

# Rittal – The System.

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air/water heat exchanger

SK 3212.xxx SK 3214.100  
SK 3216.480 SK 3215.100

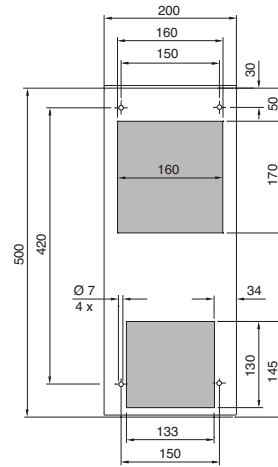
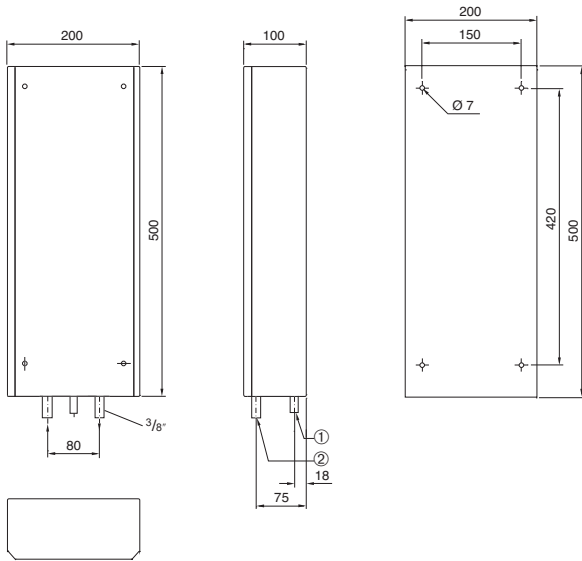
## Assambly instructions



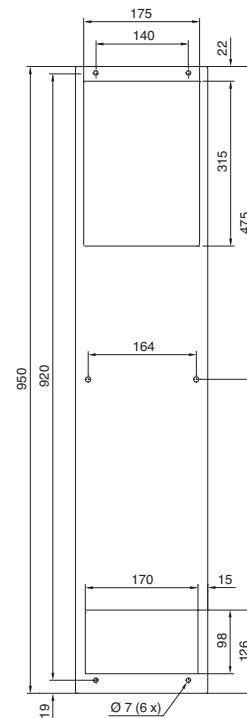
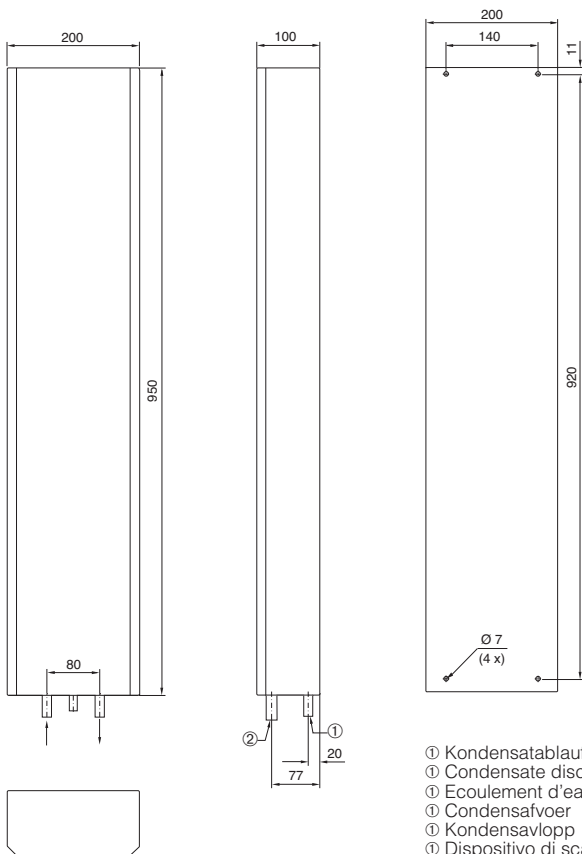
Befestigungsbohrungen Einbau  
Fastening holes for internal mounting  
Perçages pour montage encastré  
Bevestigingsgaten voor inbouw  
Montagehål bild, inbyggnad  
Fori di fissaggio per installazione incassata  
Taladros de fijación para montaje interior  
取付穴 全埋め込み取付け

Montageausbruch Anbau  
Mounting cut-out for external mounting  
Découpe pour montage en saillie  
Montage-uitsparingen, aanbouw  
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Feritoia per installazione sporgente  
Escotadura de montaje para montaje exterior  
取付用カットアウト 表面取付け

SK 3214.100



SK 3215.100



- ① Kondensatablauf
- ① Condensate discharge
- ① Ecoulement d'eau de condensation
- ① Condensafvoer
- ① Kondensavlopp
- ① Dispositivo di scarico condensa
- ① Salida del agua de codensación
- ① 凝縮水排出器

- ② Kühlwasser-Anschluß 1/2"
- ② Cooling water connection 1/2"
- ② Branchement eau de refroidissement 1/2"
- ② Aansluiten koelwater 1/2"
- ② Kylvattenanslutning 1/2"
- ② Allacciamento liquido frigorifero 1/2"
- ② Acometida de 1/2" del agua de refrigeración
- ② 給水部 1/2 インチ

