

## Technical parameters

### IKW – water cooler

- is intended for square pipes in connection with DIRECT AIR units
- the casing of the water cooler is made of galvanized sheet metal
- aluminum slats on copper tubes
- the connection is by soldering
- the cooler contains a drip eliminator

### Installation and operation

- during assembly, it is necessary to remember to drain and fill the system and ensure access for service, including venting
- coolers can only be installed indoors (in a place where the temperature is permanently above 0 °C)
- mounting exclusively in a horizontal position
- an air filter must be installed in front of the cooler (protection against pollution)
- we recommend placing the cooler behind the heater
- as part of the projection, the cooler must be designed with regard to the amount of condensate generated
- the air velocity in the pipeline must not exceed 4 m/s, otherwise it is necessary to add another droplet eliminator after consultation with the EDV technical department
- the condensate drain with the odor siphon must be checked for the possibility of drying out and ensure a sufficient height of the water column to overcome the pressure loss of the siphon

Type	A	B	C	D	E	F
IKW 200	400	200	230	515	400	300
IKW 225	500	250	230	615	450	350
IKW 250	500	300	250	615	500	400
IKW 285	600	300	250	715	500	400
IKW 315	600	350	300	715	550	450
IKW 355	700	400	350	815	600	500
IKW 400	800	500	450	915	700	600
IKW 450	1,000	500	450	1,115	700	600

- to determine the minimum safe level difference in the siphon, you can roughly proceed by taking the total fan pressure Pt in mm of the water column, this value will be increased by approx. 50 % (the value thus obtained represents a practical recommended value for the height of the water column in the siphon, so that it cannot the odor barrier is overcome by overpressure blowing or suction by vacuum fan)
- passing air must not contain solid, fibrous, sticky and aggressive additives. It must also be free of chemical substances that cause corrosion of the materials used, i.e. destroy aluminum, copper and zinc
- to reduce pressure losses (and thereby reduce operating costs), we recommend using coolers with air bypass around the evaporator (type IKWxxBP)
- the radiator is connected to the source using an insulated copper pipe
- based on consultation with the technical department, it is possible to offer a suitable source of cold

### Notice

The cooler must be installed in the duct route with the air flow in the direction of the arrow on the cooler case. If the cooler is mounted upside down, the condensate is not led into the receiver and flows out of the cooler.

For the reliable operation of the cooler, it is necessary to ensure protection against freezing or power regulation (defrost cycle). In the order, it is necessary to state the request for right or left version.

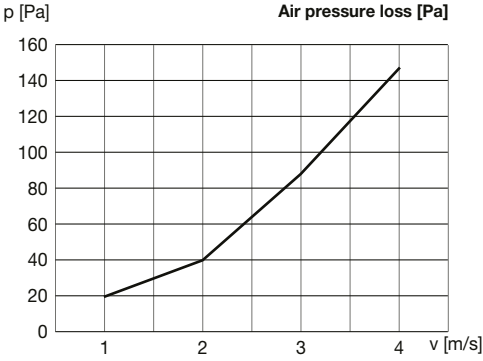
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Type	for fans IRT/IRB	max. výkon [kW]	flow [m <sup>3</sup> /h]	weight		Ø piping Cu [mm]	regulator	piping sensor	antifreeze protection
				IKW [kg]	IKW BP [kg]				
IKW 200	200	5.4	763	9.85	11.97	22	Digireg®	TGCU	THE, F2000
IKW 225	225	8.1	1152	12.71	15.17	22	Digireg®	TGCU	THE, F2000
IKW 250	250	9.7	1382	14.38	16.93	22	Digireg®	TGCU	THE, F2000
IKW 285	285	11.5	1627	16.80	19.70	28	Digireg®	TGCU	THE, F2000
IKW 315	315	12.0	1800	20.40	23.70	28	Digireg®	TGCU	THE, F2000
IKW 355	355	17.5	2484	26.05	30.14	28	Digireg®	TGCU	THE, F2000
IKW 400	400	25.6	3636	37.14	42.61	35	Digireg®	TGCU	THE, F2000
IKW 450	450	33.4	4460	43.11	49.60	35	Digireg®	TGCU	THE, F2000

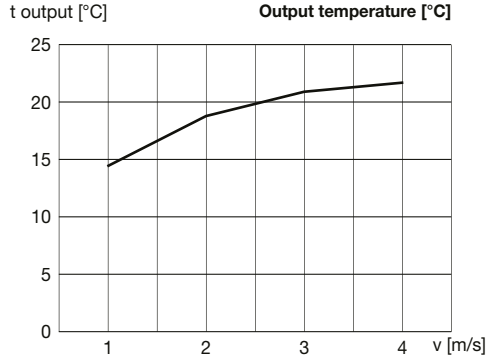
performance values apply to supply air 32 °C, RH 40%, water temperature drop 6/12 °C, front speed 4 m/s

