

TECHNICAL INFORMATION

COMFORT FAN COIL SYSTEM
INDULVENT connect

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INDULVENT connect

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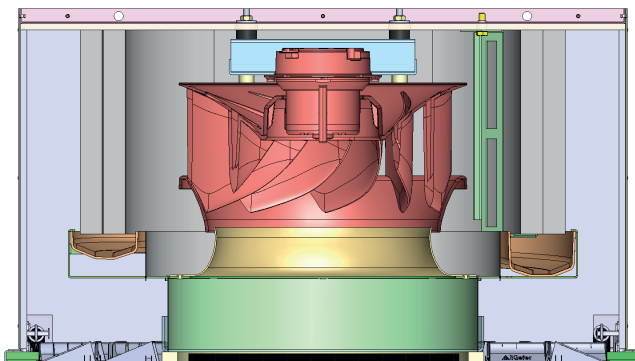
ADVANTAGES, FEATURES, AREAS OF APPLICATION

The INDULVENT connect comfort fan coil system is a fan coil unit for cooling rooms with a 2-line system, or for cooling and heating with a 4-line system. The unit is designed for condensing operation and therefore has a condensate pan and a condensate pump. It can be installed both in suspended ceilings and freely suspended without a suspended ceiling (only in conjunction with RQF front plate) and has been designed for rooms with conventional air qualities such as offices, meeting rooms, showrooms, laboratories, treatment rooms etc. The INDULVENT connect fan coil system is not suitable for rooms with very polluted air, or air that contains oils or aggressive chemicals.



Function description of INDULVENT connect – cooling

The radial fan draws warm ambient air into the unit through the central air intake in the front plate via a filter fleece (EN779/G2), passing the air through a heat exchanger to cool it. The filter fleece protects the components from soiling, according to its specification. Water flows through the heat exchanger as a coolant. The cooled recirculation air is then introduced into the room via the front plate with the highly inductive and draught-free air guide elements INDULCLIP (RQD version) and INDUDRALL (RQF version).



Cross-section of INDULVENT connect

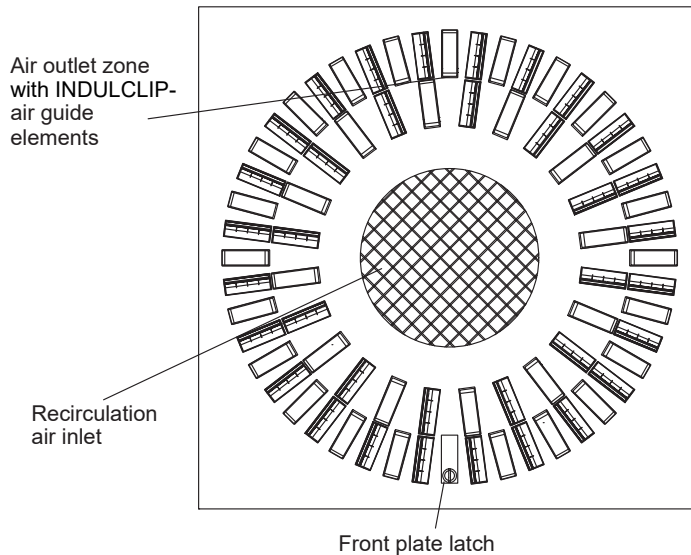
The sound power, caloric output and air flow rate are important considerations in the design of the unit.

The cooling capacity is adjusted to the cooling load of the room by changing the fan speed and/or by varying the amount of water. The control options are described in Part I from page 19 onwards.

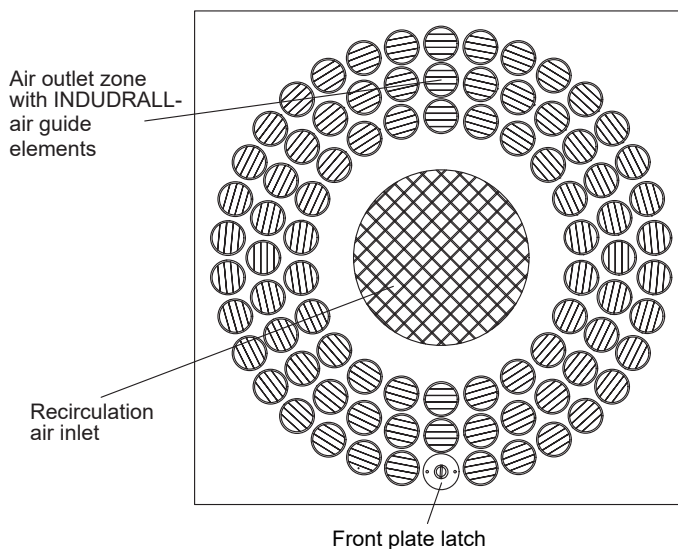


Precautions must therefore be taken at all times during condensing operation to ensure that the condensate created can be drained off via the integrated condensate pump.

Front plate RQD for installation in suspended ceilings



Front plate RQF for freely suspended installation without an intermediate ceiling or for installation in suspended ceilings.

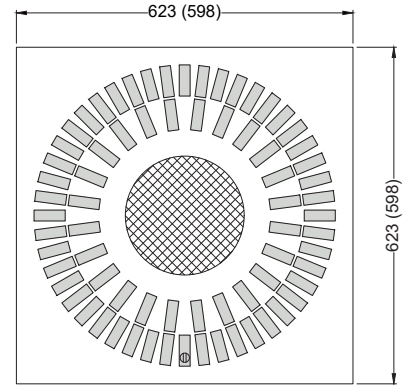
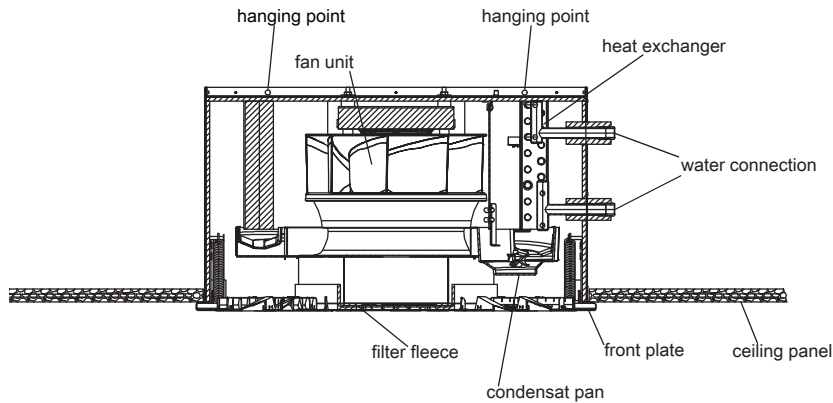


The front plate is particularly easy to service thanks to the folding hinges. This allows the unit to be opened and closed quickly for cleaning and maintenance. The front plate is made of galvanised sheet steel with a powder coating in RAL 9010 (standard).

Air guide elements and honeycomb louvre of the front panel can be supplied optionally in black or light grey. Other colours are possible on request. The housing is made of galvanised sheet steel. The heat exchanger is made of AlCu, and the condensate pans are made of flame-retardant, impact-resistant ABS plastic.

DIMENSIONS, VIEWS TECHNICAL DRAWINGS

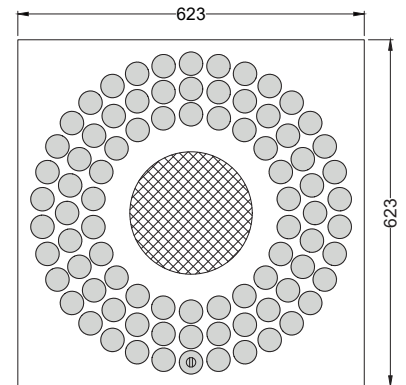
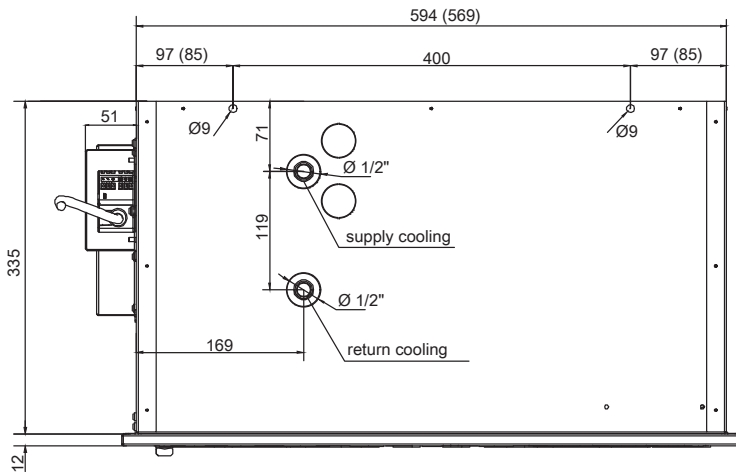
Version with 2-pipe heat exchanger - sectional view



Bottom view - front panel RQD

► Note: Dimensions in brackets apply for size 600 x 600 mm.

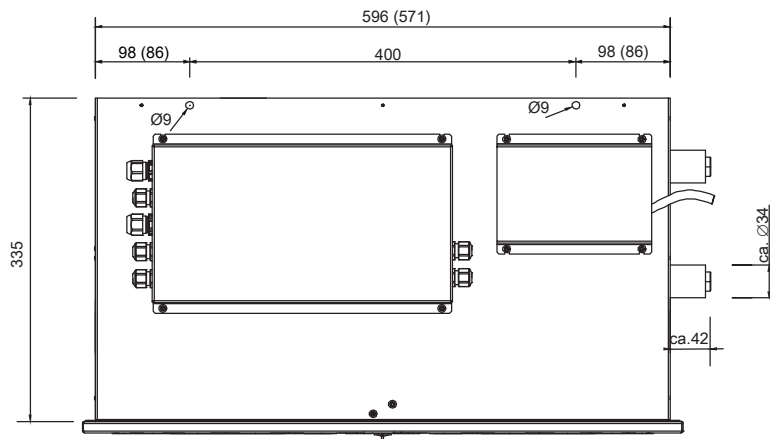
Side view cold water connection - 2-pipe



Bottom view - front panel RQF

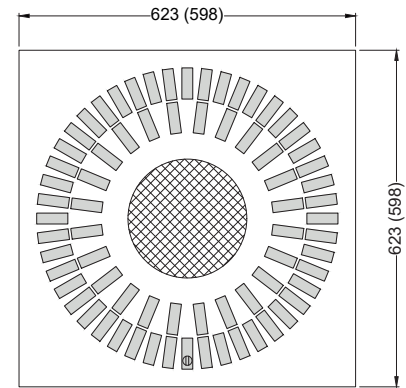
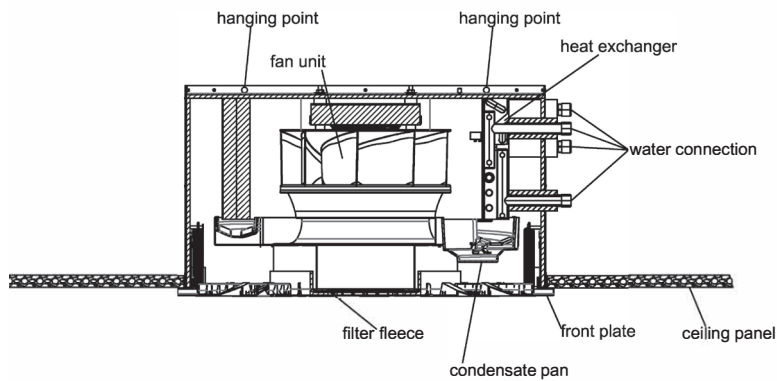
► Note: Only possible for size 625 x 625 mm.