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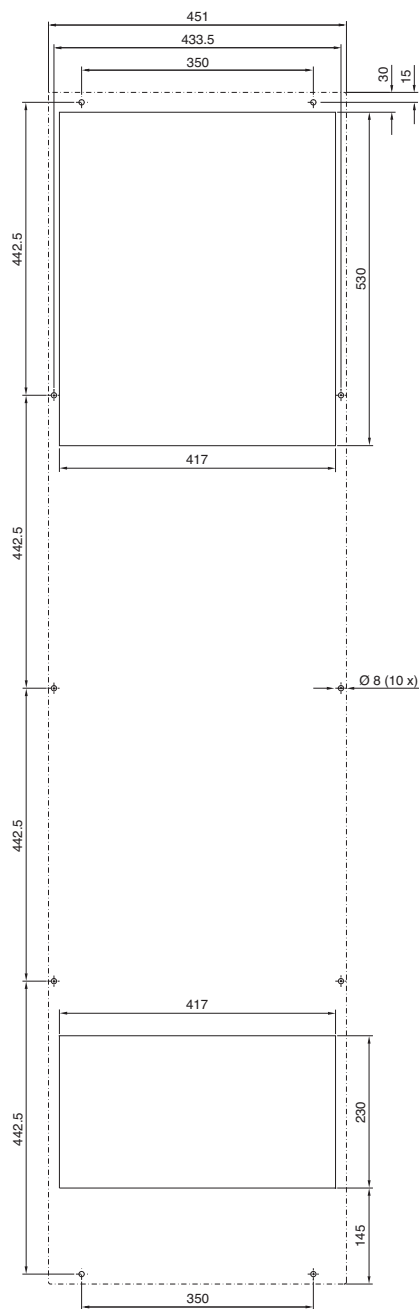
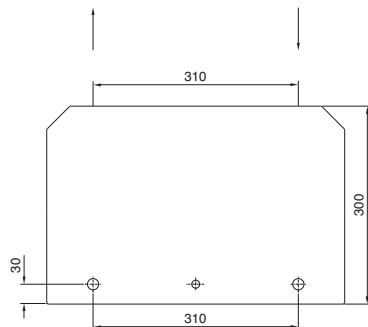
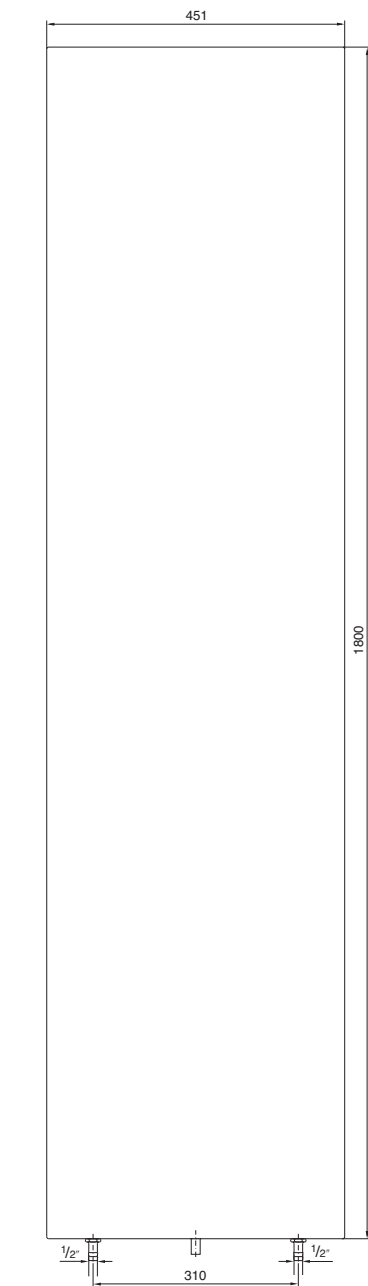
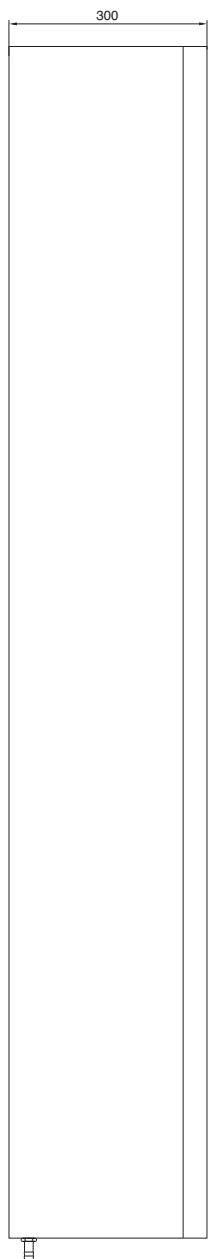
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**Montageausbruch Anbau**  
**Mounting cut-out for external mounting**  
**Découpe pour montage en saillie**  
**Montage-uitsparingen, aanbouw**  
**Montagehålbild, påbyggnad**  
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**Escotadura de montaje para montaje exterior**  
**取付用カットアウト 表面取付け**

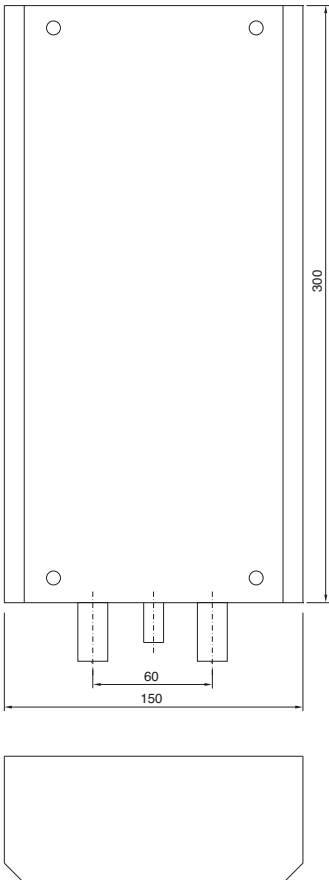
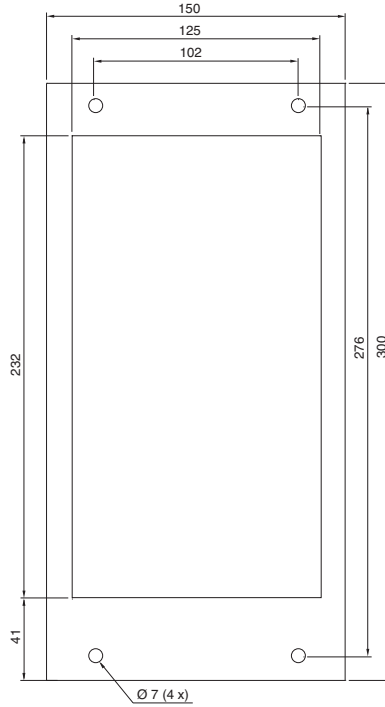
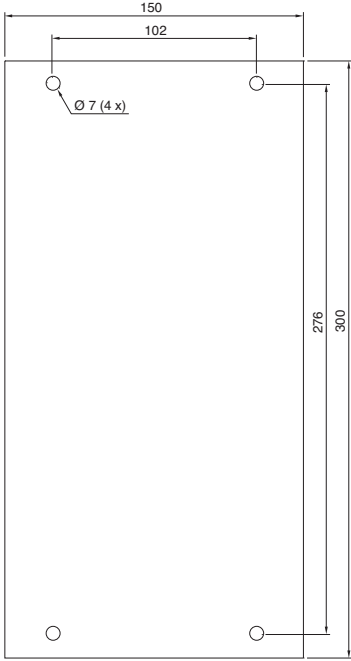
SK 3216.480



Befestigungsbohrungen Einbau  
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SK 3212.xxx



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- ② Acometida de 3/8" del agua de refrigeración
- ② 給水部 3/8 インチ

