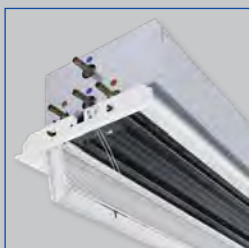


Induction units for suspended ceilings

Type DID312



DID312-LR, with hinged down induced air grille



Water connection



Eurovent certification



Tested to VDI 6022



Active chilled beam with two-way air discharge, 300 mm nominal width, vertical heat exchanger and condensate drip tray

Active chilled beam for heating and cooling, with 2-pipe or 4-pipe heat exchanger, for integration with various ceiling systems. The condensate drip tray is useful if the temperature temporarily falls below the dew point.

- Preferably for room heights up to 4.00 m
- High heating and cooling capacity with a low conditioned primary air volume flow rate and low sound power level
- High comfort levels due to low airflow velocity in the occupied zone
- Three nozzle variants to optimise induction based on demand
- Hinged, removable induced air grille in four designs

Optional equipment and accessories

- Control system
- Additional casing for extract air
- Heat exchanger powder-coated black
- Powder coating in many different colours, e.g. RAL CLASSIC

Type		Page
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Application

Application

- Active chilled beams of Type DID312 for the integration into various ceiling systems, preferably for room heights up to 4.00 m
- The vertical heat exchangers and the condensate drip tray are useful if the temperature temporarily falls below the dew point.
- 2-pipe or 4-pipe heat exchangers enable good comfort levels with a low conditioned primary air volume flow rate
- Energy-efficient solution since water is used for heating and cooling

- The vertical heat exchanger with condensate drip tray is useful if the temperature temporarily falls below the dew point
- Hinged, removable induced air grille in four designs
- Heat exchanger as 2-pipe or 4-pipe system
- Internal nozzle plate with punched nozzles (non-combustible)
- Water connection at the narrow side, Ø12 mm Cu pipe, either with plain tails or with G½" external thread and flat seal

Special characteristics

Nominal sizes

- 900, 1200, 1500, 1800, 2100, 2400, 2700, 3000 mm

Description

Variants

- DID312-LR: With induced air grille – perforated sheet metal, circular holes
- DID312-LQ: With induced air grille – perforated sheet metal, square holes
- DID312-GL: With induced air grille – longitudinal blades
- DID312-GQ: With induced air grille – transverse blades

Heat exchanger

- 2: 2-pipe systems
- 4: 4-pipe systems

Nozzle variants

- Z: Small plus
- M: Medium
- G: Large

Construction

- Powder-coated RAL 9010, pure white, gloss level 50 %
- P1: Powder-coated in any other RAL colour, gloss level 70 %
- P1: Powder-coated RAL 9006, white aluminium, gloss level 30 %

Attachments

- Additional casing for extract air, with side spigot
- Water connection A1: G½" external thread and flat seal
- Water connection A2: G½" union nut and flat seal

Useful additions

- Connecting hoses
- Control equipment consisting of a control panel including a controller with integral room temperature sensor; valves and valve

- actuators; and lockshields
- X-AIRCONTROL control system

Construction features

- Spigot is suitable for circular ducts to EN 1506 or EN 13180
- 4 or 6 suspension points for on-site installation (by others)
- Three nozzle variants to optimise induction based on demand
- Optional extract air spigot on the same side as the primary air spigot or opposite
- Condensate drip tray including condensate drain that can be connected to a condensate pipe (Ø12 mm, to be provided by others)

Materials and surfaces

- Casing, front frame, nozzle plate, and perforated induced air grille (LR/LQ) made of galvanised sheet steel
- Border and blades of the induced air grille (GL/GQ) made of aluminium sections
- Heat exchanger with copper tubes and

aluminium fins

- Exposed surfaces are powder-coated pure white (RAL 9010) or in any other RAL colour
- Heat exchanger also in black (RAL 9005)
- Nozzle plate powder-coated black (RAL 9005)
- Additional casing for extract air with a spigot made of galvanised sheet steel

Standards and guidelines

- Products are certified by Eurovent (no. 09.12.432) and listed on the Eurovent website
- Declaration of hygiene conformity to VDI 6022

Maintenance

- No moving parts, hence low maintenance
- The heat exchanger can be vacuumed with an industrial vacuum cleaner if necessary
- VDI 6022, Part 1, applies (Hygiene requirements for ventilation and air-conditioning systems and units)