Side view of electrical connection



DIMENSIONS, VIEWS TECHNICAL DRAWINGS

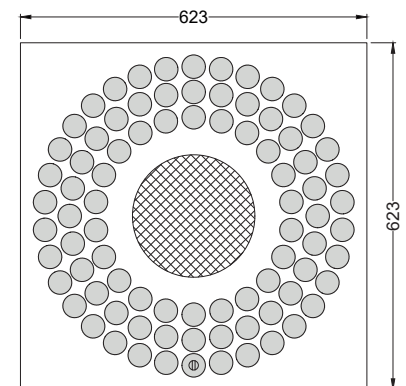
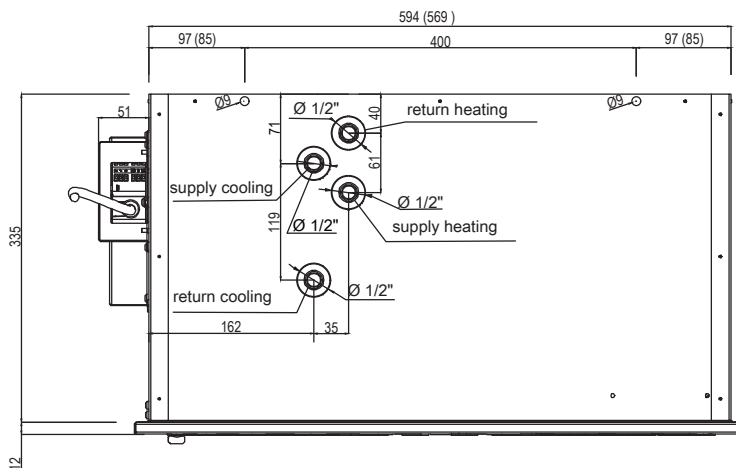
Version with 4-pipe heat exchanger - sectional view



Bottom view - front panel RQD

► Note: Dimensions in brackets apply for size 600 x 600 mm.

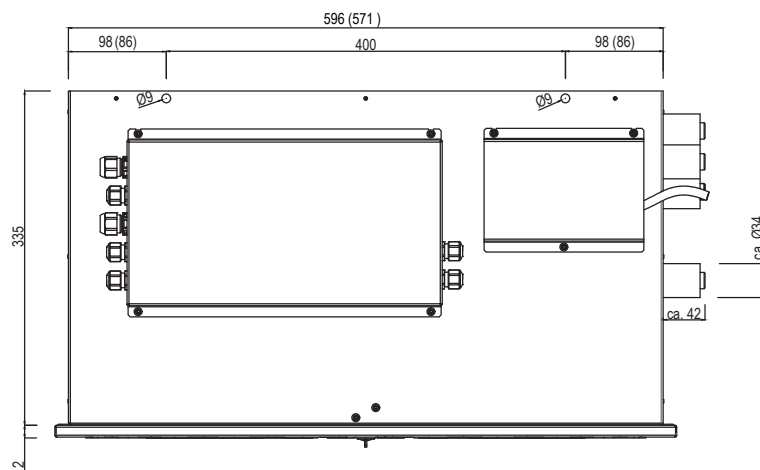
Side view cold and hot water connection - 4-pipe



Bottom view - front panel RQF

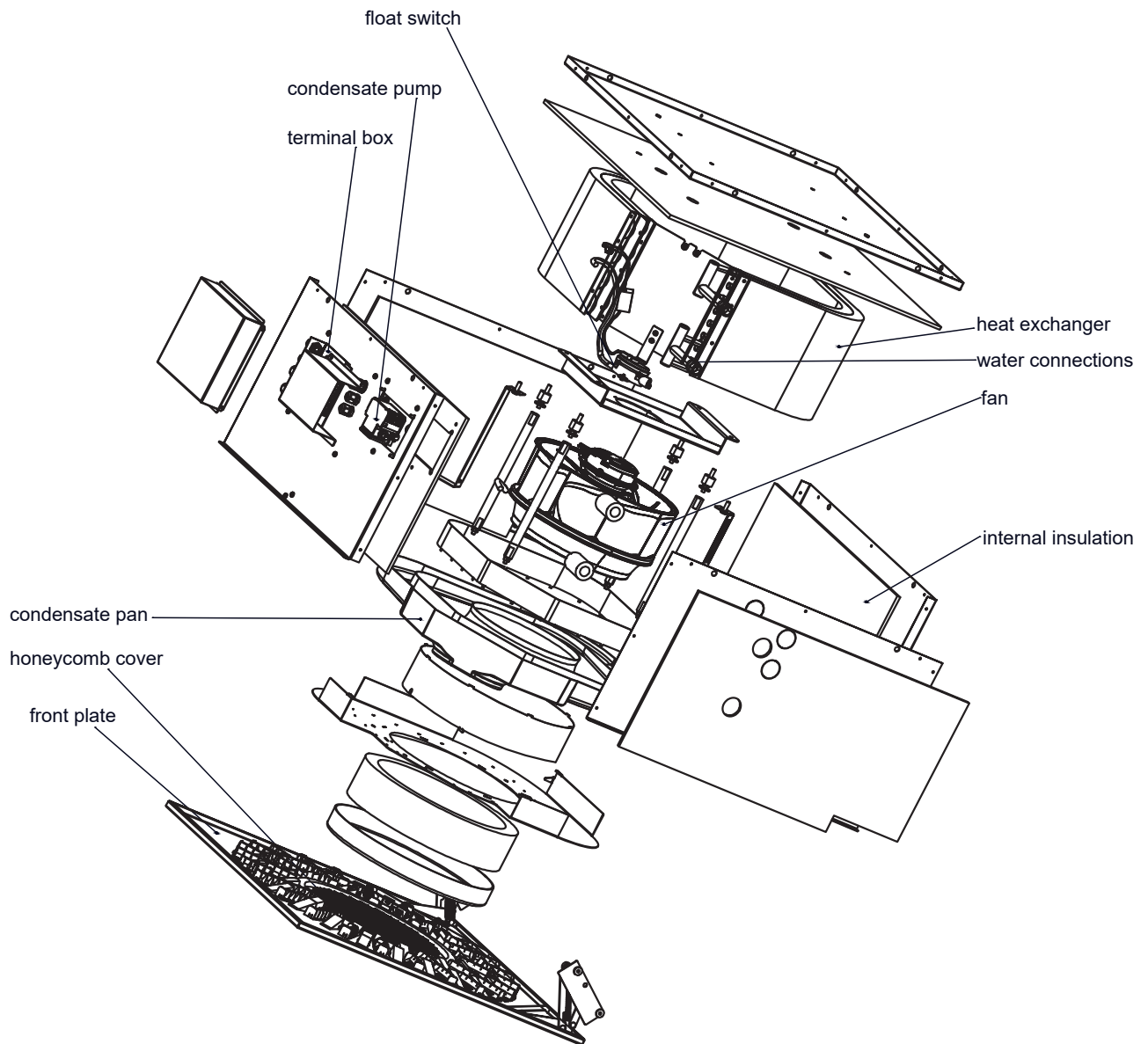
► Note: Only possible for size 625 x 625 mm.

Side view of electrical connection



EXPLODED VIEW

Version with 2-pipe heat exchanger



TECHNICAL DATA INDULVENT connect

INDULVENT connect

		2-pipe		4-pipe	
		Cooling		Cooling	Heating
OPERATING RANGE					
Temperature	°C	+ 5 to + 40		+ 5 to + 40	
Relative humidity	RH %	30 to 70		30 to 70	
DIMENSIONS HOUSING ¹⁾					
Height (total)	mm	335		335	
Width Size	625 (600)	mm	596 (571)	596 (571)	
Length Size	625 (600)	mm	594 (569)	594 (569)	
DIMENSIONS FRONT PLATE					
Height	mm	12		12	
Width Size	625 (600)	mm	623 (598)	623 (598)	
Length Size	625 (600)	mm	623 (598)	623 (598)	
HEAT EXCHANGER – WATER AS OPERATING MEDIUM					
Operating limits water temperature	°C	+ 5 to + 65		+ 5 to + 65	
Test pressure	bar	10		10	
Nominal water flow rate	l/h	250		250	150
Nominal pressure drop	kPa	7,4		6,5	2,2
Supply/return water connection pipe	-	½" male thread		½" male thread	
Water content	l	1,8		1,8	
CONDENSATE PUMP					
Condensate connection (pressure line)	mm	6 x 1,5		6 x 1,5	
Condensate pump delivery head / flow rate	m / l/h	3,5 / 6		3,5 / 6	-
ELECTROTECHNICAL DATA					
Mains connection	V / Hz	230 / 50		230 / 50	
IP rating (housing / radial fan)	-	IP20/IP54		IP20/IP54	
Power requirement of condensate pump (Operation / Standby)	W	8 / 1		8 / 1	
Nominal fan power consumption ²⁾	W	30		30	
GENERAL					
Operating weight	kg	33		33	

¹⁾without frontplate

²⁾Power requirement at control voltage 10 VDC

Cooling capacity data INDULVENT connect with 2-pipe heat exchanger at different room air conditions and cold water flow temperatures

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	884	745	597	440	342	9
3	27	1144	962	768	555	463	10
4	33	1324	1110	883	670	560	11
5	37	1455	1216	966	763	638	13
6	40	1557	1298	1029	842	704	15
7	43	1639	1366	1081	913	764	18
8	46	1714	1426	1126	981	821	21
9	49	1786	1483	1220	1050	879	25
10	52	1856	1538	1303	1122	940	30

* Ambient air conditions: 24 °C / 50 % rel. humidity, dew point: 12,8 °C, $\dot{m} = 250$ kg/h

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Sensitive cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	599	533	468	404	342	9
3	27	789	705	622	537	463	10
4	33	931	835	739	657	560	11
5	37	1042	938	833	758	638	13
6	40	1136	1024	913	842	704	15
7	43	1220	1103	986	913	764	18
8	46	1300	1178	1057	981	821	21
9	49	1382	1256	1176	1050	879	25
10	52	1471	1340	1279	1122	940	30

* Ambient air conditions: 24 °C / 50 % rel. humidity, dew point: 12,8 °C, $\dot{m} = 250$ kg/h

Cooling capacity data INDULVENT connect with 2-pipe heat exchanger at different room air conditions and cold water flow temperatures