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D	Bemessungsbetriebsspannung	Bemessungsstrom	Vorsicherung T	Einschalt-dauer	Nutzkühlleistung	Kühlmedium: Wasser (s. Spezifikation)	Wasservorlauf-temperatur	Umgebungs-temperaturbereich	Betriebsdruck	Geräuschpegel	Schutzart Innenkreislauf Außenkreislauf	Abmessungen (B x H x T) mm	Gewicht	Farbton
GB	Operating voltage	Rated current	Pre-fuse T	Duty cycle	Useful cooling output	Refrigerant: Water (see specification)	Water inlet temperature	Ambient temperature	Operating pressure	Noise level	Protection categ. Internal circuit External circuit	Dimensions (W x H x D) mm	Weight	Colour
F	Tension nominale	Courant nominal	Dispositif de sécurité T	Durée de mise en circuit	Puissance frigorifique en régime permanent	Fluide frigorigène: de l'eau (voir les spécifications)	Température de l'eau à l'entrée	Température ambiante	Pression de régime	Niveau sonore	Ind. de protect. Circuit intérieur Circuit extérieur	Dimensions (L x H x P) mm	Poids	Teinte
NL	Bedrijfs-spanning	Nominale stroom	Voor-zekering, traag T	Inschakel-duur	Nuttig koelvermogen	Koelmedium: Water (zie specificatie)	Waterinlaat-temperatuur	Omgevings-temperatuur-bereik	Bedrijfs-druk	Geluidsnivo	Beschermklasse Inwendig circuit Uitwend. circuit	Afmetingen (B x H x D) mm	Gewicht	Kleur
S	Märkspanning	Märkström	Försäkring T	Inkopp-lingstid	Effektiv kyl-effekt	Kylmedel: Vatten (se specifikation)	Tillvatten-temperatur	Omgivnings-temperatur	Vattentryck	Ljudnivå	Kapslingsklass Inre kretslopp Yttre kretslopp	Mått (B x H x D) mm	Vikt	Färgton
I	Tensione nominale	Corrente nominale	Fusibile ritardato T	Intermit-tenza	Potenza frigorifera utile	Mezzo frigorifero: Acqua (vedi specifica)	Temperatura di ingresso dell'acqua	Campo di temperatura d'impiego	Pressione di esercizio	Livello di rumorosità	Grado di protez. Circuito interno Circuito esterno	Dimensioni (L x A x P) mm	Peso	Colore
E	Tensión de servicio	Intensidad nominal	Fusible T	Duración de conexión	Potencia frigorífica útil	Agente refrigerante: Agua (ver especificación)	Temperatura del agua de entrada	Campo de temperatura ambiente	Presión máxima admisible	Nivel de ruido	Protección Circuito interior Circuito exterior	Dimensiones (anch. x alt. x prof.) mm	Peso	Color
J	定格電圧	定格電流	バックアップヒューズ	デュータイサイクル	有効冷却能力	冷却材：水（冷却材仕様参照）	注入時水温	外部温度範囲	動作圧	騒音レベル	保護等級 内部回路 外部回路	外形寸法（幅 x 高さ x 奥行）mm	質量	カラー
					L35 W10, 200 l/h L35 W10, 400 l/h						EN 60 529			
SK 3212.024	24 VDC,	1,20 A	2,0 A	100 %	300 W (200 l/h)		> +1°C – +30°C	+1°C – +70°C	1 – 10 bar	42 dB (A)	IP 55	150 x 300 x 80	3 kg	RAL 7035
SK 3214.100	230 V, 50/60 Hz	0,17 A / 0,18 A	2,0 A / 2,0 A	100 %	600 W (200 l/h) 650 W (400 l/h)		> +1°C – +30°C	+1°C – +70°C	1 – 10 bar	42 dB (A)	IP 55	200 x 500 x 100	7 kg	RAL 7035
SK 3217.100	230 V, 50/60 Hz	0,60 A / 0,55 A	4,0 A / 4,0 A	100 %	1000 W (200 l/h) 1100 W (400 l/h)		> +1°C – +30°C	+1°C – +70°C	1 – 10 bar	44 dB (A)	IP 55	298 x 520 x 135	9,5 kg	RAL 7035
SK 3215.100	230 V, 50/60 Hz	0,38 A / 4,0 A	4,0 A / 4,0 A	100 %	1250 W (200 l/h) 1300 W (400 l/h)		> +1°C – +30°C	+1°C – +70°C	1 – 10 bar	53 dB (A)	IP 55	200 x 950 x 100	13 kg	RAL 7035
SK 3216.480	400 V, 3~, 50/60 Hz 480 V, 3~, 60 Hz	1,4 A / 1,6 A 1,2 A	4,0 A / 4,0 A	100 %	7000 W (500 l/h)		> +1°C – +30°C	+1°C – +70°C	1 – 10 bar	70 dB (A)	IP 55	450 x 1800 x 300	79 kg	RAL 7035



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## 1. Application

Air/water heat exchangers are designed and built to dissipate heat from enclosures, by cooling the air inside the enclosure and protecting temperature sensitive components. Air/water heat exchangers are particularly suitable for the temperature range of +40°C to +70°C, where for system related reasons, comparable units such as air/air heat exchangers, enclosure cooling units or fan units with filters cannot be used to dissipate heat effectively and economically.

## 2. Technical data

(see table 2.1).

## 3. Assembly

Please use the enclosed drilling template to cut out the component apertures.

**SK 3212.230 / SK 3214.100 / SK 3215.100 / SK 3216.480**

### External installation of the unit

Screw the four fastening bolts ①, together with the washer ② and nut ③, to the mounting level ④ of the enclosure. Push the heat exchanger ⑤ into position and secure with four screws ⑥.

### Internal installation of the unit (Fig. page 30):

Insert four fastening bolts ① into the appliance from behind. Slide the fixing ring ⑦ onto the fastening bolts as a mounting aid. Screw the appliance, together with the washer ② and nut ③, to the mounting level of the enclosure from the outside. Push the protective cap ⑧ onto the nut.

## 4. Electrical connection

The connection voltage and frequency must correspond to the rated values quoted on the data plate. The unit must be connected to the mains via a disconnection device which ensures at least 3 mm contact opening in the deactivated state. No additional temperature control must be connected to the supply side of the unit. Line protection should be provided by means of the pre-fuse specified on the name plate. Please observe the relevant regulations when installing!

**The mains connection is made at the connection terminal**

## 5. Cooling water connection

The cooling water connection must be made with pressure resistant flexible hoses which should be secured with clips.

**(Note the direction of flow and check for absence of leaks!)**

The units have no separate air-bleed. With pressure-sealed systems, corresponding air-bleed facilities are to be installed on the water side.

Protect the water circuit from contamination and excess pressure (10 bar max.).