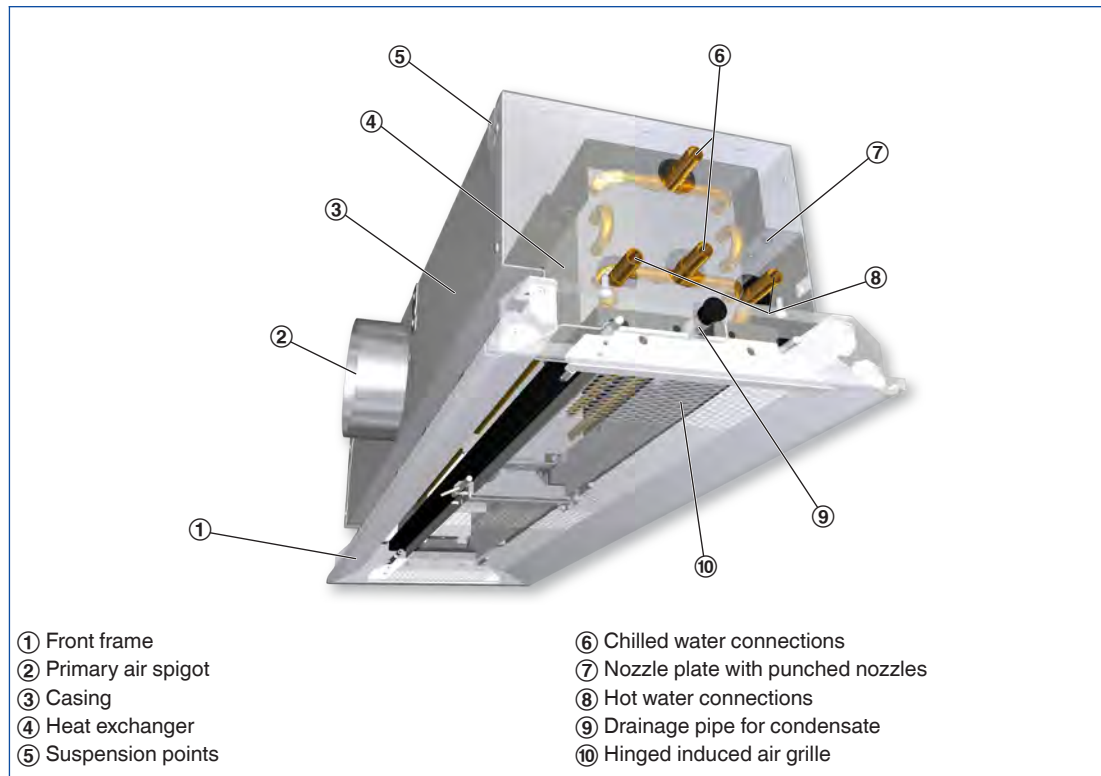
Functional description

Active chilled beams provide centrally conditioned primary air (fresh air) to the room and use heat exchangers for additional cooling and/or heating. The primary air is discharged through nozzles into the mixing chambers; as a result of this,

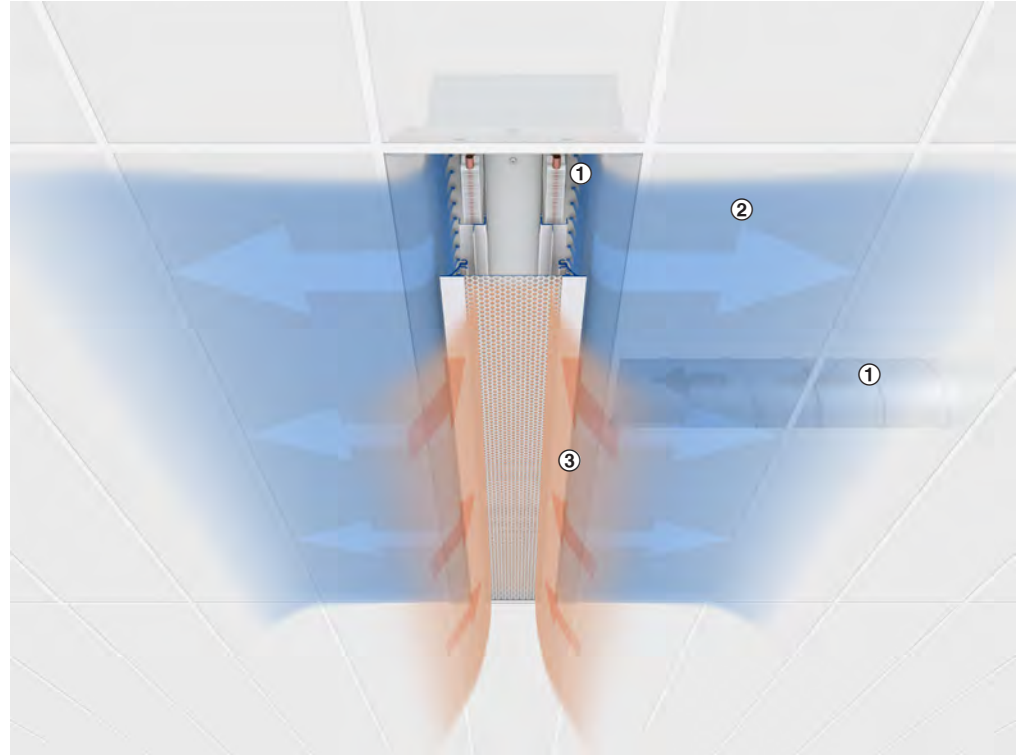
secondary air (room air) is induced via the induced air grille and passes through the heat exchanger.

Primary and secondary air mix and are then supplied to the room horizontally through the supply air slots.

Schematic illustration of DID312



Principle of operation – DID312



- ① Conditioned fresh air (primary air)
- ② Supply air

- ③ Room air (secondary air)

Nominal length	900, 1200, 1500, 1800, 2100, 2400, 2700, 3000 mm
Length	893 – 3000 mm
Height	210/241 mm
Width	293, 300, 312 mm
Primary air spigot, diameter	123/158 mm
Primary air volume flow rate	5 – 70 l/s or 18 – 252 m ³ /h
Cooling capacity	Up to 1830 W
Heating capacity	Up to 1240 W
Max. operating pressure, water side	6 bar
Max. operating temperature	75 °C

The quick sizing table contains operating points for defined reference units. For other operating points you may use the Easy Product Finder design software.

Quick sizing

L _N	①	Primary air			② L _{WA} dB(A)	Cooling				Heating		
		V _{Pr} l/s	m ³ /h	Δp _t Pa		2-pipe and 4-pipe systems				4-pipe system		
						Q _{tot} W	Q _{WK} W	Δt _w K	Δp _w kPa	Q _{WH} = Q _{tot} W	Δt _w K	Δp _w kPa
900	Z	5	18	55	23	267	207	1.2	1.6	327	4.7	0.3
		7	25	108	31	342	258	1.5	1.6	372	5.3	0.3
		10	36	220	41	431	311	1.8	1.6	418	6.0	0.3
	M	7	25	44	21	289	205	1.2	1.6	304	4.4	0.3
		11	40	109	33	413	281	1.6	1.6	361	5.2	0.3
		16	58	231	43	534	341	2.0	1.6	407	5.8	0.3
	G	13	47	45	23	398	241	1.4	1.6	334	4.8	0.3
		21	76	116	36	569	316	1.8	1.6	396	5.7	0.3
		25	90	165	40	644	342	2.0	1.6	418	6.0	0.3
1200	Z	6	22	47	21	322	250	1.4	1.8	416	6.0	0.3
		10	36	129	35	475	354	2.0	1.8	504	7.2	0.3
		15	54	240	45	613	433	2.5	1.8	571	8.2	0.3
	M	9	32	43	22	369	260	1.5	1.8	397	5.7	0.3
		15	54	120	35	556	375	2.1	1.8	482	6.9	0.3
		21	76	235	44	699	446	2.6	1.8	536	7.7	0.3
	G	16	58	42	23	494	301	1.7	1.8	429	6.2	0.3
		23	83	86	33	654	377	2.2	1.8	491	7.0	0.3
		30	108	146	40	792	430	2.5	1.8	535	7.7	0.3
1500	Z	8	29	48	23	421	324	1.9	2.1	526	7.5	0.4
		11	40	91	31	537	405	2.3	2.1	593	8.5	0.4
		16	58	193	41	687	494	2.8	2.1	668	9.6	0.4
	M	11	40	39	21	446	313	1.8	2.1	485	7.0	0.4
		18	65	103	34	666	449	2.6	2.1	585	8.4	0.4
		26	94	215	43	857	543	3.1	2.1	655	9.4	0.4
	G	21	76	45	25	636	383	2.2	2.1	539	7.7	0.4
		29	104	86	34	814	465	2.7	2.1	605	8.7	0.4
		38	137	148	41	989	530	3.0	2.1	658	9.4	0.4
1800	Z	9	32	42	21	472	363	2.1	2.3	603	8.6	0.5
		16	58	131	36	724	531	3.0	2.3	740	10.6	0.5
		19	68	185	41	807	577	3.3	2.3	779	11.2	0.5
	M	14	50	43	23	557	389	2.2	2.3	587	8.4	0.5
		23	83	117	36	824	547	3.1	2.3	701	10.0	0.5
		35	126	270	47	1090	668	3.8	2.3	791	11.3	0.5
	G	25	94	52	27	774	460	2.6	2.3	642	9.2	0.5
		34	122	88	34	950	540	3.1	2.3	705	10.1	0.5
		41	148	128	39	1087	592	3.4	2.3	747	10.7	0.5