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	1043	905	758	601	432	9
3	27	1352	1169	975	769	552	10
4	33	1566	1349	1121	882	667	11
5	37	1720	1479	1226	962	760	13
6	40	1839	1578	1307	1022	840	15
7	43	1938	1660	1371	1071	911	18
8	46	2026	1733	1430	1115	980	21
9	49	2109	1802	1483	1220	1050	25
10	52	2190	1868	1536	1305	1123	30

* Ambient air conditions: 26 °C / 50 % rel. humidity, dew point: 14,6 °C, $\dot{m} = 250$ kg/h

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Sensitive cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	658	594	529	465	401	9
3	27	866	783	700	618	537	10
4	33	1020	924	829	735	658	11
5	37	1139	1034	931	829	760	13
6	40	1240	1128	1018	908	840	15
7	43	1328	1211	1097	983	911	18
8	46	1413	1293	1173	1054	980	21
9	49	1499	1375	1252	1179	1050	25
10	52	1593	1463	1338	1286	1123	30

* Ambient air conditions: 26 °C / 50 % rel. humidity, dew point: 14,6 °C, $\dot{m} = 250$ kg/h

Cooling capacity data INDULVENT connect with 2-pipe heat exchanger at different room air conditions and cold water flow temperatures

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	1212	1073	927	770	602	9
3	27	1570	1388	1193	986	768	10
4	33	1821	1602	1373	1133	878	11
5	37	2001	1757	1502	1234	955	13
6	40	2140	1875	1600	1312	1012	15
7	43	2255	1973	1678	1374	1058	18
8	46	2355	2057	1749	1429	1137	21
9	49	2453	2138	1815	1481	1219	25
10	52	2544	2215	1878	1531	1304	30

* Ambient air conditions: 28 °C / 50 % rel. humidity, dew point: 16,6 °C, \dot{m} = 250 kg/h

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Sensitive cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	718	653	589	525	461	9
3	27	942	859	776	695	613	10
4	33	1106	1011	916	822	730	11
5	37	1233	1129	1027	924	825	13
6	40	1338	1229	1120	1011	906	15
7	43	1431	1316	1203	1091	980	18
8	46	1521	1403	1284	1167	1084	21
9	49	1610	1488	1367	1245	1180	25
10	52	1708	1581	1457	1333	1287	30

* Ambient air conditions: 28 °C / 50 % rel. humidity, dew point: 16,6 °C, \dot{m} = 250 kg/h



Note

Due to the large number of parameters, please contact our technical sales team for a project- and room-specific design.



Cooling capacity data INDULVENT connect with 4-pipe heat exchanger at different room air conditions and cold water flow temperatures

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	516	434	348	256	202	9
3	27	753	631	504	372	310	10
4	33	940	787	626	485	405	11
5	37	1088	909	722	581	486	13
6	40	1208	1007	798	664	556	15
7	43	1308	1089	862	739	619	18
8	46	1397	1161	940	810	677	21
9	49	1474	1225	1018	876	734	25
10	52	1540	1278	1091	940	788	30

* Ambient air conditions: 24 °C / 50 % rel. humidity, dew point: 12,8 °C, $\dot{m} = 250$ kg/h

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Sensitive cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	351	313	276	238	202	9
3	27	523	469	414	363	310	10
4	33	668	601	534	481	405	11
5	37	790	712	635	581	486	13
6	40	893	808	724	664	556	15
7	43	987	895	803	739	619	18
8	46	1074	977	912	810	677	21
9	49	1160	1056	1007	876	734	25
10	52	1241	1132	1091	940	788	30

* Ambient air conditions: 24 °C / 50 % rel. humidity, dew point: 12,8 °C, $\dot{m} = 250$ kg/h

Cooling capacity data INDULVENT connect with 4-pipe heat exchanger at different room air conditions and cold water flow temperatures

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	609	528	442	350	252	9
3	27	889	768	640	505	370	10
4	33	1112	957	795	625	483	11
5	37	1287	1106	916	719	579	13
6	40	1428	1225	1013	794	663	15
7	43	1547	1326	1094	856	739	18
8	46	1652	1414	1165	941	810	21
9	49	1743	1490	1227	1019	877	25
10	52	1821	1554	1278	1093	942	30

* Ambient air conditions: 26 °C / 50 % rel. humidity, dew point: 14,6 °C, \dot{m} = 250 kg/h

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Sensitive cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	386	348	311	273	236	9
3	27	574	520	466	412	363	10
4	33	731	664	597	531	483	11
5	37	862	785	708	633	579	13
6	40	973	889	804	721	663	15
7	43	1073	982	892	802	739	18
8	46	1167	1069	973	915	810	21
9	49	1256	1155	1054	1012	877	25
10	52	1341	1236	1133	1093	942	30

* Ambient air conditions: 26 °C / 50 % rel. humidity, dew point: 14,6 °C, \dot{m} = 250 kg/h



Note

Due to the large number of parameters, please contact our technical sales team for a project- and room-specific design.



Cooling capacity data INDULVENT connect with 4-pipe heat exchanger at different room air conditions and cold water flow temperatures

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	708	626	540	449	350	9
3	27	1033	913	784	648	505	10
4	33	1293	1137	975	803	623	11
5	37	1496	1314	1123	923	714	13
6	40	1663	1457	1242	1019	787	15
7	43	1801	1575	1342	1098	846	18
8	46	1922	1680	1427	1167	940	21
9	49	2028	1769	1503	1227	1019	25
10	52	2118	1845	1565	1275	1095	30

* Ambient air conditions: 28 °C / 50 % rel. humidity, dew point: 16,6 °C, $\dot{m} = 250$ kg/h

Cooling capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Sensitive cooling capacity [W]					Power consumption [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	420	383	346	308	272	9
3	27	624	570	516	462	409	10
4	33	792	726	659	593	528	11
5	37	933	856	779	705	631	13
6	40	1051	968	883	801	719	15
7	43	1157	1067	978	887	800	18
8	46	1254	1160	1065	970	918	21
9	49	1350	1250	1150	1052	1013	25
10	52	1440	1335	1233	1131	1095	30

* Ambient air conditions: 28 °C / 50 % rel. humidity, dew point: 16,6 °C, $\dot{m} = 250$ kg/h

Heating capacity data INDULVENT connect with 4-pipe heat exchanger at different room air conditions and cold water flow temperatures

Heating capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Heating capacity [W]							Power consumption [W]
		Hot water supply temperature							
		35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	
2	< 25	163	217	271	325	379	433	488	9
3	27	263	351	438	526	613	701	789	10
4	33	340	453	567	680	793	907	1020	11
5	37	401	535	668	802	936	1069	1203	13
6	40	451	602	752	903	1053	1204	1354	15
7	43	496	661	826	991	1156	1321	1487	18
8	46	536	715	894	1072	1251	1430	1608	21
9	49	575	767	958	1150	1342	1533	1725	25
10	52	613	817	1021	1226	1430	1634	1838	30

* Ambient air conditions: 20 °C / 50 % rel. humidity, $\dot{m} = 150 \text{ kg/h}$

Heating capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Heating capacity [W]							Power consumption [W]
		Hot water supply temperature							
		35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	
2	< 25	141	195	249	303	358	412	466	9
3	27	228	315	403	491	578	666	754	10
4	33	295	408	521	635	748	861	975	11
5	37	348	481	615	748	882	1016	1149	13
6	40	391	542	692	843	993	1144	1294	15
7	43	429	595	760	925	1090	1255	1420	18
8	46	465	643	822	1001	1179	1358	1537	21
9	49	498	690	882	1073	1265	1457	1648	25
10	52	531	735	940	1144	1348	1552	1757	30

* Ambient air conditions: 22 °C / 50 % rel. humidity, $\dot{m} = 150 \text{ kg/h}$

Heating capacity data INDULVENT connect with 4-pipe heat exchanger at different room air conditions and cold water flow temperatures

Heating capacity*

Control voltage [V(DC)]	Sound power level [dB(A)]	Heating capacity [W]							Power consumption [W]
		Hot water supply temperature							
		35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	
2	< 25	119	173	228	282	336	390	444	9
3	27	193	280	368	456	543	631	719	10
4	33	249	363	476	589	703	816	929	11
5	37	294	428	561	695	829	962	1096	13
6	40	331	482	632	783	933	1083	1234	15
7	43	363	529	694	859	1024	1189	1354	18
8	46	393	572	751	929	1108	1287	1465	21
9	49	422	613	805	997	1188	1380	1572	25
10	52	449	654	858	1062	1266	1471	1675	30

* Ambient air conditions: 24 °C / 50 % rel. humidity, $\dot{m} = 150 \text{ kg/h}$