**Please observe the relevant regulations when installing!**

## 6. Refrigeration and control behaviour

The fan of the air circuit operates continuously, thus ensuring an even temperature distribution within the enclosure. A solenoid valve controls the cooling water flow in accordance with the preset temperature. Setting range +20°C to +60°C. Presetting of the enclosure temperature is made,

6.1 for **SK 3214.100 / SK 3215.100 / SK 3216.480**

via the thermostat on the rear of the unit.

6.2 **SK 3212.xxx** has no control unit.

## 7. Leaks and temperature monitoring

### 7.1 Temperature monitoring

Should the temperature inside the enclosure rise by more than

10 K in the models **SK 3214.100 / SK 3215.100 / SK 3216.480**

For **SK 3214.100 / SK 3215.100 / SK 3216.480** the connection of the potential-free contact is made via the plug-in terminal strip on the rear of the unit.

### 7.2 Leak monitoring

In the event of a leakage developing a pipe fracture occurring in the water circuit

- a) the cooling water supply will be cut off immediately,
- b) the potential-free changeover contact will be switched, and
- c) the fan will be switched off.

## 8. Maintenance

The air/water heat exchangers require no maintenance (see point 12.). Check the function of the condensate draining facility regularly.

## 9. Scope of supply and warranty

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- 1 air/water heat exchanger, ready for connection
- 1 sealing tape
- 4 fastening bolts (internal installation of unit 3247.000)
- 4 threaded pins M6 x 30 (internal installation of unit)
- 4 flat-headed screws M6\*
- 4 fixing rings\*
- 4 nuts M6
- 4 washers A 6.4
- 4 protective caps
- 1 set of assembly and operating instructions
- 1 drilling template
- \* Only for SK 3214.100 / SK 3215.100 / SK 3216.480 instead of the threaded pins.

### Guarantee:

This unit is covered by a 1-year guarantee from the date of supply, subject to correct usage. Within this period, the returned unit will be repaired in the factory or replaced free of charge. The unit is to be used for the cooling of enclosures only. If it is connected or handled improperly the manufacturer's guarantee does not apply and in this case we are not liable for any damage caused.

## 10. Safety instructions

- When installing the device, the condensate discharge must be routed out of the enclosure!
- In order to avoid frost damage, the minimum permissible water temperature of +1°C must not be undercut at any point in the water cycle!
- It is essential to obtain the manufacturer's permission before adding anti-freeze!
- During storage and transportation below freezing point, the water cycle should be drained completely using compressed air!
- Only set the thermostat as low as is strictly necessary, because of undercutting the dew point with a falling water inlet temperature (condensation)!
- It is very important that the enclosure is sealed on all sides (IP 54), particularly the cable entry (condensation)!

## 11. Notes on water quality

For safe operation of the equipment, it is essential to observe the VBG guidelines on cooling water (VGB R 455 P).

Cooling water must not contain any limescale deposits or loose debris; in other words, it should have a low level of hardness, particularly a low level of carbon hardness. For recooling within the plant, the carbon hardness should not be too high. On the other hand, however, the water should not be so soft that it attacks the operating materials. When recooling the cooling water, the salt content should not be allowed to increase excessively due to the evaporation of large quantities of water, since electrical conductivity increases as the concentration of dissolved substances rises, and the water thereby becomes more corrosive. For this reason, not only is it always necessary to add a corresponding quantity of fresh water, but also to remove part of the enriched water.

frequently used techniques to eliminate them in industrial cooling are:

Contamination of the water	Procedure
Mechanical contamination	Filtering of water via – Mesh filter – Gravel filter – Cartridge filter – Precoated filter
Excessive hardness	Water softening via ion exchange
Moderate content of mechanical contaminants and hardeners	Addition of stabilisers and/or dispersing agents to the water
Moderate content of chemical contaminants	Addition of passifiers and/or inhibitors to the water
Biological contaminants, slime bacteria and algae	Addition of biocides to the water

In order to ensure correct operation of a recooling system which is operated with water on at least one side, the properties of the added or system

water used should not deviate substantially from the following list of hydrological data:

Hydrological data	SK 3212.xxx / SK 3214.100 / SK 3215.100 / SK 3216.480
pH value	7 – 8.5
Carbonate hardness	> 3 < 8 °dH
Free carbon dioxide	8 – 15 mg/dm <sup>3</sup>
Accompanying carbonic acid	8 – 15 mg/dm <sup>3</sup>
Aggressive carbonic acid	0 mg/dm <sup>3</sup>
Sulphides	free
Oxygen	< 10 mg/dm <sup>3</sup>
Chloride ions	< 50 mg/dm <sup>3</sup>
Sulphate ions	< 250 mg/dm <sup>3</sup>
Nitrates and nitrites	< 10 mg/dm <sup>3</sup>
COD	< 7 mg/dm <sup>3</sup>
Ammonia	< 5 mg/dm <sup>3</sup>
Iron	< 0.2 mg/dm <sup>3</sup>
Manganese	< 0.2 mg/dm <sup>3</sup>
Residue on evaporation	< 500 mg/dm <sup>3</sup>
Potassium permanganate consumption	< 25 mg/dm <sup>3</sup>
	< 3 mg/dm <sup>3</sup>
Suspended matter	> 3 < 15 mg/dm <sup>3</sup> part current purification recommended
	> 15 mg/dm <sup>3</sup> continuous purification recommended

<sup>1)</sup> The complete absence of corrosion under experimental conditions suggests that solutions with a significantly higher salt content and greater corrosion potential (such as seawater) may still be tolerated.

Gypsiferous water is unsuitable for cooling purposes because it has a tendency to form boiler scale, which is particularly difficult to remove. Furthermore, cooling water should be free from iron and manganese, because otherwise deposits may occur which settle in the pipes and block them. At best, organic substances should only be present in small quantities, because otherwise sludge deposits and microbiological contamination may occur.