① Nozzle variant

② Air-regenerated noise

Reference values

Parameter	Cooling	Heating
t _R	26 °C	22 °C
t _{Pr}	16 °C	22 °C (isothermal)
t _{wv}	16 °C	50 °C
V _w (L _N 900 – 1800)	150 l/h	60 l/h
V _w (L _N 2100 – 3000)	220 l/h	90 l/h

Quick sizing

L _N	①	Primary air			②	Cooling				Heating		
		V̇ _{Pr}	m ³ /h	Δp _t		L _{WA}	2-pipe and 4-pipe systems				4-pipe system	
					l/s		Pa	dB(A)	Q̇ _{tot}	Q̇ _{WK}	Δt _w	Δp _w
		W	K	kPa		W			K	kPa		
2100	Z	11	40	44	25	583	451	1.8	5.2	747	7.1	1.1
		17	61	104	36	814	509	2.4	5.2	880	8.4	1.1
		21	76	159	42	935	682	2.7	5.2	942	9.0	1.1
	M	16	58	39	25	648	455	1.8	5.2	706	6.7	1.1
		26	94	102	37	963	649	2.5	5.2	848	8.1	1.1
		36	130	195	46	1205	770	3.0	5.2	939	9.0	1.1
	G	31	112	45	29	935	562	2.2	5.2	788	7.5	1.1
		42	151	83	37	1180	673	2.6	5.2	878	8.4	1.1
		58	209	158	45	1485	786	3.1	5.2	971	9.3	1.1
2400	Z	12	43	41	25	634	489	1.9	5.6	826	7.9	1.3
		18	65	93	35	873	656	2.6	5.6	964	9.2	1.3
		23	83	152	42	1029	751	2.9	5.6	1043	10.0	1.3
	M	19	68	44	27	761	532	2.1	5.6	809	7.7	1.3
		28	101	95	37	1043	705	2.8	5.6	935	8.9	1.3
		36	130	156	43	1245	811	3.2	5.6	1013	9.7	1.3
	G	35	126	48	30	1050	628	2.5	5.6	884	8.4	1.3
		48	173	90	38	1338	757	3.0	5.6	987	9.4	1.3
		60	216	140	44	1568	844	3.3	5.6	1058	10.1	1.3
2700	Z	13	47	39	24	683	526	2.1	6.1	907	8.7	1.4
		20	72	92	35	964	722	2.8	6.1	1070	10.2	1.4
		25	90	143	41	1119	818	3.2	6.1	1147	11.0	1.4
	M	20	72	39	26	798	556	2.2	6.1	876	8.4	1.4
		29	104	82	35	1082	742	2.9	6.1	1009	9.6	1.4
		39	140	148	43	1350	879	3.4	6.1	1114	10.6	1.4
	G	38	137	47	30	1138	680	2.7	6.1	972	9.3	1.4
		52	187	88	38	1449	822	3.2	6.1	1085	10.4	1.4
		63	227	129	43	1664	904	3.5	6.1	1149	11.0	1.4
3000	Z	15	54	42	26	778	597	2.3	6.5	1002	9.6	1.5
		21	76	83	34	1018	764	3.0	6.5	1137	10.9	1.5
		27	97	136	41	1207	881	3.4	6.5	1233	11.8	1.5
	M	20	72	32	24	791	550	2.2	6.5	914	8.7	1.5
		32	115	82	36	1195	809	3.2	6.5	1097	10.5	1.5
		41	148	135	42	1428	934	3.6	6.5	1188	11.4	1.5
	G	45	152	56	33	1320	777	3.0	6.5	1081	10.3	1.5
		58	209	94	39	1600	901	3.5	6.5	1179	11.3	1.5
		70	252	136	44	1831	987	3.9	6.5	1248	11.9	1.5

① Nozzle variant

② Air-regenerated noise

Reference values

Parameter	Cooling	Heating
t _R	26 °C	22 °C
t _{Pr}	16 °C	22 °C (isothermal)
t _{WV}	16 °C	50 °C
V̇ _w (L _N 900 – 1800)	150 l/h	60 l/h
V̇ _w (L _N 2100 – 3000)	220 l/h	90 l/h

Aerodynamic data - extract air	Aerodynamic data - extract air		
\dot{V}_{Ext} l/s	\dot{V}_{Ext} m ³ /h	Δp_t Pa	L_{WA} dB(A)
5	18	1	<10
10	36	3	<10
15	54	7	<10
20	72	12	15
25	90	18	23
30	108	26	30
35	126	35	35
40	144	46	39
45	162	58	43
50	180	72	47

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Description

Active chilled beams of Type DID312, with two-way air discharge and high thermal output, providing high thermal comfort levels. For installation flush with the ceiling, preferably in rooms with a height up to 4.00 m. The units consist of a casing with suspension points, a spigot, non-combustible nozzles, and two vertical heat exchangers. Three nozzle variants to optimise induction based on demand.