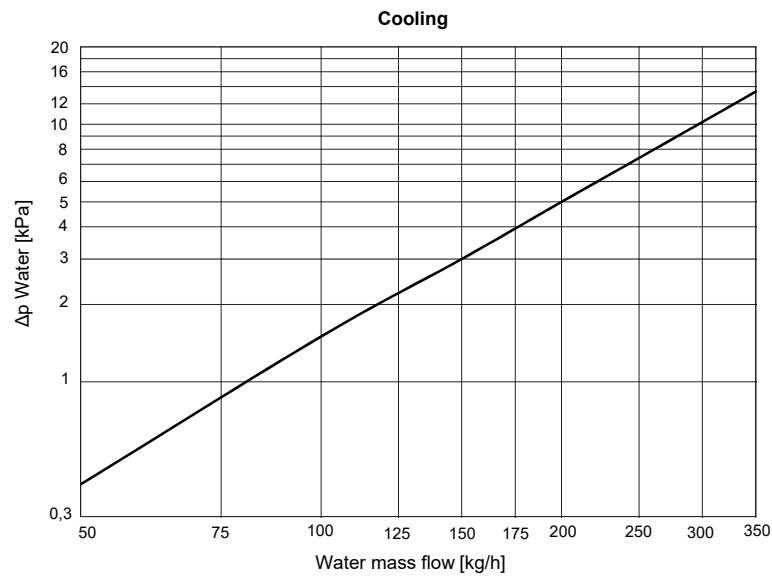


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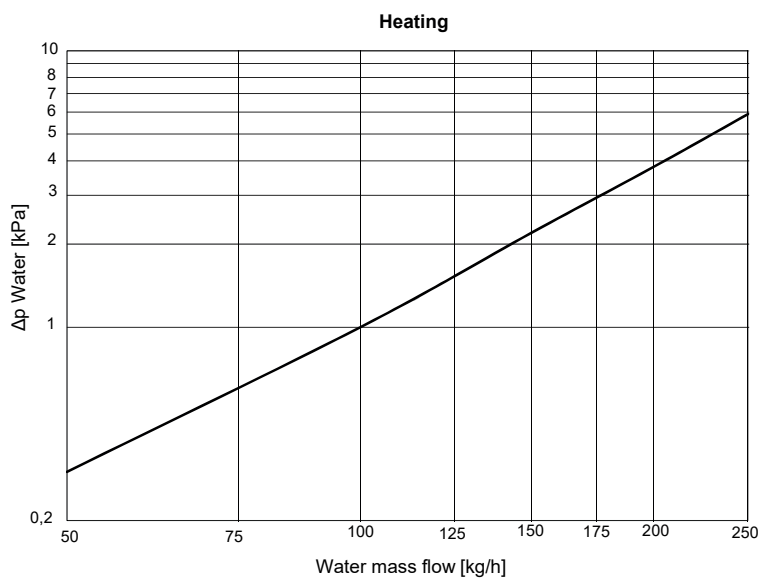
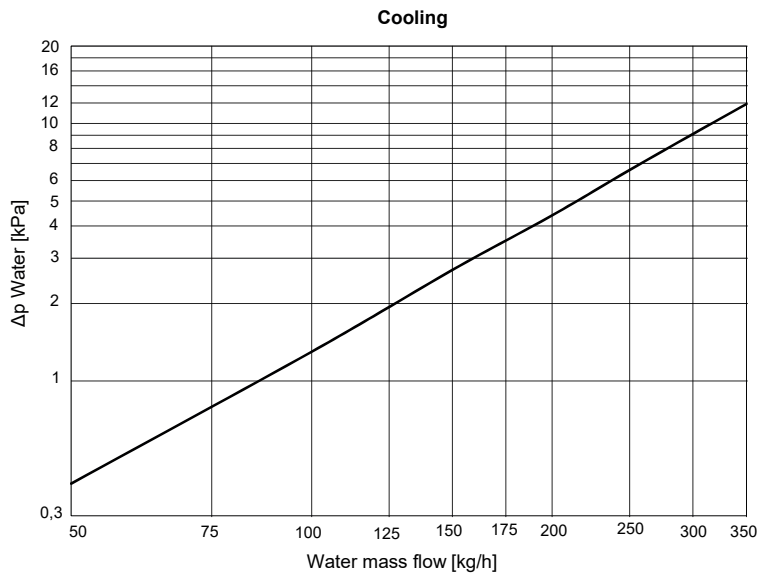
Due to the large number of parameters, please contact our technical sales team for a project- and room-specific design.



Water-side pressure drop INDULVENT connect with 2-pipe heat exchanger



Water-side pressure drop INDULVENT connect with 4-pipe heat exchanger



The cooling capacity largely depends on:

- The set parameters
- The automatically adjusted or controlled fan speed
- The ambient air temperature and humidity
- The cold water supply temperature and the cold water mass flow rate

Determining performance based on charts or formulas is therefore complex and prone to errors.

The speed of the fan changes constantly depending on the ambient air temperature, as does the cooling capacity during condensing operation.



Note

Due to the large number of parameters, please contact our technical sales team for a project- and room-specific design.



INDULVENT connect application options and control versions

Operate in dry internal spaces with ambient temperatures of 5 to 40 °C (relative humidity in the room 30 % to 70 %). The unit has been developed for use in locations where the prevailing air quality is typical of offices in terms of dust levels and corrosive/oily constituents.

INDULVENT connect enables the conditioning of the ambient air. The secondary air is drawn into the unit by the fan and is routed across the integral heat exchanger. It is conditioned according to demand and then returned to the room without creating a draught.

The cooling and/or heating output of the unit can be matched to the room cooling or heating load by controlling the fan speed (air flow rate) and the quantity of cooling water.

Depending on the selected control strategy, INDULVENT connect can be connected to a room control unit so that it operates in automatic standalone mode, or it can be operated manually with various fan stages. It can also be controlled by a building management system (BMS).

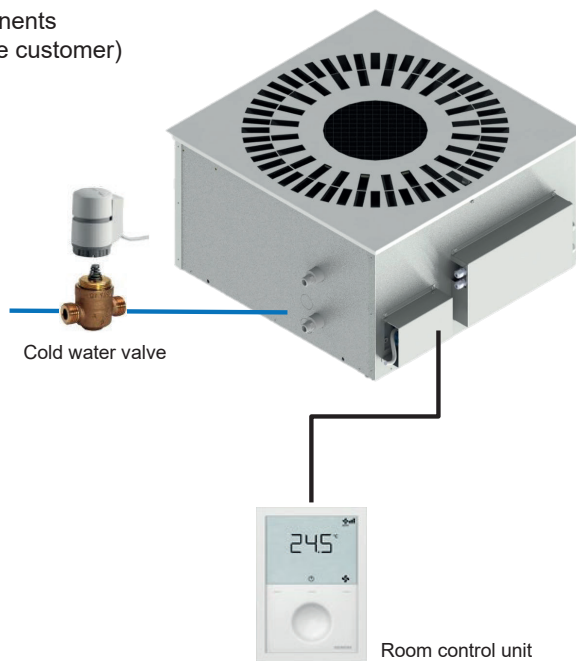
Overview of control versions

Control version 1

INDULVENT connect as a **standalone version** for automatic standalone or manual control of the ambient temperature by means of the fan speed and valve settings with a preprogrammed room control unit.

The RDG200KN room control unit includes a controller with room thermostat and sensor.

Controller components
(installation by the customer)



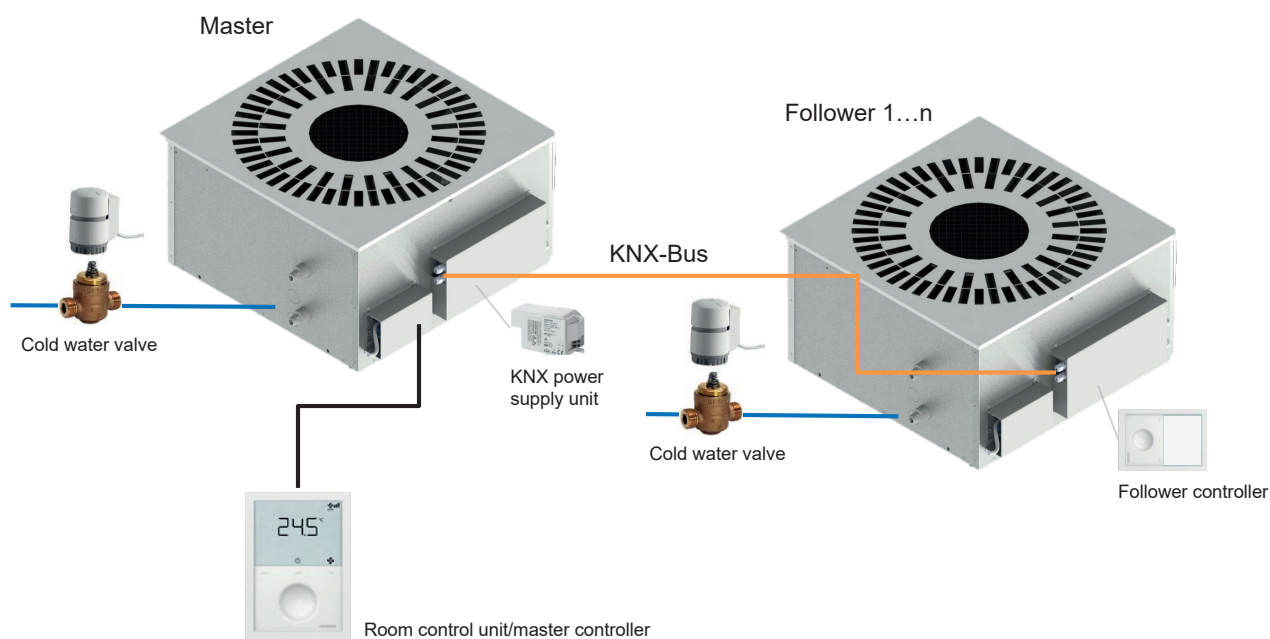
- Illustration of an INDULVENT connect 2-pipe unit with a room control unit including valve and actuator, connected by means of the appropriate cable.

INDULVENT connect 4-pipe version with an additional valve and actuator.

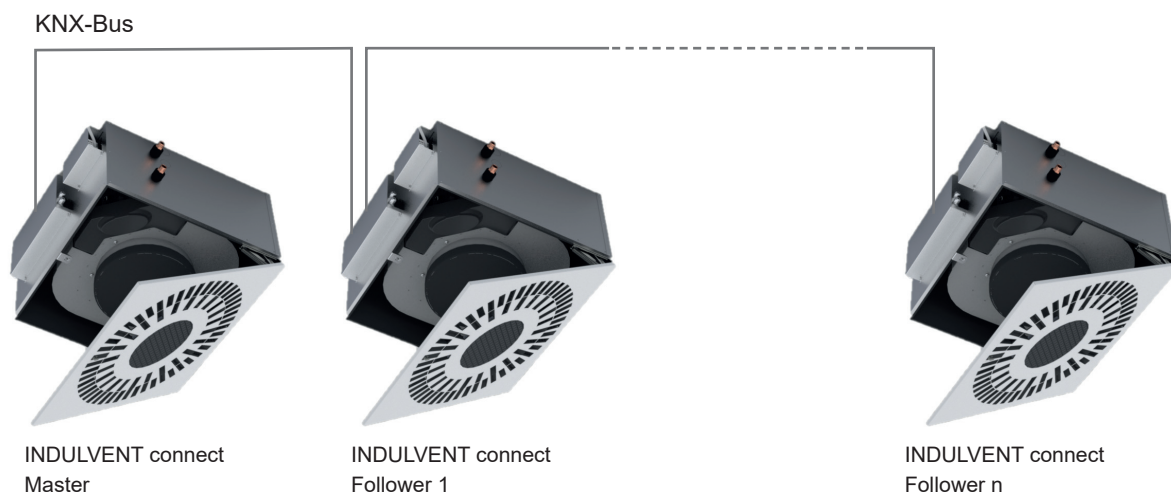
Control version 2

INDULVENT connect as a master and follower version for automatic standalone or manual control of the ambient temperature by means of the fan speed and valve settings from a group of devices. Controlled through a preprogrammed room control unit (master controller), which communicates with the preprogrammed and addressed follower controllers via a KNX bus.

Controller components
(installation by the customer)



If several INDULVENT connect units are operated in the same control zone, a master unit can control up to 9 follower units via the two-wire KNX-BUS. The master specifies the speed of all connected follower units, depending on the user requirements and measured actual ambient air temperature.



Depending on the required control version, a parameter set defined by Kiefer specifically for the INDULVENT connect is factory-installed on the room control unit (RDG200KN). A label attached to the controller packaging identifies the control version and address.

Control versions – INDULVENT connect

	Individual device	Group of devices	
System	Stand-Alone	Master	Follower
2-line	1	1	9
4-line	1	1	9

The application and settings for the INDULVENT connect are stored on the controller and must be implemented for the required function, which is selected beforehand (by agreement with your Kiefer sales representative): standalone, master or follower with address (1...n).