Characteristics

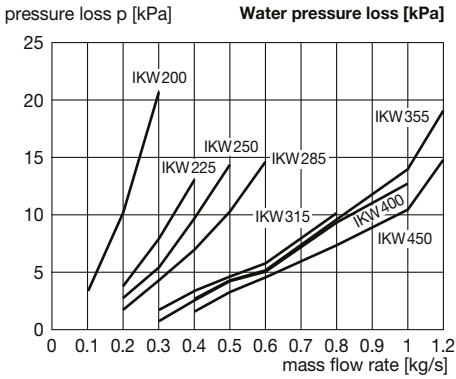
Pressure loss of water coolers IKW 200 to IKW 450



Dependence of the outlet air temperature on the air flow rate on the air side



Water pressure loss [kPa]



Supplementary image

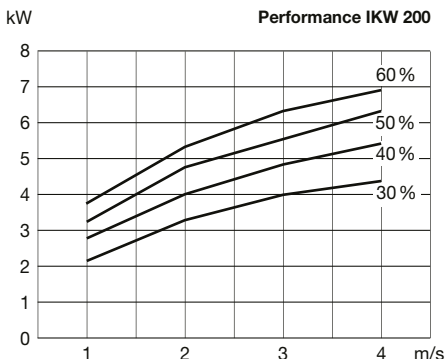


IKW without bypass valve

## Characteristics

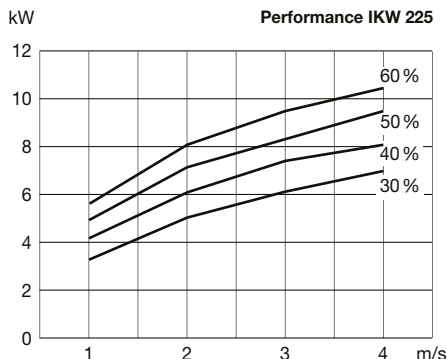
**Cooling capacity IKW 200 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed [m/s]	x [g/kg]	9	12.1	15.2	18.3
	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.096	2.2	2.7	3.2	3.7
2	0.192	3.3	4.0	4.7	5.3
3	0.288	4.0	4.8	5.5	6.3
4	0.384	4.4	5.4	6.2	6.9



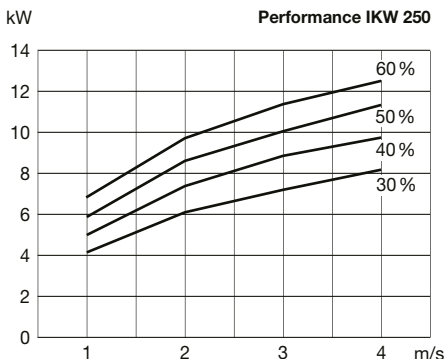
**Cooling capacity IKW 225 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed [m/s]	x [g/kg]	9	12.1	15.2	18.3
	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.15	3.4	4.2	4.9	5.6
2	0.3	5	6.1	7.1	8.1
3	0.45	6.1	7.3	8.4	9.5
4	0.6	6.8	8.1	9.4	10.5



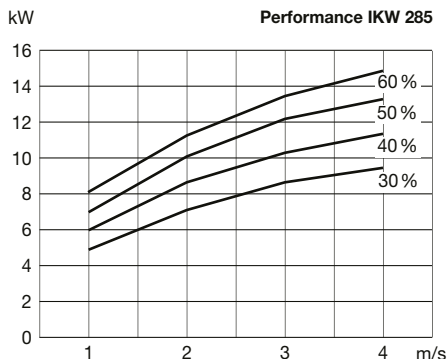
**Cooling capacity IKW 250 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed [m/s]	x [g/kg]	9	12.1	15.2	18.3
	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.18	4.1	5	5.9	6.8
2	0.36	6.1	7.3	8.6	9.7
3	0.54	7.3	8.8	10.1	11.4
4	0.72	8.2	9.8	11.3	12.6



**Cooling capacity IKW 285 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed [m/s]	x [g/kg]	9	12.1	15.2	18.3
	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.216	4.9	6	7	8
2	0.432	7.2	8.7	10.1	11.4
3	0.648	8.6	10.3	11.9	13.5
4	0.864	9.6	11.5	13.3	14.9

