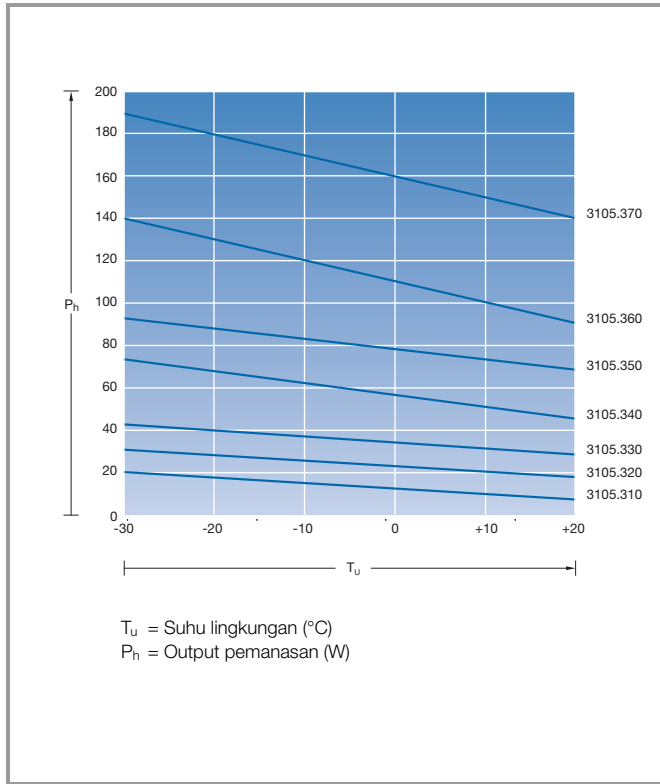
P = Tekanan statis eksternal [bar]
 \dot{Q} = Delivery flow Q [l/min]