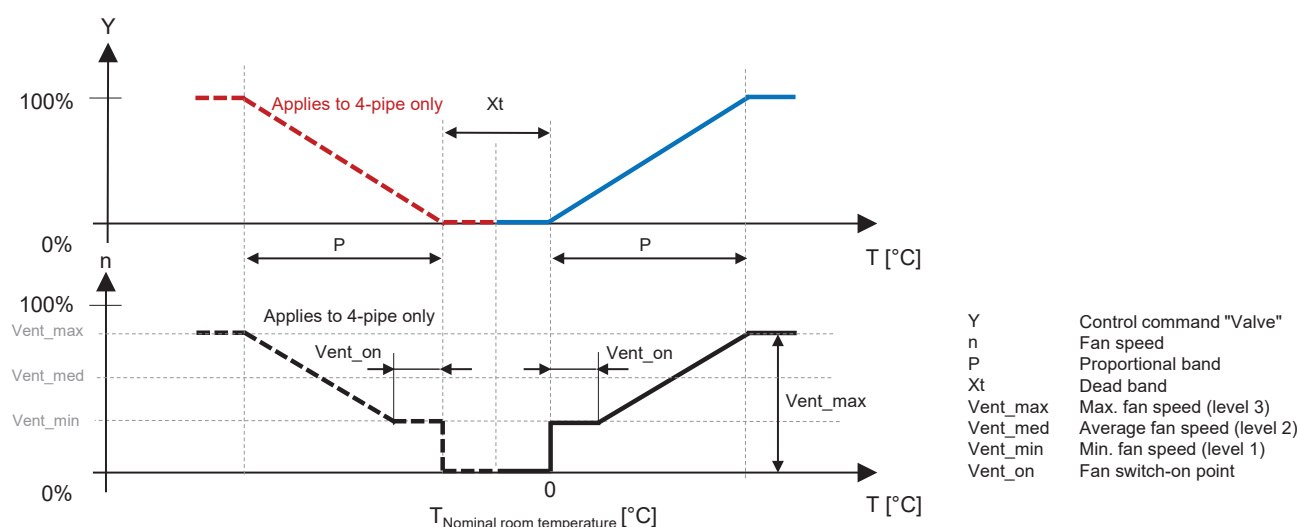
Once a control version has been selected, all of the components required to control the INDULVENT connect are supplied loose with the unit. Wiring and installation of the components is arranged by the customer and must be carried out by qualified personnel.

Control diagram, water – recirculation air

When using the room control unit pre-configured by Kiefer:

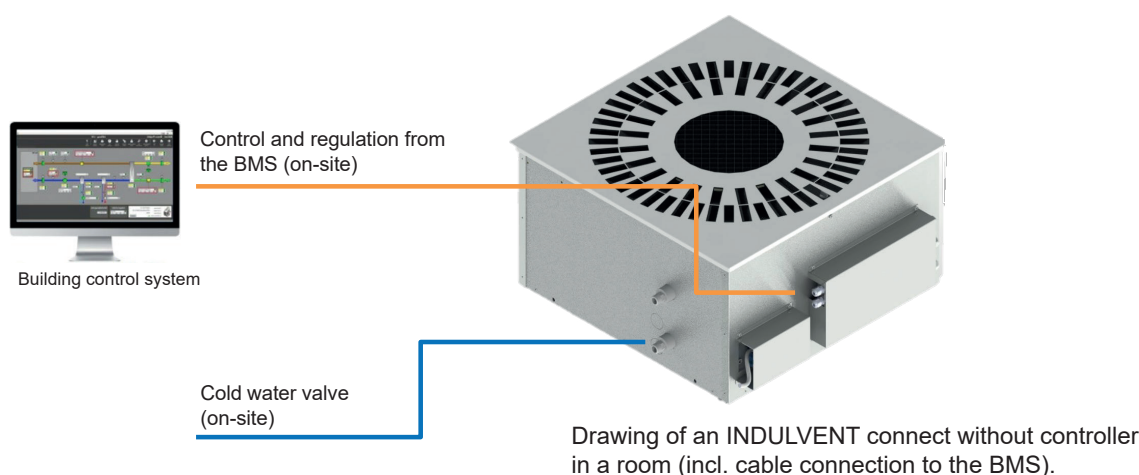
- The air flow rate and fan are controlled via a 0-10 V DC signal (Off, Auto, Eco or stages 1, 2 and 3)
- The coolant can be regulated using a water valve, including a continuous actuator. The actuator (pulse-duration modulation PDM or time proportional integral TPI) is controlled by the room control unit. This causes the valve lifter to be extended and the valve is opened. The valve lifter is retracted at zero voltage and the valve is closed by its own spring.
- When the fan is stationary, the supply of cooling water to the heat exchanger is shut off by the valve.

Control diagram



Control version 3

INDULVENT connect **without a room control unit/controller**; the controls on the air and water sides, and actuation of the unit by the components, must be arranged by the customer. The shut-off valves and actuators can be purchased as options.



If all the relevant functions to control the ambient temperature are adopted from the BMS by the customer, the version without controller is best. In such cases, all electrical connections are combined in the terminal box on the INDULVENT connect for wiring up by the customer.

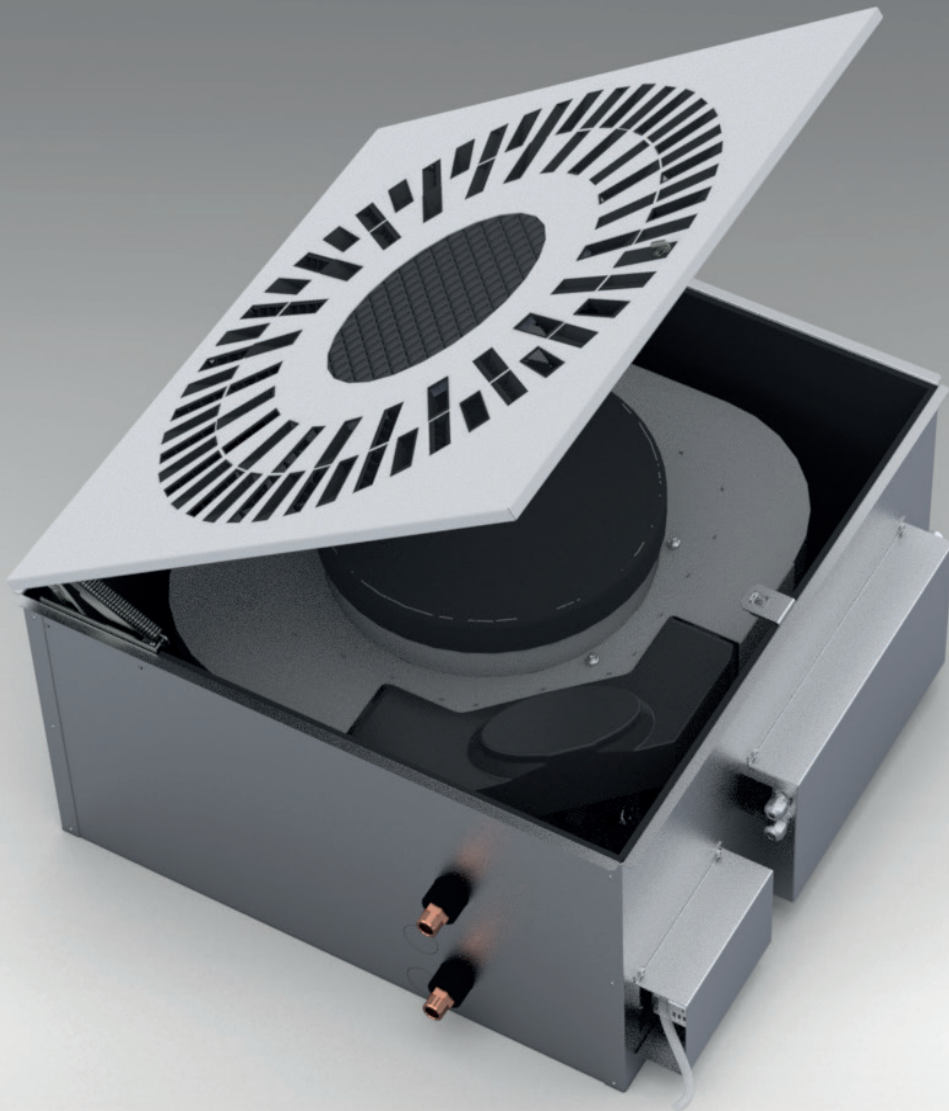
All INDULVENT connect units have a terminal box, which can be used for all three control versions.

Actuation and control principles

Version without controller with terminal box for centralised wiring of all inputs and outputs on the INDULVENT connect by the customer:

In the version with terminal box, the fan of the INDULVENT connect is controlled via an external 0–10 V signal. The corresponding connectors, such as the 230 V connection and the connection for condensate pump alarm messages (floating contact), are combined in the terminal box.

The alarm message must be connected to the BMS so that in the event of a fault and when operating in condensing mode, the condensate pan does not overflow. The cold water valve is closed for this purpose when a fault occurs. In order to dry out the heat exchanger, the fan should continue to run for at least 10 minutes after the unit is shut down or after an alarm message from the condensate pump.



INSTALLATION INFORMATION

COMFORT FAN COIL SYSTEM
INDULVENT connect

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General

Please read the following operating and installation instructions carefully before commissioning the INDULVENT connect. Failure to observe the operating instructions can endanger people and the environment, and void any potential claims. The unit meets all relevant safety regulations. Assembly, installation, maintenance and dismantling may only be carried out by trained personnel. It must be ensured that all such work is performed reliably and safely. Please observe the safety instructions and notes in the installation instructions.



Important!

Always ensure that the unit is operated in accordance with intended use. Failure to observe this requirement can result in damage to the unit and cause hygiene hazards to occur! The maximum water quantity and the water side pressure drop in the cooler can be found on the technical data sheet in the technical Information. Before water is routed into the unit, it is essential to check the flexible water connection hoses for a correct and tight fit.



Danger due to electric current!

It must be possible to isolate the units from the power supply across all poles! All work must be carried out in accordance with national requirements and safety regulations. Wiring, fusing and earthing of the fan must comply with local regulations.



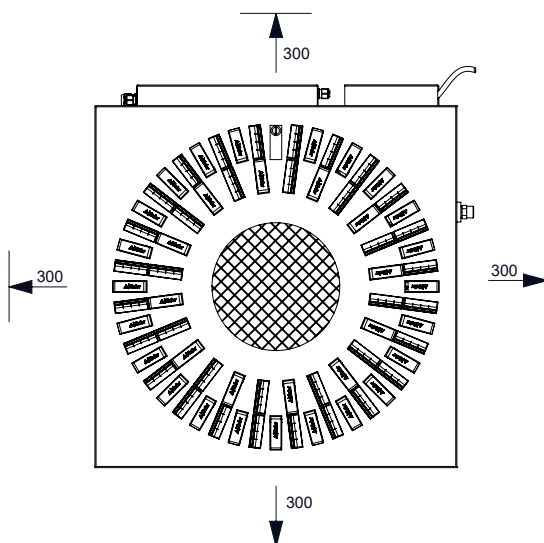
Working on live electrical equipment of the unit is not permissible. Operating the unit when open or dismantled is not permissible.