Special characteristics

- The vertical heat exchanger with condensate drip tray is useful if the temperature temporarily falls below the dew point
- Hinged, removable induced air grille in four designs
- Heat exchanger as 2-pipe or 4-pipe system
- Internal nozzle plate with punched nozzles (non-combustible)
- Water connection at the narrow side, $\varnothing 12$ mm Cu pipe, either with plain tails or with G $\frac{1}{2}$ " external thread and flat seal

Materials and surfaces

- Casing, front frame, nozzle plate, and perforated induced air grille (LR/LQ) made of galvanised sheet steel
- Border and blades of the induced air grille (GL/GQ) made of aluminium sections
- Heat exchanger with copper tubes and aluminium fins
- Exposed surfaces are powder-coated pure white (RAL 9010) or in any other RAL colour
- Heat exchanger also in black (RAL 9005)
- Nozzle plate powder-coated black (RAL 9005)
- Additional casing for extract air with a spigot made of galvanised sheet steel

Construction

- Powder-coated RAL 9010, pure white, gloss level 50 %
- P1: Powder-coated in any other RAL colour, gloss level 70 %
- P1: Powder-coated RAL 9006, white aluminium, gloss level 30 %

Technical data

- Nominal length: 900, 1200, 1500, 1800, 2100, 2400, 2700, 3000 mm
- Length: 893 – 3000 mm
- Height: 210/241 mm
- Width: 293, 300, 312 mm
- Primary air spigot, diameter: 123/158 mm
- Primary air volume flow rate: 5 – 70 l/s or 18 – 252 m³/h
- Cooling capacity: up to 1830 W
- Heating capacity: up to 1240 W
- Max. operating pressure: 6 bar
- Max. operating temperature: 75 °C

Sizing data

Primary air

- \dot{V} _____
[m³/h]
- Δp_t _____
[Pa]

Air-regenerated noise

- L_{WA} _____
[dB(A)]

Cooling

- \dot{Q}_{ges} _____
[W]

Heating

- \dot{Q}_{ges} _____
[W]

DID312

DID312 – LR – 2 – Z – LL – AV – A1 / 1800 × 1200 × 293 / P1 – RAL ... / G3 / VS

1 2 3 4 5 6 7 8 9 10 11 12

1 Type

DID312 Active chilled beam

2 Induced air grille

GL Longitudinal blades
GQ Transverse blades
LR Perforated metal, circular holes
LQ Perforated metal, square holes

3 Heat exchanger

2 2-pipe
4 4-pipe

4 Nozzle variant

Z Small plus
M Medium
G Large

5 Arrangement of casings and connections

LL (also available as supply and extract air combination)

LR

ML

MR

RL

RR (also available as supply and extract air combination)

Note

L = left side, R = right side, M = centre

6 Additional casing for extract air, with spigot

No entry: none

AV Front

AH Rear

7 Water connections

No entry: Ø12 mm pipe with plain tails

A1 With G½" external thread and flat seal

A2 With G½" union nut and flat seal

8 Total length (diffuser face) × nominal size [mm]

$L \times L_N$

Supply air

893 – 1500 × 900
1193 – 1800 × 1200
1493 – 2100 × 1500
1793 – 2400 × 1800
2093 – 2700 × 2100
2393 – 3000 × 2400
2693 – 3000 × 2700
2993 – 3000 × 3000

Supply and extract air combination

1090 – 1500 × 900
1390 – 1800 × 1200
1690 – 2100 × 1500
1990 – 2400 × 1800
2290 – 2700 × 2100
2590 – 3000 × 2400
2890 – 3000 × 2700

9 Width of front frame [mm]

B

293
300
312

10 Exposed surface

No entry: powder-coated
RAL 9010, pure white

P1 Powder-coated, specify RAL CLASSIC colour

Gloss level

RAL 9010 50 %

RAL 9006 30 %

All other RAL colours 70 %

11 Surface of heat exchanger

No entry: untreated

G3 RAL 9005, black

12 Valves and actuators

No entry: none

VS With

Order examples

DID312-LR-2-Z-LL/1193x1200x293

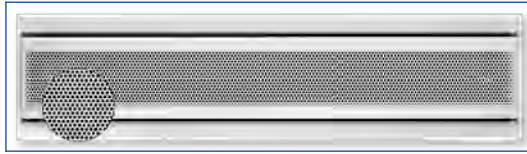
Induced air grille	Perforated metal, circular holes
Heat exchanger	2-pipe
Nozzle variant	Small plus
Arrangement of casings and connections	Left side, left side
Total length (diffuser face) × nominal length	1193 × 1200 × 293 mm

DID312-GL-4-M-RR-AV-A1/1193x900x293/P1-RAL9016/G3/VS

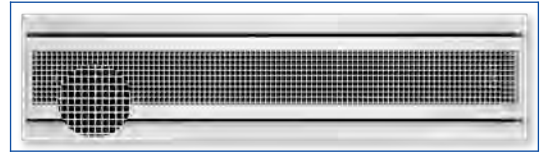
Induced air grille	Longitudinal blades
Heat exchanger	4-pipe
Nozzle variant	Medium
Arrangement of casings and connections	Right side, right side
Additional casing for extract air, with spigot	Front
Water connections	With G½" external thread and flat seal
Total length (diffuser face) × nominal length	1193 × 900 × 293 mm
Exposed surface	Powder-coated, RAL 9016
Surface of heat exchanger	Black (RAL 9005)
Valves and actuators	With