### 12.1 Preparation and maintenance of the water in recooling systems

Depending on the type of installation to be cooled, certain requirements are placed on the cooling water with respect to purity. According to the level of contamination and the size and design of the recooling systems, a suitable process is used to prepare and/or maintain the water. The most common types of contamination and most



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## 12. Spares list

Position Item Pos. Pos. Pos. Posición 項目	Ersatzteil- liste	Spares list	Liste de pièces détachées	Lijst reserve- delen	Reserv- delslista	Lista dei pezzi di ricambio	Lista de piezas de repuesto	スペア パーツ
	<b>D</b>	<b>GB</b>	<b>F</b>	<b>NL</b>	<b>S</b>	<b>I</b>	<b>E</b>	<b>J</b>
	Bezeichnung	Description	Signification	Benaming	Beteckning	Descrizione	Descripción	製品名
10	Ventilator, komplett	Fan, complete	Ventilateur, complète	Ventilator, kompleet	Fläkt, komplett	Ventilatore, completa	Ventilador, completo	ファン、 一式
15	Zubehörbeutel	Dispatch bag	Pochette d'accessoires	Zakje toebehoren	Tillbehörspåse	Sacchetto accessori	Bolsa de accesorios	アクセサリー バッグ
16	Abdichtplatte	Sealing plate	Plaque d'étanchéité	Afdichtplaat	Tätningssplatta	Piastra di tenuta	Placa de estanqueidad	密閉用プレート
32	Magnetventil, komplett	Solenoid valve, complete	Vanne électroma- gnétique, complète	Magneetventiel, kompleet	Magnetventil, komplett	Valvola elettroma- netica, completa	Electroválvula, completa	マグネットバルブ、 一式
33	Rückschlagventil	Flap valve	Clapet antiretour	Terugstroomventiel	Backventil	Valvola di non ritorno	Válvula de retención	フラップバルブ
35	Zwei-Stufen- Thermostat	Two-stage thermostat	Thermostat à deux paliers	Tweestanden- thermostaat	Tvåstegs- termostat	Termostato a due stadi	Termostato de dos estados	二段階式 サーモスタット
40	Steuerplatine komplett	Control PCB complete	Platine de com- mande, complète	Stuurstrooimprint, kompleet	Styrkort, komplett	Piastra circuito stampate, completa	Pletina de mando completa	コントロールPCB、 一式
48	Luft Eintrittsgitter	Air inlet grille	Grille d'entrée d'air	Luchtinlaatrooster	Luftingångsgaller	Griglia d'entrata dell'aria	Rejilla de entrada de aire	吸気グリッド
71	Temperaturfühler	Temperature sensor	Sonde de température	Temperatuursensor	Temperaturgivare	Sonda di temperatura	Sonda térmica	温度センサー
73	Leckagesensor	Leakage sensor	Palpeur de fuite	Lekkagesensor	Läckagesensor	Rivelatore di perdite	Sensor de fugas de agua	漏水モニター
75	Haube, komplett	Cover, complete	Couvercle, complète	Afdekkap, kompleet	Huv, komplett	Calotta, completa	Cubierta completa	カバー、 一式
91	Wärmetauscher	Heat exchanger	Echangeur thermique	Warmtewisselaar	Värmeväxlare	Scambiatore di calore	Intercambiador de calor	ヒートエクスチェン ジャー
95	Bodenwanne, komplett	Base tray, complete	Bac de rétention, complète	Bodemplaat, kompleet	Bottentråg, komplett	Vaschetta di racc. cond., completa	Bandeja de base completa	ベーストレイ、 一式

Bei Bestellung unbedingt angeben

Typ:

Fabrikations-Nr.:

Herstelldatum:

Ersatzteil-Nr.:

Absolutely necessary in case of order

Type:

Fabrication no.:

Manufacturing date:

Spare part no.:

スペアパーツご発注時に必ずご記入下さい。

クーラー型式:

製造番号:

製造日時:

スペアパーツ番号:

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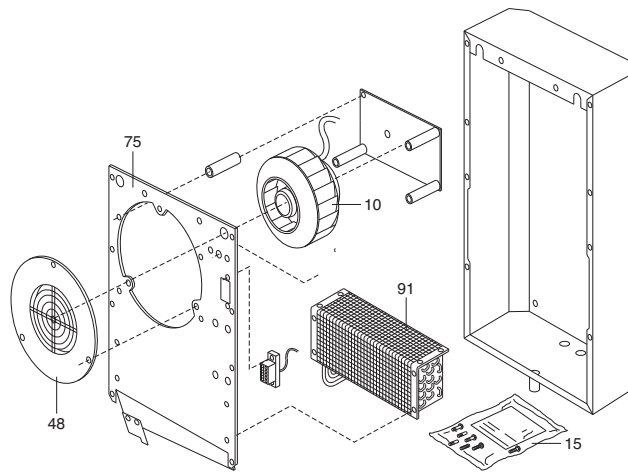
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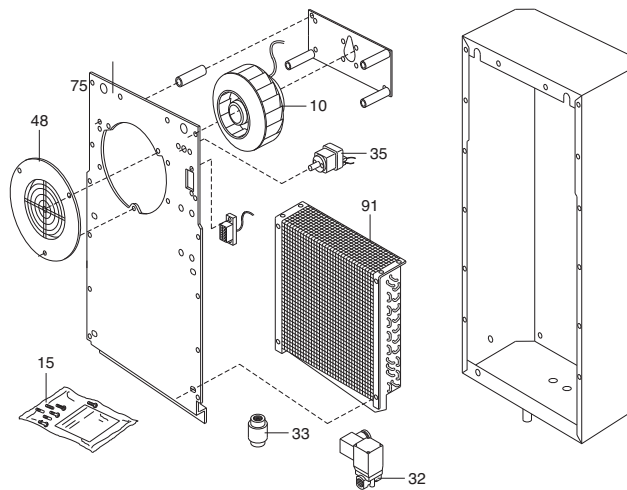
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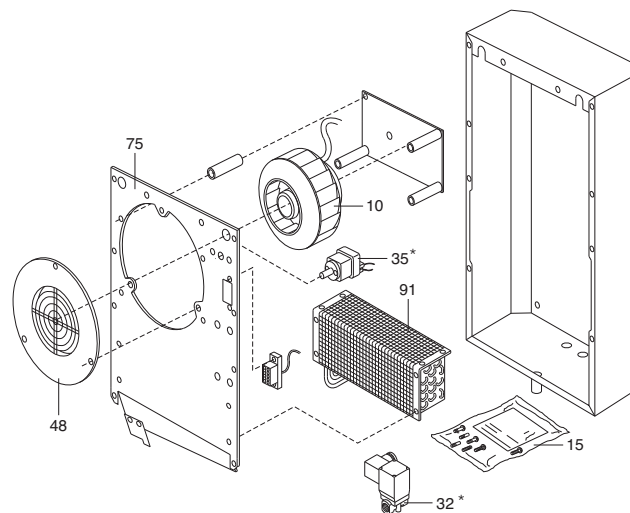
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# SK 3212.230 / SK 3214.100 / SK 3215.100



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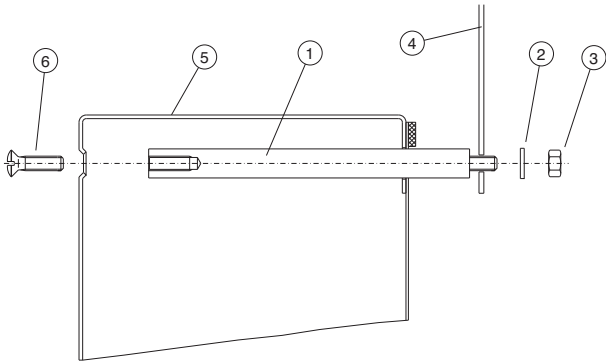
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Geräteanbau  
 External mounting  
 Montage en saillie  
 Apparaatopbouw  
 Påbyggnad  
 Montaggio sporgente  
 Montaje exterior del aparato  
 表面取付け