Installation information, unit suspension and installation

Installation/suspension from a bare ceiling is achieved using threaded rods or easy-span hangers of sufficient size and quantity. The unit must be fitted in such a way as to be freely suspended and stress-free with the possibility to compensate for thermally induced changes in size. Ensure that the unit is aligned horizontally, otherwise voltages may be generated in the front panel shutter. Likewise, ensure that no voltages are transmitted from the adjacent ceiling. The transmission of vibration and structure-borne noise to the building structure must be prevented, as this can lead to acoustic problems. There must be a minimum clearance of 25 mm between the top edge of the unit and the lower edge of the bare ceiling.

Minimum installation clearances

The following minimum installation clearances to other components must be observed to allow maintenance and repair work inside the intermediate ceiling.



Risk of falling parts and tools from work being carried out overhead.

Risk from falling parts! The threaded rods must be fitted securely. Nuts and locking rings must be tightened firmly. The threaded rods must not be bent or distorted in any way.



Danger due to electric current!

Isolate the unit from the power supply before carrying out any work. Ensure that the unit is secured against reconnection at a suitable point in the area of the onsite power supply.



Danger due to rotating parts!

Isolate the unit from the power supply before carrying out any work.

Installing the front plate

1. The front plate is supplied loose. It can be installed on the ground while the fan coil unit is still in its box, or directly on the ceiling.
2. If installing the front plate on the ground, the box must be opened carefully so that the front plate is not scratched or damaged.
3. Before lifting the unit out of the box, we recommend wearing cotton gloves for the installation so that the unit does not get dirty.
4. The front plate can then be lifted out and the hinges to the left and right **carefully** opened up.



Caution! Take care not to crush the fingers when opening the hinges.

5. The four centring rings supplied must be pressed into the holes provided on the outside of the hinges, with the hinges open.

Fig. 1 - Unfold hinges

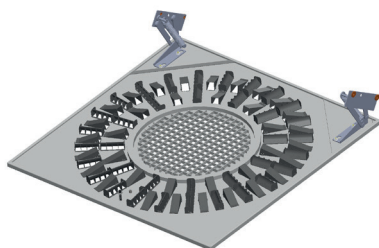


Fig. 2 - Hinges in open position

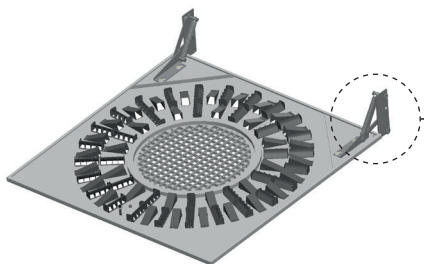
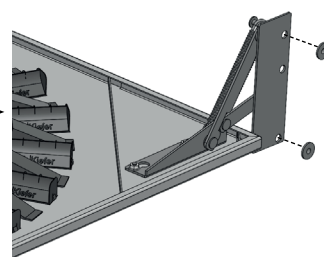


Fig. 3 - Press in the centring rings



6. The front plate is now inserted into the fan coil unit. The hinges are fixed to the unit with the 4 socket head screws (M5, SW3) provided. The position is determined by the existing thread. Observe the starting torque of approx. 2.0–2.2 Nm.

Fig. 4 - Fit two screws and two centring rings per hinge.

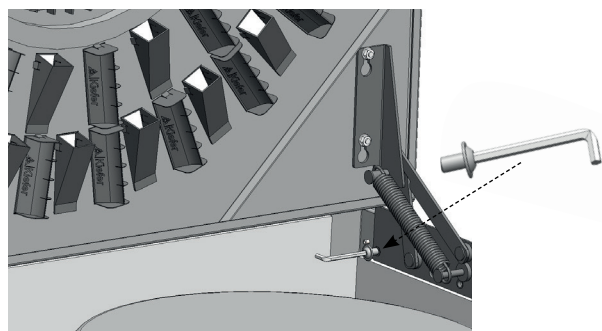
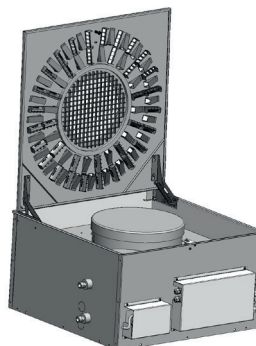


Fig. 5 - Ready-assembled unit



Install the front plate in an open state using an Allen key (SW3).

7. The functions of the front plate should then be tested and it should be checked to ensure that no stresses arise when it is closed.



The front plate must not be attached to the edgefold of the fan coil unit, as damage to the paintwork may occur.

Access hatches

We recommend installation in removable ceiling systems. For installation in closed ceiling systems, adequately dimensioned access hatches should be fitted in the area around electrical connection boxes as well as cold water and condensate connections. All regular maintenance work can then be carried out without opening the intermediate ceiling. To enable replacement of the controller or heat exchanger, however, access to the intermediate ceiling space must be provided, if necessary via a suitable access hatch. The optional straightthrough valve is supplied loose. We are unable to recommend exactly where to fit an access hatch for this.

Controller components

The maximum water quantity and the water side pressure drop in the cooler can be found in the overview in the Technical Information, Part I-8. Mains connection and wiring of all control components, including actuators, must be arranged by the customer according to the enclosed wiring diagram and must be carried out only by qualified personnel.

Fitting and Installation instructions for components delivered with control versions 1 and 2



The operating and installation instructions for the individual components described here are no substitute for proper installation or for studying the manufacturer's data sheets, installation and wiring instructions.

Straight-through valve VVP47

For controlling the water side in a closed circuit, for use with the INDULVENT connect as a 2-line system with a heat exchanger for cooling and as a 4-line system with two separate circuits for heating and cooling.

The valves are supplied individually packed, including installation instructions. Observe the installation position and the direction of flow; see also the valve installation instructions.

Assembly of the straight-through valve and actuator must be arranged by the customer. Junctions and fittings are to be supplied by the customer.

The thermal actuator supplied must be connected according to the wiring diagram. The valve must be closed if there is a fault on the condensate pump or if the unit is shut down, to prevent the formation of condensation.

- ▶ DN 10 connection, G $\frac{1}{2}$ B ";
- ▶ Flat packing male thread connections;
- ▶ KVS = 1 m³/h, nominal flow rate of cold water (5...30 °C) through fully opened valve, with a differential pressure of 100 kPa (1 bar);
- ▶ The maximum permissible differential pressure (closing pressure), against which the valve actuator unit will still close securely, is Δp_S 250 kPa;
- ▶ In combination with the selected electrothermal actuator, this works out at a maximum permissible differential pressure over the control path of the valve for the entire setting range of the valve actuator unit of Δp_{max} 250 kPa.



The valve may be commissioned only with a manual adjustment knob installed in accordance with the regulations, or with an installed actuator.

Electrothermal actuator STP23

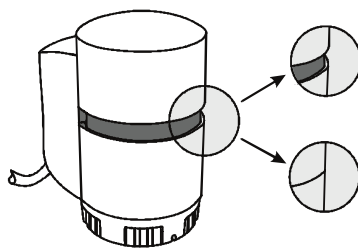
The actuator is silent in operation and is maintenance-free.

When a control input is received, the heating element heats up and expands the solid expansion material. This transfers its force directly to the installed valve. If the heating element is switched on when cold (ambient temperature), after a pre-heating period of approx. 1.5 min the valve begins to open and, after another approx. 2 min (230 V) reaches its maximum distance of travel. When switched off, the expansion element cools down and the valve is closed again by the spring force of the actuator.

This means that the valve lifter is extended and the valve opened. The valve lifter is retracted at zero voltage and the valve is closed by its own spring.

- The actuator in conjunction with the straight-through valve is closed at zero voltage (NC valves).
Without actuation, the valve is closed. The valve lifter is extended;
- Constant control over the water side by pulse-duration modulation PDM/time proportional integral (TPI);
- Actuating force 100 N;
- Actuating signal/time 210 s;

Illustration of position indicator on actuator



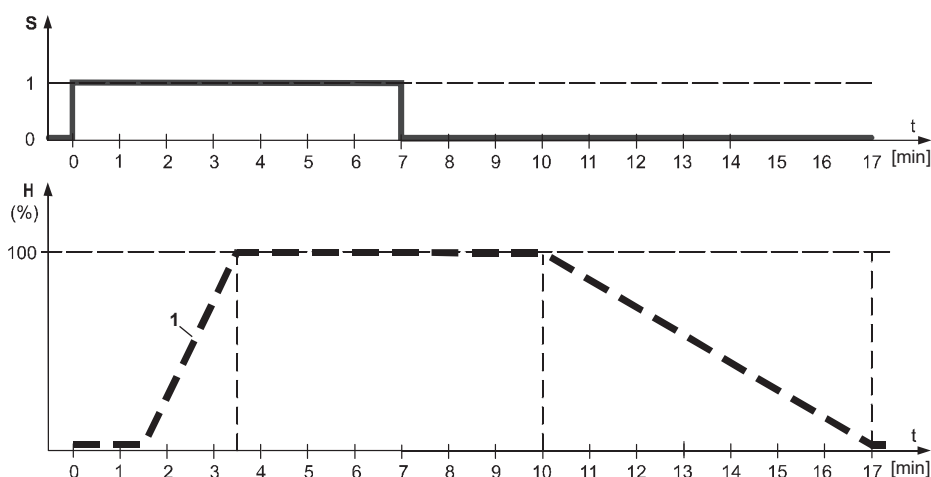
No voltage to actuator

- The valve lifter is retracted.
- The valve is closed.

Voltage to actuator for > 3 minutes

- The valve lifter is extended.
- The valve is opened.

Actuating times (opening/closing)



S Actuating signal
H Travel in %
1 Actuator ST..2.. (AC 230 V)

- Values at 25 °C (ambient temperature)
- The actuation time depends on voltage and ambient temperature

Through the constant actuation applied by the thermal actuator (PDM/TPI signal) on the INDULVENT connect, the runtime is extended.



Pulsdauermodulation/Time Proportional Integral

Electrical connection:

- ▶ Power consumption at 50 Hz in operation 2.5 watts, 58 VA when switched on;
- ▶ Supply operating voltage AC 230 V via two-wire connection;
- ▶ Wire cross-section 2 x 0.75 mm²;
- ▶ Length of connecting cable 1 metre;



Observe the installation and removal instructions, installation positions and notes on electrical installation. These are included in the packaging. Pipe wrenches, spanners and similar must not be used. The actuator must be tightened only by hand.

KNX power supply unit RL 125/23

The decentralised voltage supply produces the system voltage required by the KNX. The unit supplies 80 mA bus current for the KNX line of the INDULVENT connect bus system.

The bus is connected to the choke output voltage via a plug-in low voltage terminal or bus terminal (this is included in the delivery).

The integral choke prevents a short-circuit of the data transfer to the bus line. The decentralised voltage supply has a voltage and current controller and is thus short-circuit proof. It can bridge brief mains power interruptions with a minimum 100 ms buffer time.