Product examples

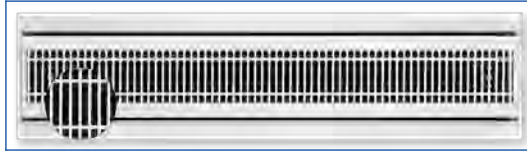
DID312-LR



DID312-LQ



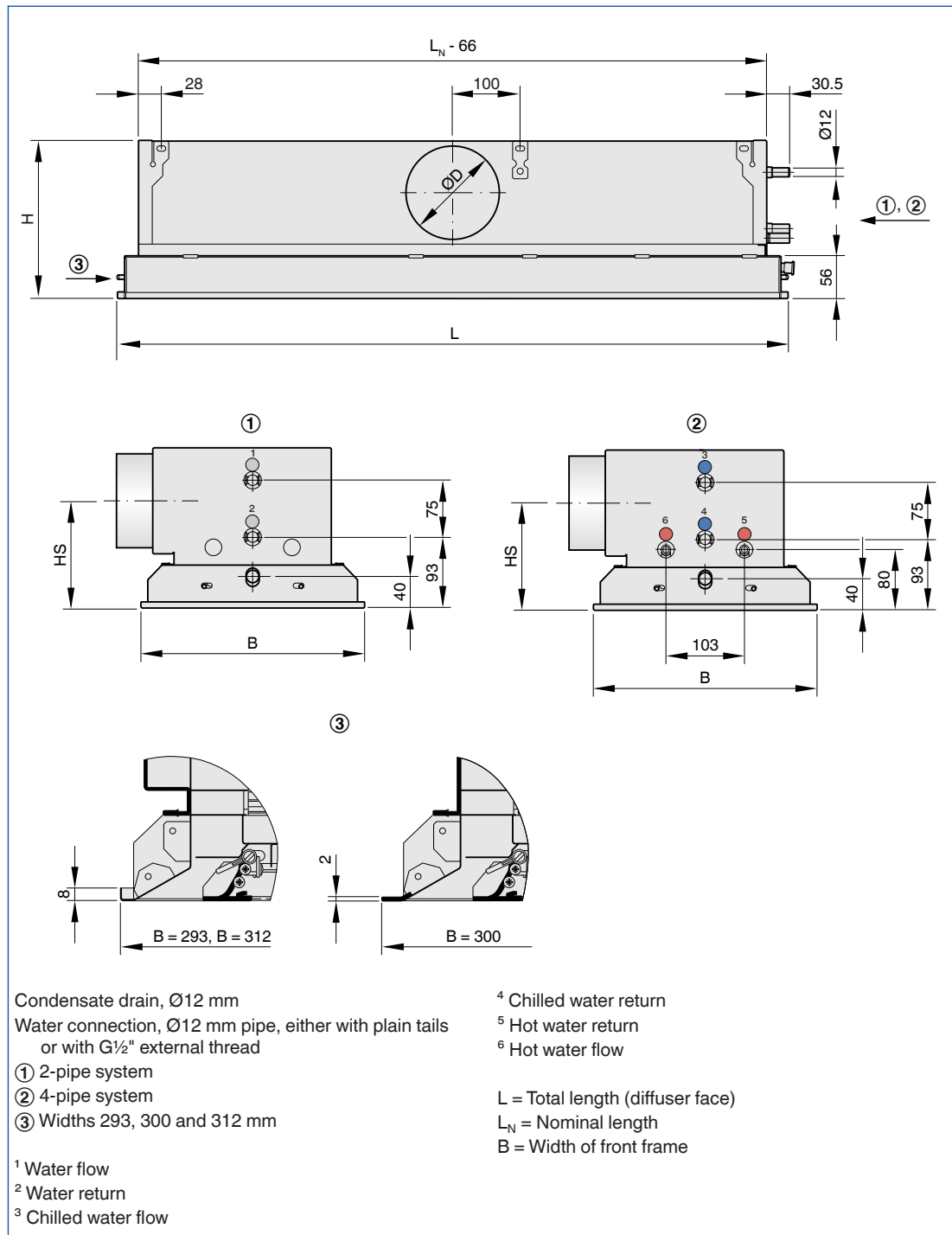
DID312-GQ



DID312-GL



DID312



Dimensions [mm]

B	293
	300
	312

B = Width of front frame

Dimensions [mm]

L_N	Available sizes	ØD	H	HS
	L			
900	893 – 1500	123	210	140
1200	1193 – 1800	123	210	140
1500	1493 – 2100	123	210	140
1800	1793 – 2400	123	210	140
2100	2093 – 2700	158	241	155
2400	2393 – 3000	158	241	155
2700	2693 – 3000	158	241	155
3000	2993 – 3000	158	241	155

L = Total length (diffuser face)

L_N = Nominal length

Weights

Nominal length (L _N)	mm	900	1200	1500	1800	2100	2400	2700	3000
DID312-LR	kg/piece	15	19	23	27	31	35	39	43
DID312-LQ	kg/piece	15	19	23	27	31	35	39	43
DID312-GL	kg/piece	16	20	25	29	33	38	42	46
DID312-GQ	kg/piece	16	20	25	29	33	38	42	46
Contained water (max.)	kg	0.7	1.0	1.3	1.6	1.9	2.2	2.5	2.8

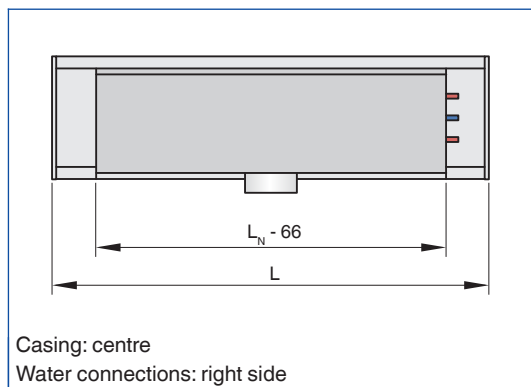
Non-active section as extension: 10 kg/m