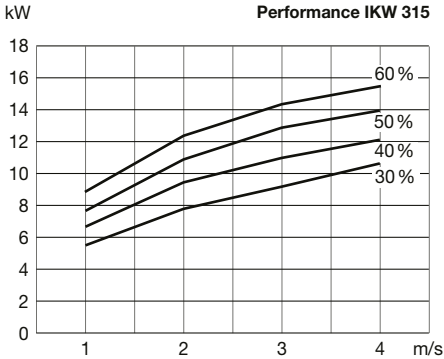


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**Characteristics**

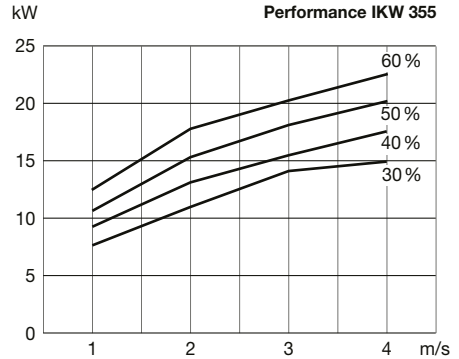
**Cooling capacity IKW 315 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed	x [g/kg]	9	12.1	15.2	18.3
[m/s]	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.252	5.4	6.6	7.7	8.8
2	0.504	7.8	9.3	10.8	12.3
3	0.756	9.1	10.9	12.7	14.3
4	1.008	10.5	12.1	13.9	15.6



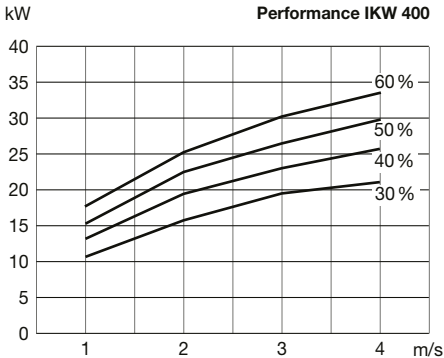
**Cooling capacity IKW 355 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed	x [g/kg]	9	12.1	15.2	18.3
[m/s]	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.336	7.6	9.3	10.9	12.4
2	0.672	11.1	13.4	15.6	17.7
3	1.008	14.3	15.9	18.3	20.7
4	1.344	14.9	17.6	20.4	22.8



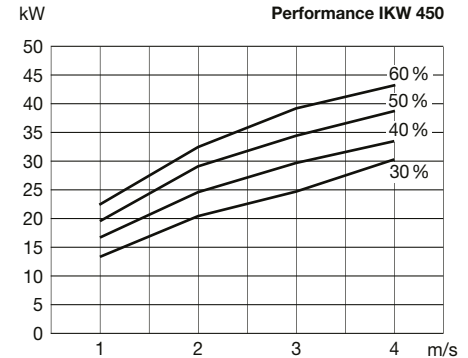
**Cooling capacity IKW 400 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed	x [g/kg]	9	12.1	15.2	18.3
[m/s]	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.48	10.9	13.2	15.5	17.7
2	0.96	16	19.3	22.5	25.5
3	1.44	19.2	23.1	26.7	30.2
4	1.92	21.2	25.9	29.8	33.5



**Cooling capacity IKW 450 (kW) on the air side**  
(parameter is air humidity)

RV (%) at 32 °C		RV 30%	RV 40%	RV 50%	RV 60%
Front speed	x [g/kg]	9	12.1	15.2	18.3
[m/s]	m [kg/s]	performance [kW]	performance [kW]	performance [kW]	performance [kW]
1	0.6	13.8	16.8	19.7	22.5
2	1.2	20.5	24.8	28.9	32.7
3	1.8	24.9	29.7	34.5	39
4	2.4	30.7	33.6	38.6	43.4



### ■ Use and operating conditions

Water coolers, type designation IKW, are intended for air cooling in air conditioning equipment.

They are designed for direct installation in pipe systems (so-called zone coolers). The radiator is connected to the cold source using an insulated pipe (copper, plastic, steel). Determination of performance or the type of exchanger can best be determined using the previously mentioned graphs. After consultation with the technical department, it is possible to offer cooling sources.