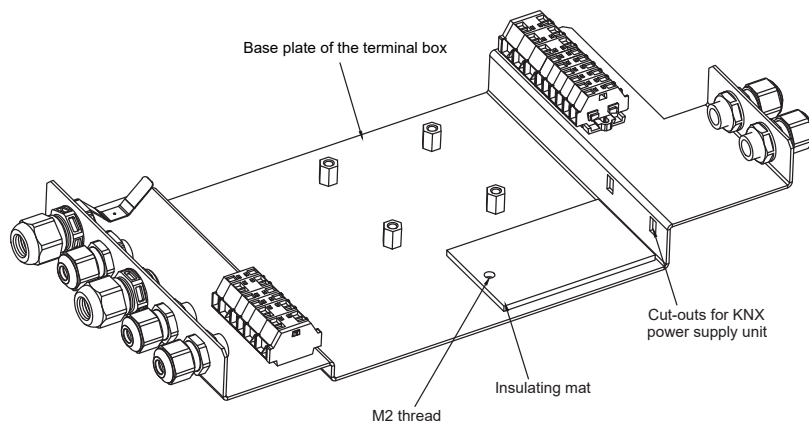
The maximum KNX line length of a bus line is 350 metres with a decentralised voltage supply. If multiple bus subscribers are connected in, for example, a distributor with short line distances (e.g. 10 m), the voltage supply should be close to these bus subscribers. At least one voltage supply is required for each bus line. A second voltage supply is required only if the operating voltage at a subscriber falls below 21 V.

Electrotechnical data:

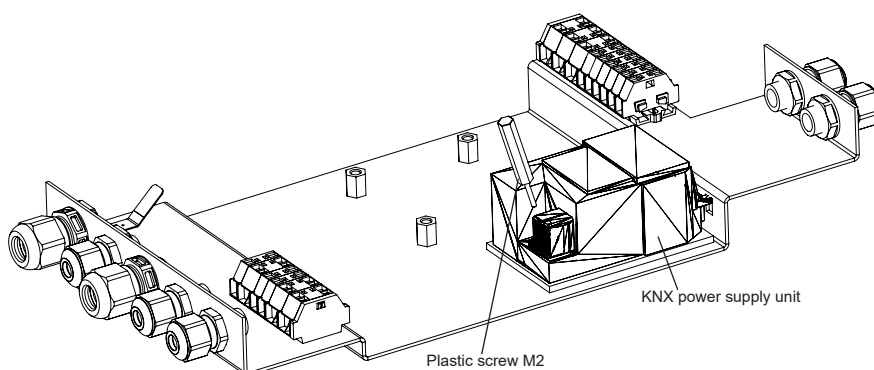
- ▶ The rated operational voltage is AC 230 V, 50...60 Hz.
- ▶ Min. total power loss 1 W (load: 0 A).
- ▶ Max. total power loss 2 W (load: 80 mA).
- ▶ Output voltage DC 29 V, separated extra low voltage (SELV).
- ▶ Output current 80 mA, short circuit current restricted to 0.2 A, buffer time (in case of input voltage failure) ≥ 100 ms at rated current.
- ▶ Rated power consumption approx. 10 VA.
- ▶ Bus line: module bus pin for attaching to the bus terminal, for single-wire conductor with a diameter of 0.6...0.8 mm.

Installing the KNX power supply unit on the INDULVENT connect master unit

1. The insulating mat supplied is affixed to the base panel of the terminal box.



2. The KNX power supply unit is first hooked onto the recesses provided on the base panel of the terminal box and then placed on the insulating mat.



3. The KNX power supply unit should then be secured, using the plastic screw (M2) supplied, to the thread provided on the base panel.
4. The KNX power supply unit must then be wired up.



The unit must be installed and commissioned by an authorised electrical contractor.
Dangerous voltage may be present after shutting off power! Do not touch the electronics on the unit! On a defective unit, the **risk of electric shock may continue to exist** for up to 4 hours even after power has been shut off!
 When planning and installing electrical equipment, the relevant directives, regulations and specifications of the country in question must be observed.
 When live leads are looped through to others, observe that the maximum permissible terminal current of 16 A must not be exceeded.



When installing and wiring up the RL125/23, plugging in or disconnecting the bus terminal, connecting or disconnecting the bus lead and connecting or disconnecting the mains power circuit, note the technical product information supplied with the equipment.

Room control unit RDG200KN with KNX communication technology

Room control unit for controlling the INDULVENT connect with the appropriate (predefined) factory-set parameter settings for use with control versions Standalone, Master or Follower.



Note:

The controller for the INDULVENT connect master unit looks identical to the controller for the INDULVENT connect follower unit.

The room control unit/controller consists of two parts:

- ▶ Plastic casing containing electronics, operating elements and built-in room temperature sensor.
- ▶ Mounting plate with screw fixings.

The housing is hooked onto the mounting plate and secured with two screws.



Functions:

- ▶ Room control unit/controller for use with 2 or 4-line INDULVENT connect.
- ▶ Regulating room temperature via built-in temperature sensor.
- ▶ Operating mode selected via the operating mode selection button on the room control unit.
- ▶ For the 4-line system, changeover between heating and cooling mode (automatically via local sensor).
- ▶ Password-protected parameters (locked as standard).
- ▶ Safety function to prevent water damage (automatic closure of valve when fault detected).
- ▶ Fault/alarm message on room control unit to prevent condensate overflow. The cold water valve closes.

Set value and screen display:

- ▶ Min. and max. limits to set room temperature (comfort limits).
- ▶ Green leaf display function (See Part II-14).
- ▶ Display of current set room temperature in °C.



The basic documentation for the Siemens room control unit type RDG200KN that we have selected can be requested from the manufacturer, Siemens Building Technologies.

The relevant application and parameterisation have been implemented by Kiefer specifically for the INDULVENT connect and cannot be changed, copied or otherwise used without consent.

Fan control:

- ▶ 3-stage or DC 0...10 V fan control.
- ▶ Fan stage selection switches from manual to automatic in order to ensure that the unit operates in an energy efficient manner.

PWM valve control:

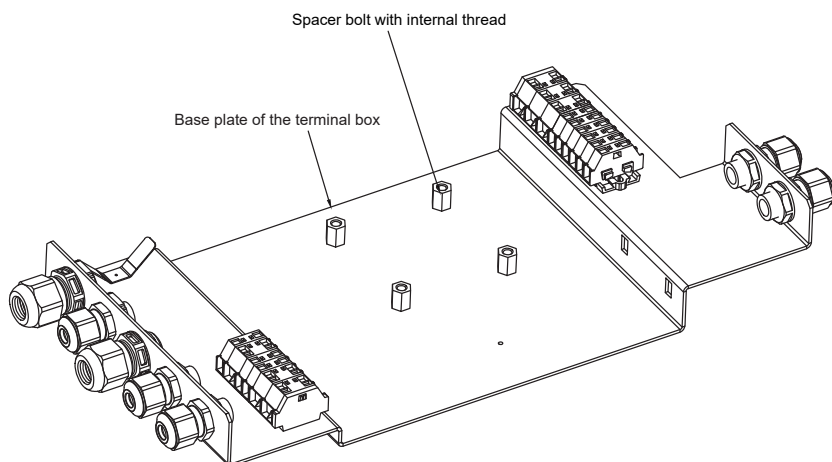
- ▶ The demand calculated by the PI controller on the basis of current ambient temperature and set value is transmitted to the valve actuator as a PWM signal for the thermal actuators via outputs Y1 (for cooling) and Y2 (for heating). The output is enabled for a period proportional to the cooling/heating demand and then disabled for the remaining duration of the PWM interval.

KNX communication:

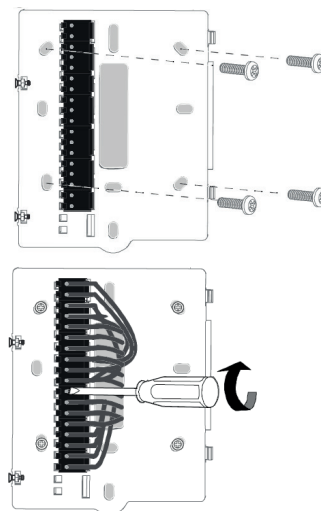
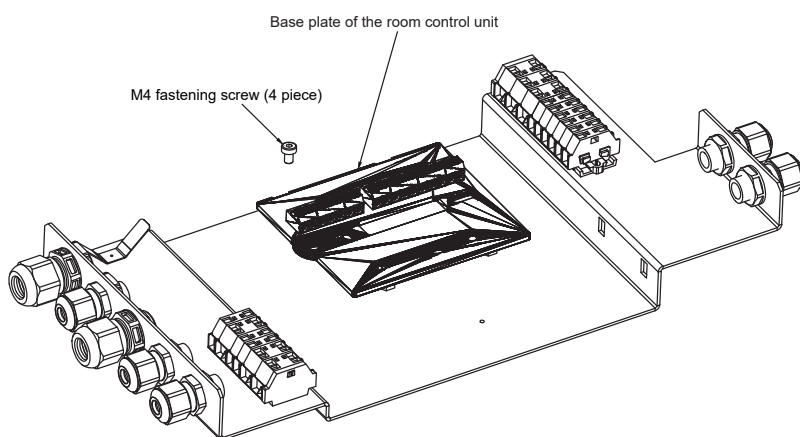
- ▶ KNX bus for internal communication on the INDULVENT connect unit for control version 2.

INSTALLATION INFORMATION

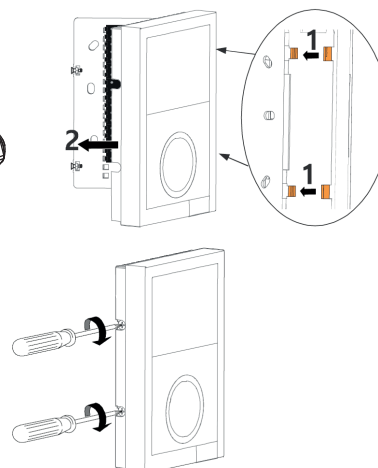
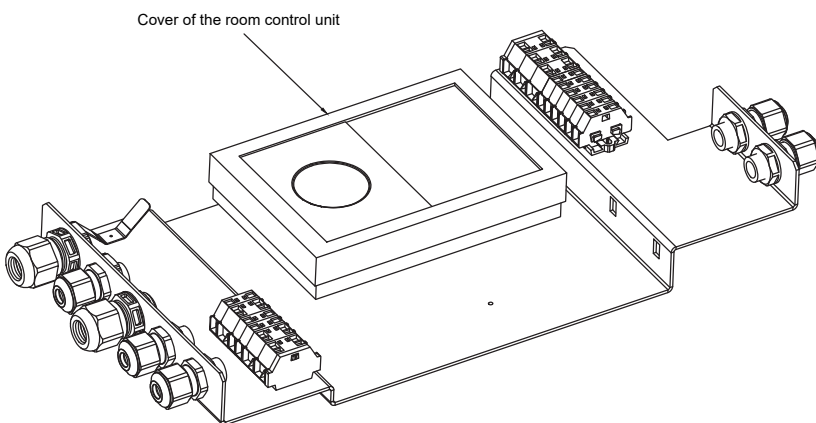
Installing controller (RDG200KN) on the INDULVENT connect follower unit



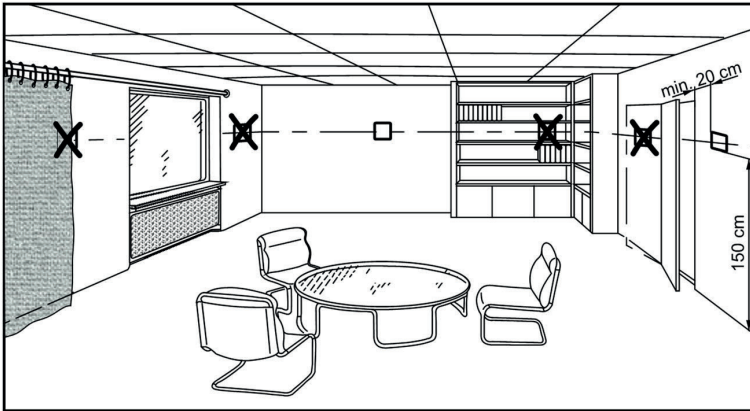
1. The baseplate of the controller (RDG200KN) for the follower unit is fixed to the base panel of the terminal box on the spacer pins provided. The required M4 fastening screws (x4) are enclosed.