Differences in width can be neglected

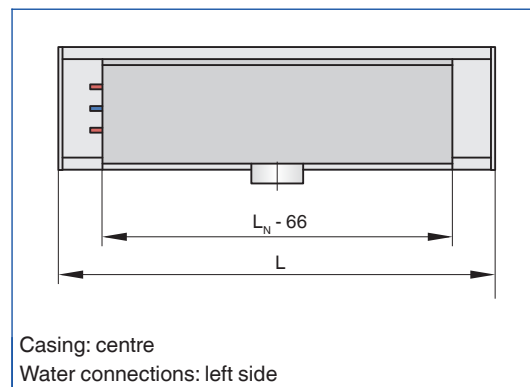
Casing arrangement

Supply air

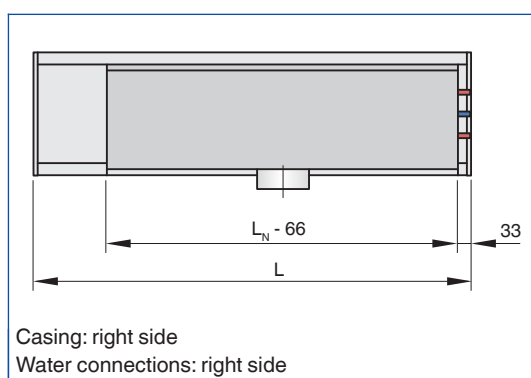
DID312-...-MR



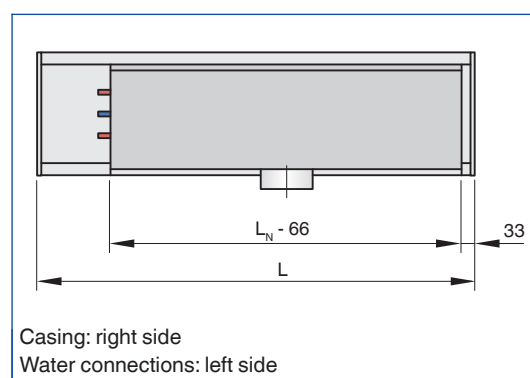
DID312-...-ML



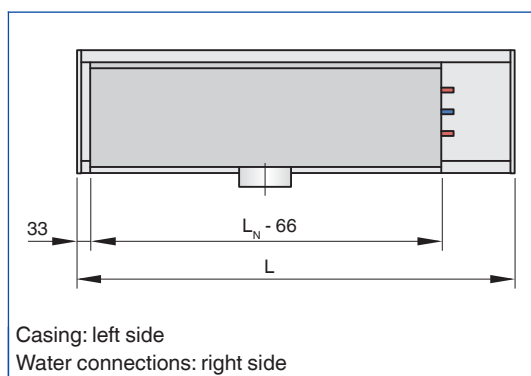
DID312-...-RR



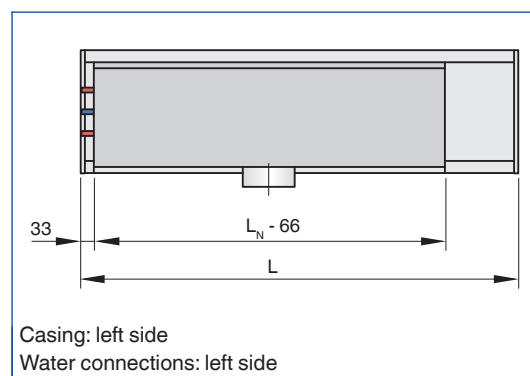
DID312-...-RL



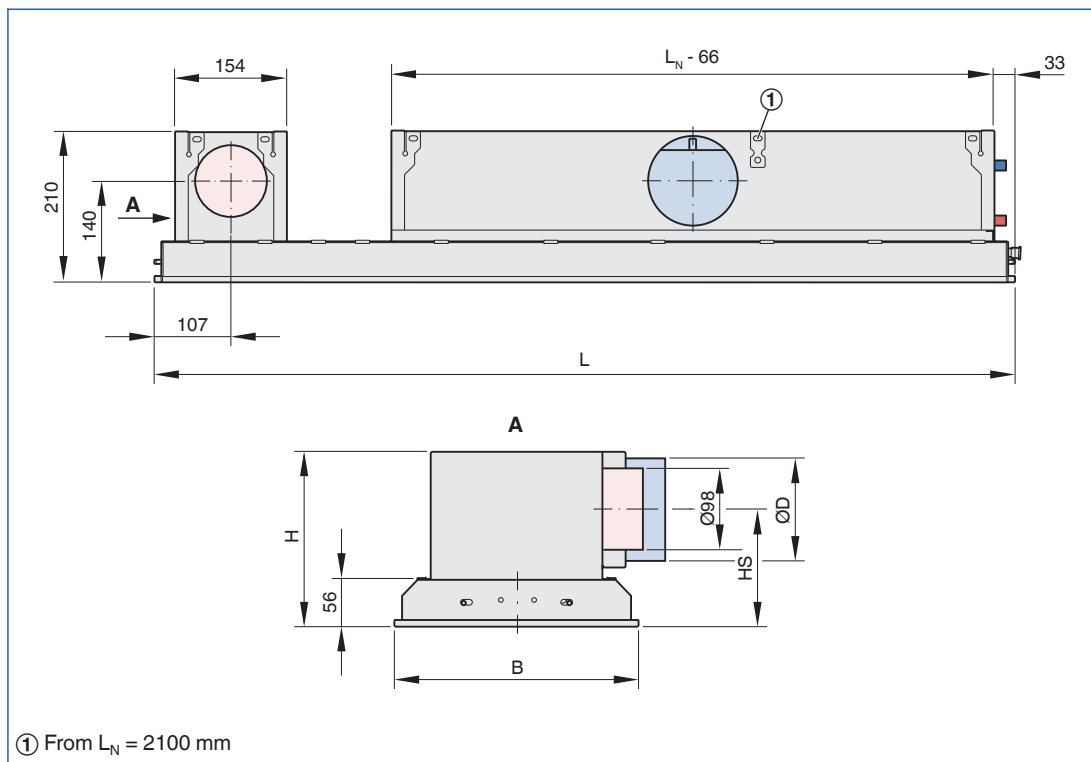
DID312-...-LR



DID312-...-LL



DID312, with additional casing for extract air



Dimensions [mm]

B	293
	300
	312

B = Width of front frame

Dimensions [mm]

L_N	Available sizes	$\varnothing D$	H	HS
	L			
900	1090 – 1500	123	210	140
1200	1390 – 1800	123	210	140
1500	1690 – 2100	123	210	140
1800	1990 – 2400	123	210	140
2100	2290 – 2700	158	241	155
2400	2590 – 3000	158	241	155
2700	2890 – 3000	158	241	155

L = Total length (diffuser face)