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Geräteeinbau  
 Internal mounting  
 Montage encastré  
 Apparaatinbouw  
 Inbyggnad  
 Montaggio incassato  
 Montaje interior del aparato  
 全埋め込み取付け

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 SK 3215.100 / SK 3216.480

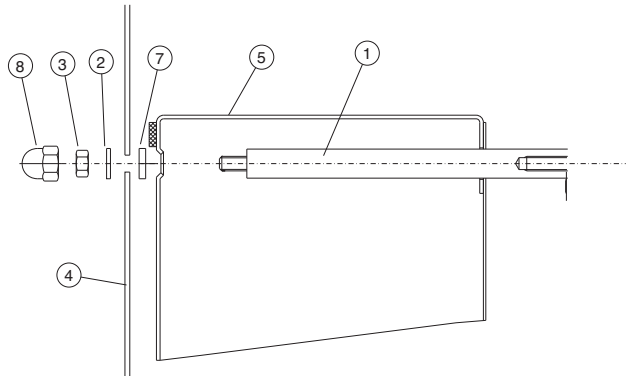
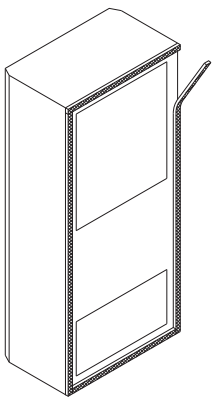


Abb. 3.2 Anbringung der Dichtung  
 Fig. 3.2 Attaching the seal  
 Fig. 3.2 Mise en place du joint  
 Afb. 3.2 Aanbrengen van de afdichting  
 Bild 3.2 Montage av tätning  
 Fig. 3.2 Applicazione della guarnizione  
 Fig. 3.2 Colocación de la junta  
 ☒ 3.2 パッキンの取付

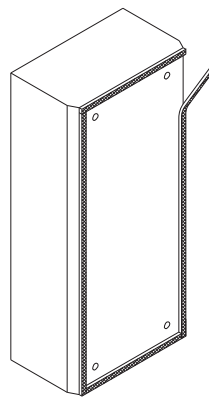
Geräteanbau  
 External mounting  
 Montage en saillie  
 Apparaatopbouw  
 Påbyggnad  
 Montaggio sporgente  
 Montaje exterior del aparato  
 表面取付け

SK 3212.xxx / SK 3214.100 /  
 SK 3215.100 / SK 3216.480



Geräteeinbau  
 Internal mounting  
 Montage encastré  
 Apparaatinbouw  
 Inbyggnad  
 Montaggio incassato  
 Montaje interior del aparato  
 全埋め込み取付け