Heater enklosur

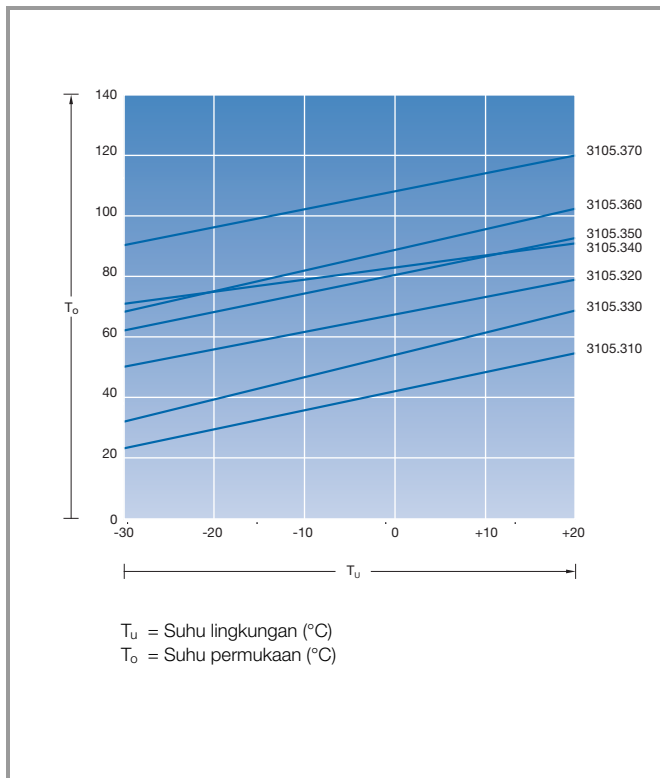
Heater enklosur tanpa kipas

230 V

110 V



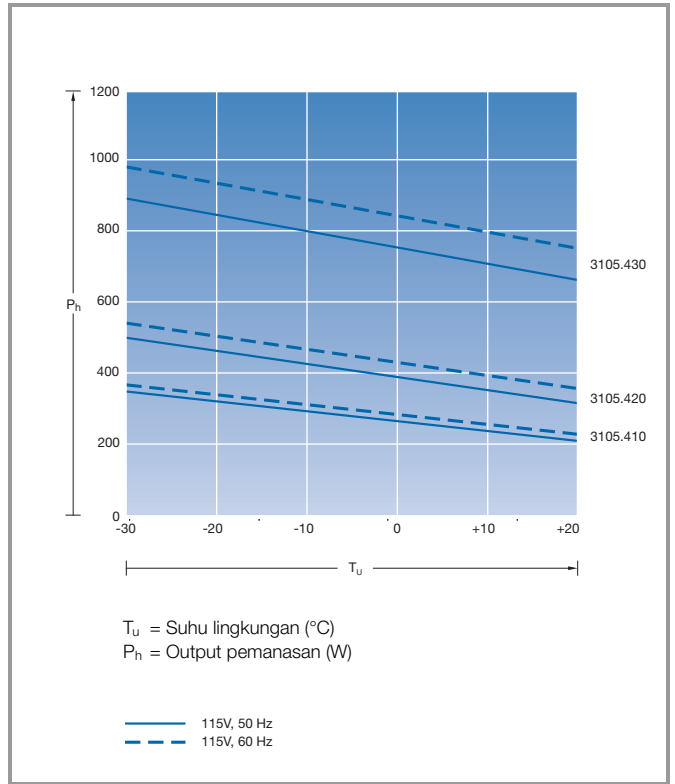
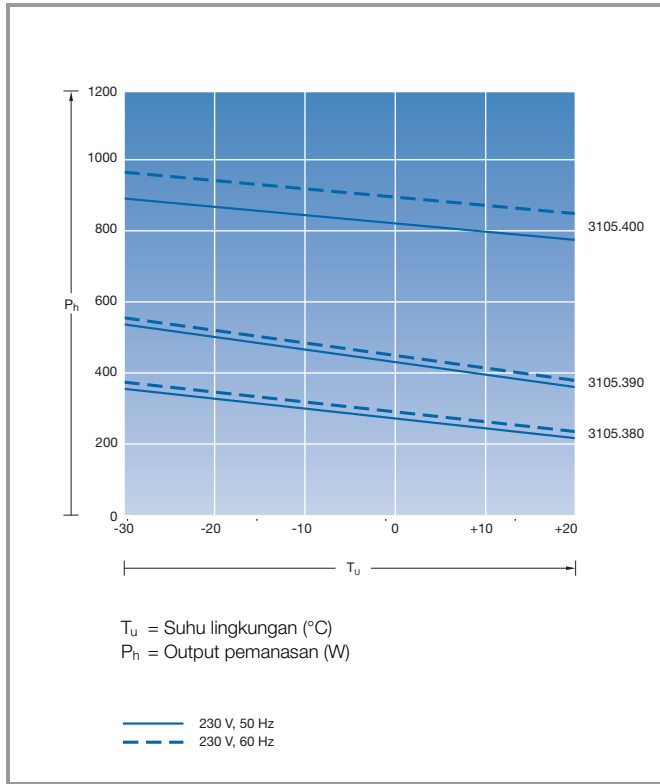
Suhu permukaan maksimum



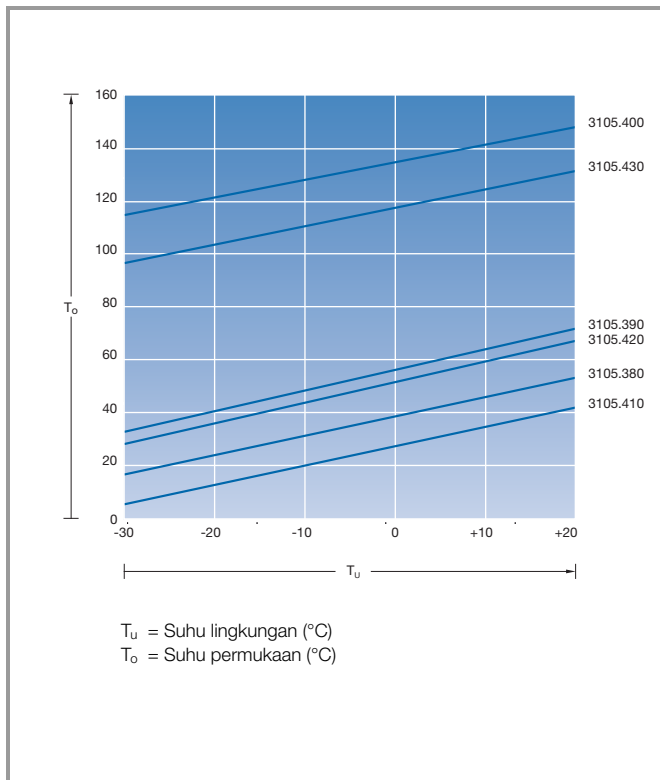
Heater enklosur dengan kipas

230 V, 50/60 Hz

115 V, 50/60 Hz



Suhu permukaan maksimum



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- Kontrol udara
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