L_N = Nominal length

Weights

Nominal length (L_N)	mm	900	1200	1500	1800	2100	2400	2700
DID312-LR	kg/piece	15	19	23	27	31	35	39
DID312-LQ	kg/piece	15	19	23	27	31	35	39
DID312-GL	kg/piece	16	20	25	29	33	38	42
DID312-GQ	kg/piece	16	20	25	29	33	38	42
Contained water (max.)	kg	0.7	1.0	1.3	1.6	1.9	2.2	2.5

Non-active section as extension: 10 kg/m

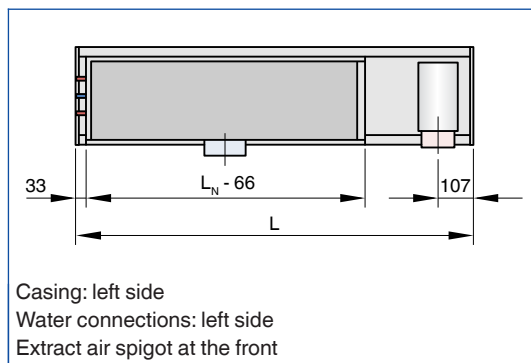
Extract air spigot $\varnothing 98$ mm, 3 kg/piece

Differences in width can be neglected

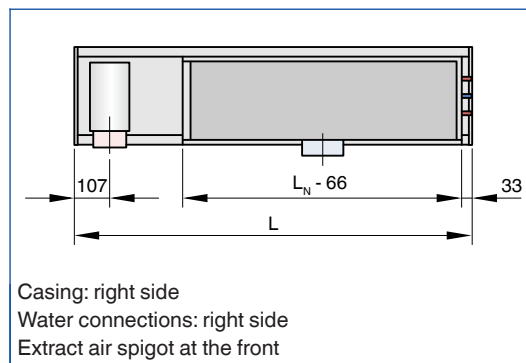
Casing arrangement

Mit Zusatzgehäuse für
 Abluft

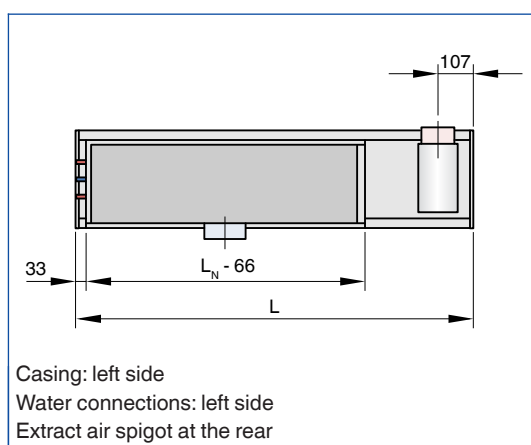
DID312-...-LL-AV



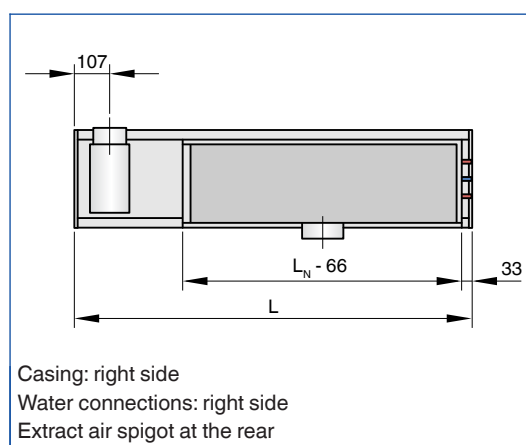
DID312-...-RR-AV



DID312-...-LL-AH



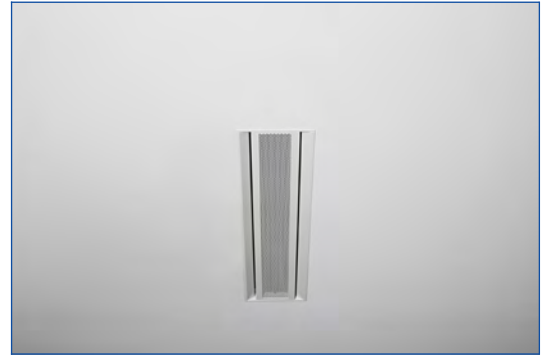
DID312-...-RR-AH



Installation into grid ceilings



Installation into continuous plasterboard ceilings



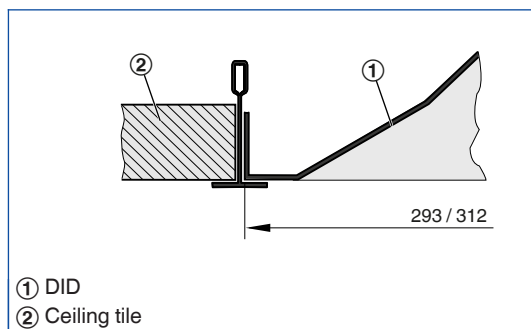
Installation and commissioning

- Preferably for rooms with a clear height up to 4.00 m
- Flush ceiling installation
- Side entry primary air spigot
- Lengths from 893 to 3000 mm, and widths of 293, 300, and 312 mm, hence suitable for various ceiling systems
- Installation and connections to be performed by others; fixing, connection and sealing material to be provided by others
- Active chilled beam has 4 suspension points (6 for nominal size 2100 mm and above) for on-site installation (by others)
- Heat exchangers are fitted with water flow and water return connections at the narrow side