SK 3212.xxx / SK 3214.100 /  
 SK 3215.100 / SK 3216.480



## SK 3212. 024

Anschlußplan

Wiring diagram

Schéma des connexions

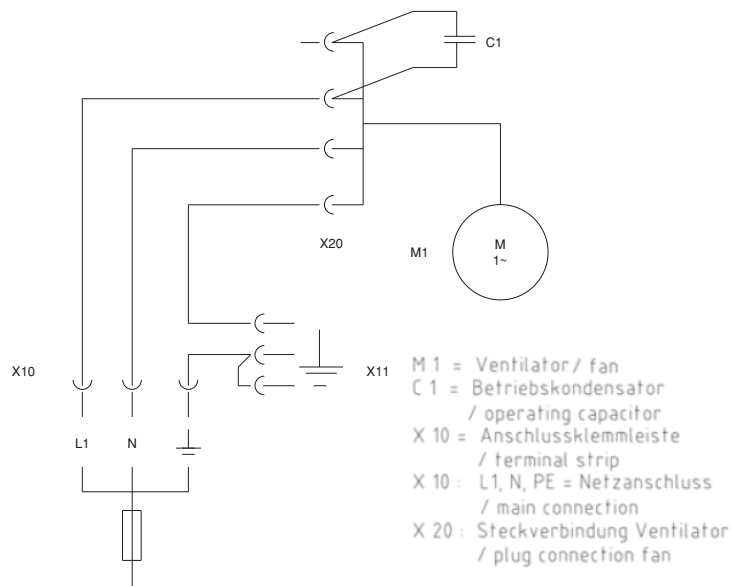
Aansluitschema

Anslutningsdiagram

Schema di allacciamento

Esquema de conexiones

配線図



## SK 3212. 230

Anschlußplan

Wiring diagram

Schéma des connexions

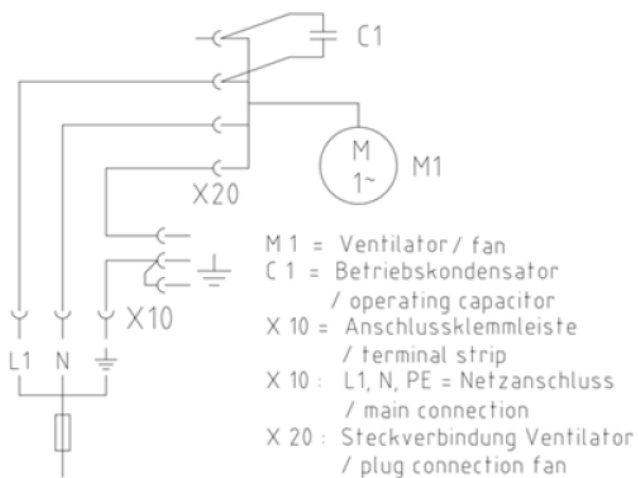
Aansluitschema

Anslutningsdiagram

Schema di allacciamento

Esquema de conexiones

配線図



## SK 3216.480

Anschlußplan

Wiring diagram

Schéma des connexions

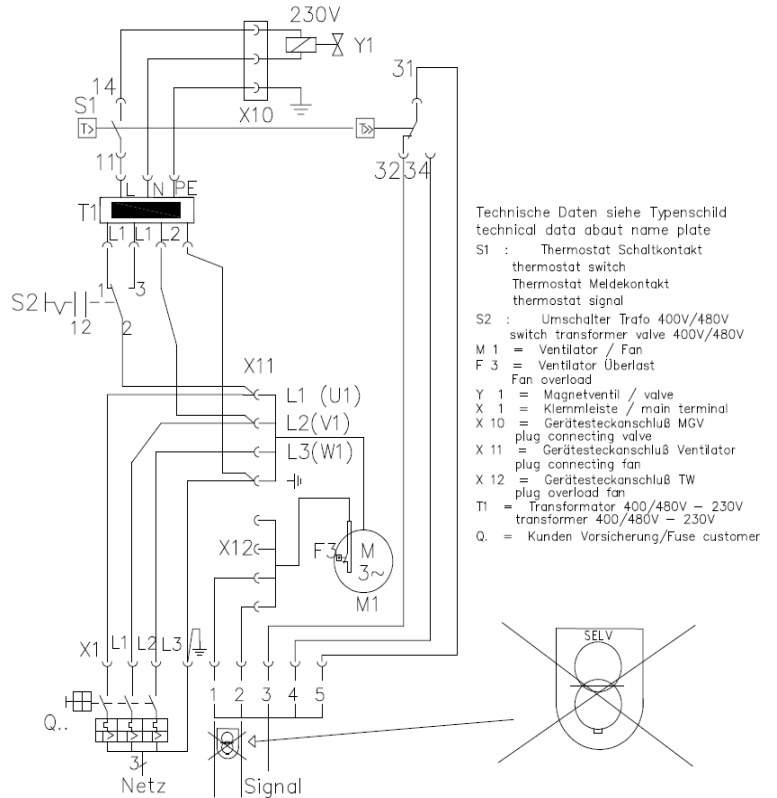
Aansluitschema

Anslutningsdiagram

Schema di allacciamento

Esquema de conexiones

配線図



## SK 3214.100 / SK 3215.100

Wiring diagram

Schéma des connexions

Aansluitschema

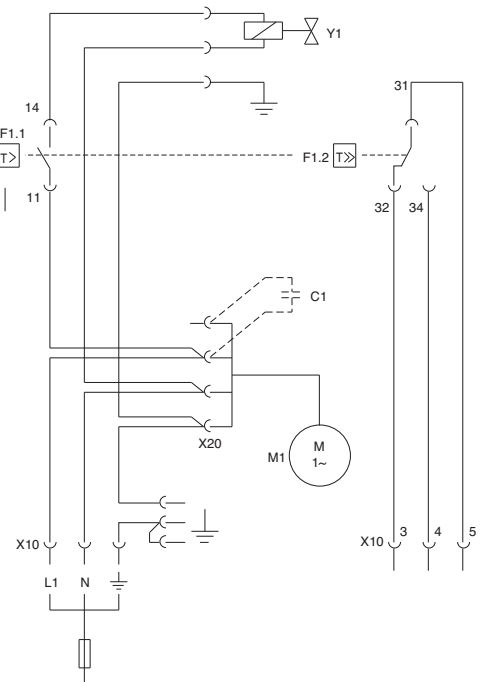
Anslutningsdiagram

Schema di allacciamento

Esquema de conexiones

配線図

Technische Daten siehe Typenschild  
Technical data see name plate  
Données techniques voir plaque signalétique  
Technische gegevens zie typeplaatje  
Tekniska data se typskylten  
Caratteristiche tecniche vedi dati di targa  
Datos técnicos ver placa de características  
仕様については銘板参照



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## D Anschlußschema

A1	= Steuerplatine
B1	= Temperaturfühler
B2	= Leckagefühler
C1	= Betriebskondensator
F1	= Thermostat
F1.1	= Schaltkontakt
F1.2	= Störmeldekontakt
M1	= Ventilator
Y1	= Magnetventil
X1	= Klemmleiste
X10	= Stecker Netzanschluß (schwarz)
X11	= Stecker Sammelmeldestörung (braun)
X12	= Gerätesteckanschluß TW
X20	= Steckverbindung Ventilator
P1	= Sollwert-Potentiometer Schrankinnentemperatur
ABC	= Umschaltung der Betriebsart

## GB Wiring diagram

A1	= Control PCB
B1	= Temperature sensor
B2	= Leak sensor
C1	= Operating capacitor
F1	= Thermostat
F1.1	= Switch contact
F1.2	= Fault signal contact
M1	= Fan
Y1	= Solenoid valve
X1	= Terminal strip
X10	= Mains plug connector (black)
X11	= Collective fault signal plug (brown)
X12	= Unit plug connector TW
X20	= Plug connection fan
P1	= Set-point setter, enclosure internal temperature
ABC	= Changeover of operating mode

## F Schéma électrique

A1	= Platine de commande
B1	= Sonde de température
B2	= Sonde de niveau d'eau
C1	= Condensateur de régime
F1	= Thermostat
F1.1	= Contact de commutation
F1.2	= Contact de signalisation de défaut
M1	= Ventilateur
Y1	= Vanne électromagnétique
X1	= Bornier
X10	= Bornes de raccordement secteur (noir)
X11	= Bornes de raccordement des indications de défaut (brun)
X12	= Connecteur enfichable TW
X20	= Fiche du ventilateur
P1	= Potentiomètre de réglage de la température intérieure de l'armoire
ABC	= Commutation du mode de fonctionnement

## NL Aansluitschema

A1	= Stuurstroomprint
B1	= Temperatuursensor
B2	= Lekkagesensor
C1	= Bedrijfskondensator
F1	= Thermostaat
F1.1	= Schakelaar
F1.2	= Storingsmeldercontact
M1	= Ventilator
Y1	= Magneetventiel
X1	= Klemmenstrook
X10	= Stekker netaansluiting (zwart)
X11	= Stekker verzamelsfoormelding (bruin)
X12	= Connectoraansluiting TW
X20	= Connector voor ventilator
P1	= Temperatuur in kast
ABC	= Omschakeling van bedrijfsstand

## S Anslutningsschema

A1	= Styrkort
B1	= Temperaturavkännare
B2	= Läckageavkännare
C1	= Driftkondensator
F1	= Termostat
F1.1	= Omkopplare
F1.2	= Felmeddelande
M1	= Fläkt
Y1	= Magnetventil
X1	= Klämlist
X10	= Kontakt nätanslutning (svart)
X11	= Kontakt störsignaler (brun)
X12	= Aggregatuttag TW
X20	= Anslutning fläkt
P1	= Apparatskåpets innertemperatur
ABC	= Växling av funktion

## I Schema allacciamenti

A1	= Piastra circuito stampate
B1	= Sonda di temperatura
B2	= Rivelatore (sonda) di perdita
C1	= Condensatore d'esercizio
F1	= Termostato
F1.1	= Contatto degli interruttori di distribuzione
F1.2	= Contatto di segnalazione guasti
M1	= Ventilatore
Y1	= Valvola elettromagnetica
X1	= Morsettiera
X10	= Spina allacciamento rete (nero)
X11	= Spina circuito de segnalazione (marrone)
X12	= Allacciamento apparecchio TW
X20	= Connettore per ventilatore
P1	= Regolazione della temperatura interna
ABC	= Commutazione del tipo esercizio