The cooling performance is regulated by regulating the flow of cold water through the mixing nodes for water cooling (ESUCH). The passing air must not contain solid, fibrous, sticky, aggressive additives. It must also be free of chemical substances that cause corrosion of the materials used, i.e. destroy aluminum, copper and zinc. Permitted water operating parameters for the cooler:

minimum chilled water temperature: 5 °C  
 maximum permitted water pressure: 2.5 Mpa (25 Bar) for temperatures up to 20 °C optimal temperature gradient of the cooling water: 6 °C/12 °C

### ■ Technical parameters

When designing the location of the cooler, we recommend following the following principles: Coolers can only be installed indoors, i.e. in a place where the temperature around the cooler does not drop below the freezing point. Antifreeze mixtures (e.g. ethylene glycol solution) can also be used as a cooling liquid. They have a lower specific heat than water, so a relatively larger flow rate is required to transmit comparable power.

The coolers must be mounted in a horizontal position and their ventilation must be ensured.

The cooler must be located to provide access for service.

An air filter must be installed in front of the cooler to protect it from contamination.

Maximum performance is achieved by the cooler, which is connected as counter-flow. We recommend placing the cooler behind the heater. To reduce pressure losses (and thereby reduce operating costs), we recommend using coolers with a bypass (type IKW, BP); in the period when it is not cooling, the air goes outside the cooler and thus the pressure losses will decrease for the same air flow. This makes it possible to reduce the power of the fans, which will subsequently reduce operating costs (financial savings).

### ■ Dimensions and material

Water coolers come in eight sizes. The connection on the air side is standard with dimensions W x H. The connection on the water side is a copper pipe with a diameter of 22, 28 or 35 mm. Coolers are characterized by the similarity of thermodynamic parameters in all dimensions. They thus make it possible to cover the entire range of air flows with identical pressure loss characteristics. The

casing of the coolers is made of galvanized sheet metal. Collectors are made of copper pipes. The heat exchange surface consists of aluminum lamellas with a thickness of 0.25 mm, which are pressed onto copper pipes with an overlap.

The coolers are three-row. The materials used are carefully checked, checked and guarantee long-term durability and reliability. All coolers are tested for tightness with nitrogen at a pressure of 2 Mpa in a water bath at a temperature of 40 °C for 15 minutes.

### ■ Accessories and venting

Water coolers work reliably only when they are supplemented with accessories that provide the necessary functions – venting, frost protection and performance regulation. Since the cooler is most often installed in difficult-to-access places in heights or soffits, we recommend automatic venting. The automatic valve is screwed into the socket at the highest point of the heating circuit. The valve must never be installed upside down! Important! If you use the TACO valve, Hydrazine max can be used as a water additive. 5 mg/l or ethylene glycol max. 50 % For other types of additives, a consultation with the supplier is required on the compatibility of additives with swelling rings (inserts).

### ■ Frost protection

In normal use, we must ensure the protection of the radiator against freezing in winter. At this time, the cooling source is shut down. The air bypass around the exchanger is open, which reduces cooling by the inlet air. We have to distinguish between two applications – with the preceding VO and with the use of EO. With the correct VO design, anti-freeze protection is also ensured, which ensures that the temperature behind the heater does not drop below 5 °C. Subsequently, the protection of the water cooler is also ensured.

For the variant with EO, we ensure the protection of the water cooler against freezing by monitoring the temperature behind the EO using sensor B2. The control system ensures that when the temperature drops below 15 °C, the PMO function is triggered (closing the inlet flap KL1 and turning off the fans V1 and V2).

### ■ Notice

If there is a network failure, the water exchangers are not protected. Due to the high thermal conductivity and low water content, the cooler can freeze at low inlet air temperatures and subsequently crack within a few tens of seconds. In areas with strong frosts, it is necessary to use a tight flap with a safety function at the entrance, which is equipped with a servo drive with a return spring. In the event of a mains failure, the servo drive automatically closes the flap and thus reduces the risk of freezing. The most suitable types of servo motors are BELIMO-SF24A or LF24.

When ordering, it must be stated whether

you require a LEFT or RIGHT version. The design is understood according to the direction of the outlets when looking at the slats in the direction of the air flow.

### ■ Installation and maintenance

The installation must be carried out on the basis of a professional project by a qualified designer who is responsible for the correct selection of the cooler and accessories. Installation and commissioning may only be carried out by a professional assembly (or electrical assembly) company authorized in accordance with generally applicable regulations.

The device must be carefully inspected before installation. In particular, it is necessary to check whether some parts are not damaged, whether the pipes, lamellas and collectors of the radiator, the insulation of the pump wires and the servo motor of the mixing unit are in order. When cooling is carried by water, coolers and nodes can only be installed in an indoor environment where the ambient temperature does not drop below freezing. It is advisable to place the mixing unit near the water cooler so that both elements can be connected with the supplied flexible hoses.