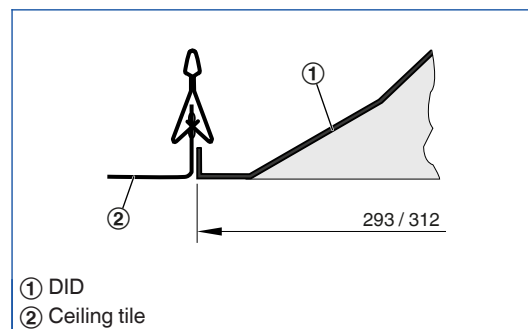
Installation into T-bar ceilings

- To avoid too much load on the ceiling, the suspension points should be used

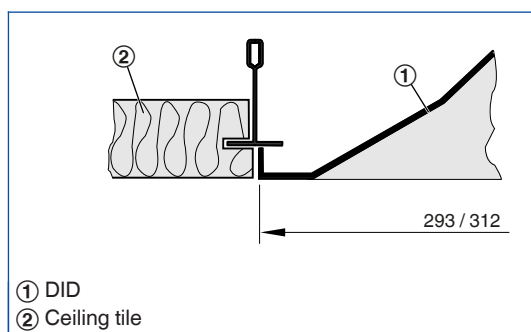
Ceiling installation, visible T-bars



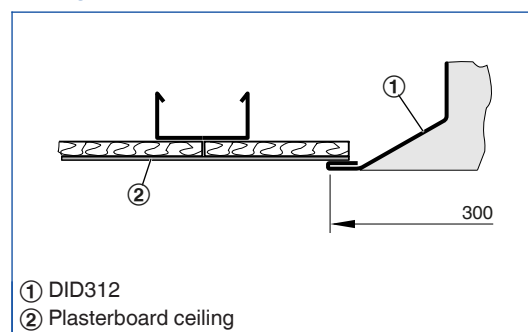
Ceiling installation with clamping profile



Ceiling installation, concealed T-bars



Ceiling installation of DID312, plasterboard ceiling



L_N [mm]

Nominal length

L_{WA} [dB(A)]

Sound power level

t_{Pr} [°C]

Primary air temperature

t_{wV} [C°]

Water flow temperature – cooling/heating

t_R [C°]

Room temperature

t_R [C°]

Room temperature

t_{AN} [C°]

Secondary air intake temperature

Q_{Pr} [W]

Thermal output – primary air

Q_{tot} [W]

Thermal output – total

Q_w [W]

Thermal output – water side, cooling/heating

\dot{V}_{Pr} [l/s]

Primary air volume flow rate

\dot{V}_{Pr} [m³/h]

Primary air volume flow rate

\dot{V}_w [l/h]

Water flow rate – cooling/heating

\dot{V} [l/h]

Volume flow rate

Δt_w [K]

Temperature difference – water

Δp_w [kPa]

Pressure drop, water side

Δp_t [Pa]

Total pressure drop, air side

$\Delta t_{Pr} = t_{Pr} - t_R$ [K]

Difference between primary air temperature and room temperature

$\Delta t_{RwV} = t_{wV} - t_R$ [K]

Difference between water flow temperature and room temperature

Δt_{wM-Ref} [K]

Difference between mean water temperature and reference temperature

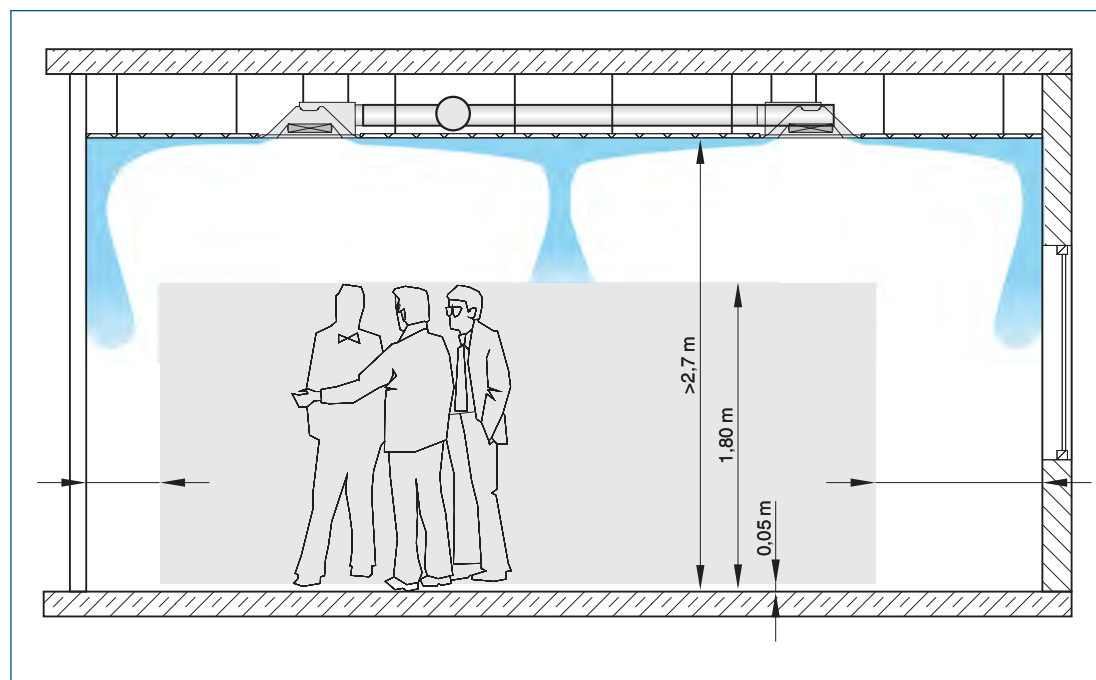
L_N [mm]

Nominal length

Mixed flow

The supply air is discharged from the diffuser into the space with a velocity between 2 and 5 m/s. The resulting air jet mixes with the room air, ventilating the entire space. Mixed flow systems typically provide a uniform temperature distribution and air quality within the space. The originally high velocity of the turbulent air jet decreases rapidly due to the high induction levels of mixed flow systems.

Schematische Darstellung Mischlüftung



Heat exchanger

The maximum water-side operating pressure for all heat exchangers is 6 bar.

The maximum water flow temperature (heating circuit) for all heat exchangers is 75 °C; if flexible hoses are used, the water flow temperature should not exceed 55 °C. Units for other pressures

and temperatures are available on request.

The water flow temperature (cooling circuit) should be at least 16 °C such that it does not permanently fall below the dew point. For units with a condensate drip tray the water flow temperature may be reduced to 15 °C.

Heat exchanger as 2-pipe system

Air-water systems with a 2-pipe heat exchanger may be used for either heating or cooling. In

changeover mode it is possible to use all units within a water circuit exclusively for cooling in summer and exclusively for heating in winter.

Wärmeübertrager 2-Leiter-System



Heat exchanger as 4-pipe system

Air-water systems with a 4-pipe heat exchanger may be used for both heating and cooling. Depending on the season, i.e. especially in spring

and autumn, it may be possible that an office has to be heated in the morning and cooled in the afternoon.

Wärmeübertrager 4-Leiter-System