## E Esquema de conexiones

A1	= Platina de mando
B1	= Sensor de temperatura
B2	= Sensor de fugas
C1	= Condensador de servicio
F1	= Termostato
F1.1	= Contacto de conexión
F1.2	= Contacto de aviso de avería
M1	= Ventilador
Y1	= Válvula electromagnética
X1	= Regleta de bornes
X10	= Enchufe alimentación de red (negro)
X11	= Enchufe aviso de avería colectiva (marrón)
X12	= Conexión de enchufe del aparato TW
X20	= Conexión ventilador
P1	= Valor teórico potenciometro temperatura interior armario
ABC	= Conmutación de la clase de servicio

## J 配線図

A1	= 制御PCB
B1	= 温度センサー
B2	= 漏水センサー
C1	= 操作用コンデンサー
F1	= サーモスタット
F1.1	= スイッチ接点
F1.2	= エラー信号接点
M1	= ファン
Y1	= マグネットバルブ
X1	= ターミナルストリップ
X10	= 電源プラグ (黒)
X11	= 集合故障信号プラグ (茶)
X12	= ユニットプラグコネクタ TW
X20	= プラグ接続式ファン
P1	= 設定値ポテンシャルメータ エンクローチャー内部温度用
ABC	= 運転モード切替

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### Kennlinienfeld (DIN 3168)

#### Performance diagram

#### Diagramme aéraulique

#### Karakteristiek

#### Karakteristik kurva

#### Diagramma delle curve caratteristiche

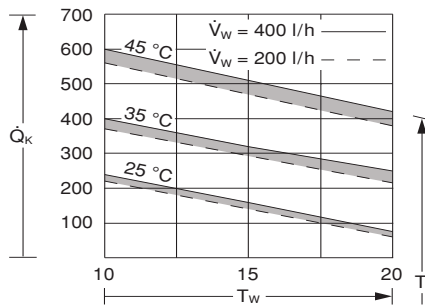
#### Diagrama de potencia

#### 動作性能表

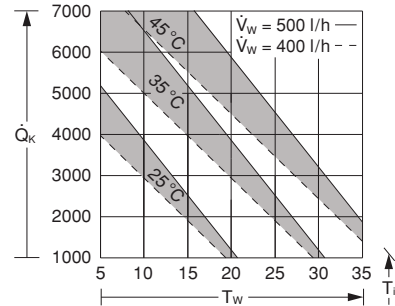
- $\dot{Q}_k$  = Dauer-Nutzkühlleistung [W]  
 Continuous useful cooling output  
 Puissance frigo. en régime permanent  
 Nuttig koelvermogen  
 Kyleffekt  
 Potenza frigorifera utile  
 Potencia útil de refrigeración  
 冷却能力
- $T_i$  = Schaltschrank-Innentemperatur [°C]  
 Enclosure internal temperature  
 Température à l'intérieur de l'armoire  
 Temperatuur in de kast  
 Temperatur inne i skåpet  
 Temperatura interna dell'armadio  
 Temperatura interior armario  
 エンクロージャー内部温度
- $T_w$  = Wassereintrittstemperatur [°C]  
 Water inlet temperature  
 Température de l'eau à l'entrée  
 Waterinlaattemperatuur  
 Vattnets ingångstemperatur  
 Temperatura d'ingresso dell'acqua  
 Temperatura de entrada del agua  
 注入時水温

- $\dot{V}$  = Volumenstrom [l/h]  
 Volume flow  
 Débit d'air  
 Volumestroom  
 Volymström  
 Portata  
 Caudal volumétrico  
 水量
- $\Delta P$  = Wasserwiderstand [m/bar]  
 Water resistance  
 Résistance hydraulique  
 Waterweerstand  
 Vattenmotstånd  
 Resistenza dell'acqua  
 Resistencia del agua  
 耐水压

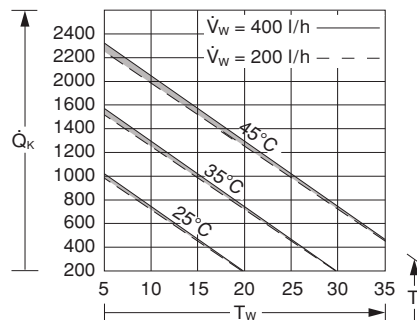
### Kennlinienfeld SK 3212.xxx (DIN 3168) (50/60 Hz)



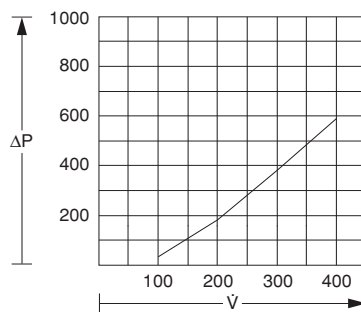
### Kennlinienfeld SK 3216.480 (DIN 3168) (50/60 Hz)



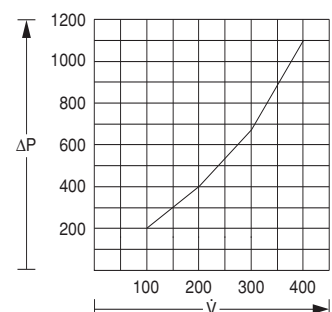
### Kennlinienfeld SK 3215.100 (DIN 3168) (50/60 Hz)



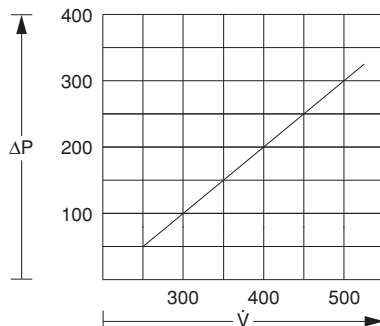
### Wasserwiderstandskennlinie SK 3212.xxx



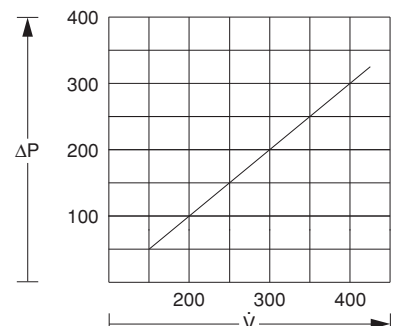
### Wasserwiderstandskennlinie SK 3216.480



### Wasserwiderstandskennlinie SK 3214.100



### Wasserwiderstandskennlinie SK 3215.100



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