2. The cables are then wired up to the appropriate terminals according to the wiring diagram.
3. After the wiring has been completed, the cover of the controller (RDG200KN) for the follower unit is carefully placed onto the baseplate and fixed with the screws located on the baseplate.



Mounting and installation of the room control unit in the room



- ▶ The room control units are suitable for wall installation.
- ▶ Recommended height: 1.5 m above floor level.
- ▶ The room control unit must not be installed in recesses or shelves, behind curtains or above or in the vicinity of heat sources.
- ▶ The room control unit must not be exposed to direct sunlight.
- ▶ Avoid unheated (uncooled) areas of the building such as external walls.
- ▶ Sockets and cabling should be sealed to prevent draughts that might affect sensor measurements.
- ▶ The permissible ambient conditions must be observed.
- ▶ An external room temperature sensor is recommended if the above situation in the installation area is unavoidable. (For this application, a project specific parameter set and the appropriate temperature sensor are required. For further information, please contact your Kiefer representative).



For installing and wiring up the RDG200KN, observe the relevant chapter in the technical product information.

Wiring up the RDG200KN:

- ▶ According to the manufacturer's wiring diagrams.
- ▶ Wiring, fusing and earthing of the room control unit must comply with local regulations.

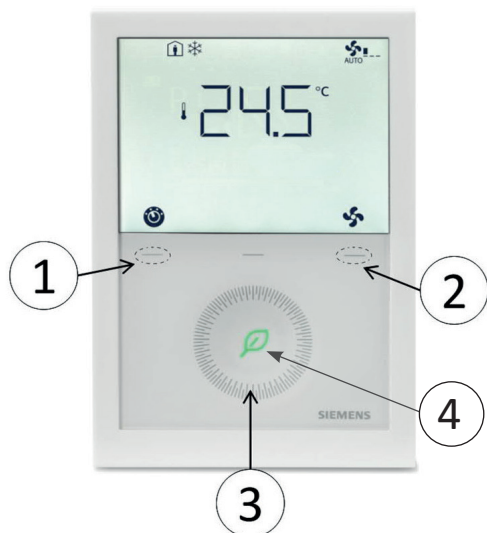


Warning! There is no internal fuse protection for the supply cables to external consumers (Y1 or Y2)! Risk of fire and injury from short circuits!

- ▶ Cable diameters must be selected according to local regulations in relation to the specification of the installed overcurrent protection device.
- ▶ The AC 230 V mains cable must have a rated current of no more than 10 A, supplied via an external protective switch.
- ▶ The cables to the room control unit (RDG200KN), fan and valve actuators carry a mains voltage of AC 230 V and must be sized accordingly.
- ▶ Use only valve actuators rated for AC 230 V corresponding to mains voltage.
- ▶ Input U1-M (float switch/condensate pump alarm): Multiple switches may be connected in parallel. In selecting the rating for this switch, the total maximum contact sensing current must be taken into account.
- ▶ The cable to the U1-M input (float switch/condensate pump alarm) must be fitted with insulation to at least 230 V.
- ▶ Before removing the mounting plate, isolate the room control unit from the mains.

Operating the RDG200 room control unit














Control versions 1 and 2



No.	Symbol	Description
①		Operating mode selector button (On Comfort/Economy/Off)
②		Fan mode selector button (Auto/Stage 1, 2 or 3)
③		Capacitive rotary button for adjusting set room temperature
④		The Green Leaf display is an energy efficient setting and relates to the end-user settings. Green Leaf room temperature set value adjustment within 2 K. Red Leaf room temperature set value adjustment greater than 2 K.

DISPLAY - DESCRIPTION



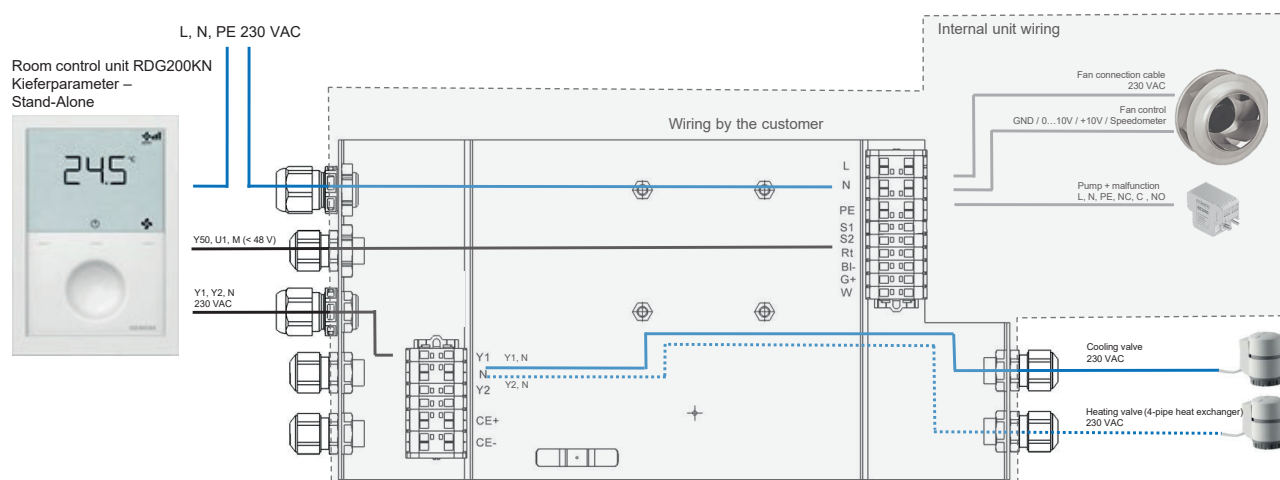
Symbol	Description
	Operating mode selector button (On Comfort/Economy/Off)
	Economy mode (unit is on). In economy mode, the room control unit regulates the temperature to the economy set value.
	Unit is on (comfort mode). In comfort mode, the room control unit regulates the temperature to the comfort set value.
	Unit is off (protective mode)
	Cooling mode (2 and 4-pipe system)
	Heating mode (4-pipe system)
	Fan stage selector button
	Fan automatic
	Fan stage 1
	Fan stage 2
	Fan stage 3
	Float switch/condensate alarm message
	Unit for set temperature display

Actuation and control principles for versions 1 and 2

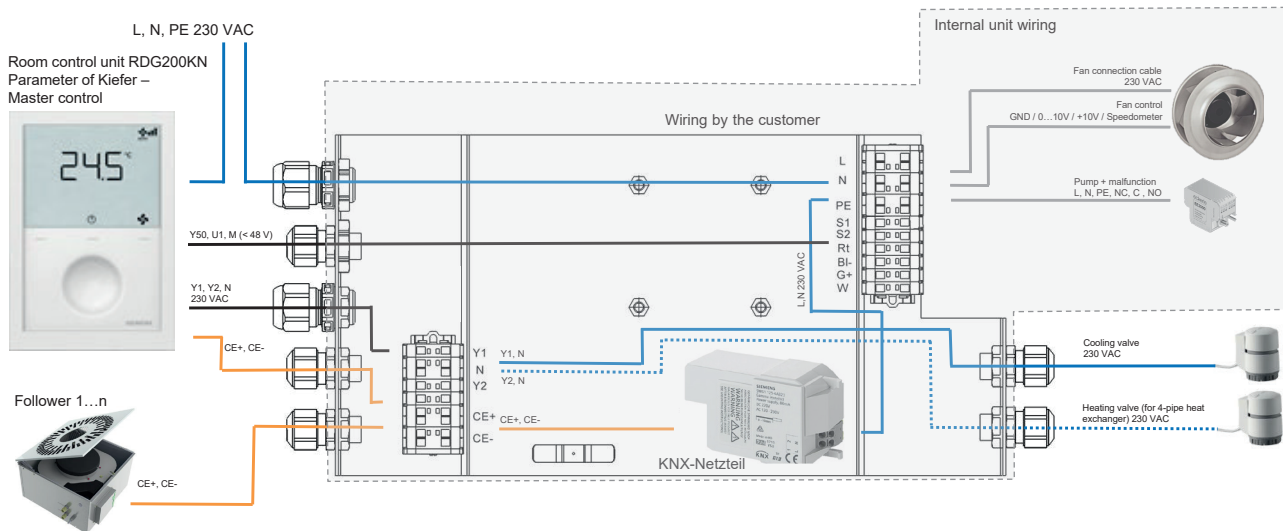
Version with control of variable air flow rates and output control on water side with cooling valve:

- ▶ With the room control unit/controller (RDG200KN) preprogrammed by Kiefer, the ambient temperature is collected via the sensor built into the room control unit and is regulated to the set room temperature by actuating the water valve (PWM) and the fan (0-10 V DC) via a constant control output. The cooling capacity depends mainly on the cooling water flow rate, the supply temperature and the fan speed. The controller adjusts the fan speed and the position of the water valve so that the cooling capacity of the INDULVENT connect meets the current air conditioning requirements. In this way, the INDULVENT connect can minimise energy costs while providing maximum thermal comfort.
- ▶ The INDULVENT connect has an alarm contact that must be wired up to the room control unit so that in the event of a fault on the condensate pump or if the maximum level of condensate in the pan is exceeded, a message can be displayed on the room control unit. In the event of a fault, the controller ensures that the connected water valve will close and the cooling water supply to the heat exchanger will be shut off, to prevent the formation of more condensate, causing the condensate pan to overflow.
- ▶ The thermal actuator supplied with the INDULVENT connect must be connected according to the wiring diagram. In the event of a fault on the condensate pump, the valve will be closed.
- ▶ Once the alarm is resolved, the valve will be opened again automatically.

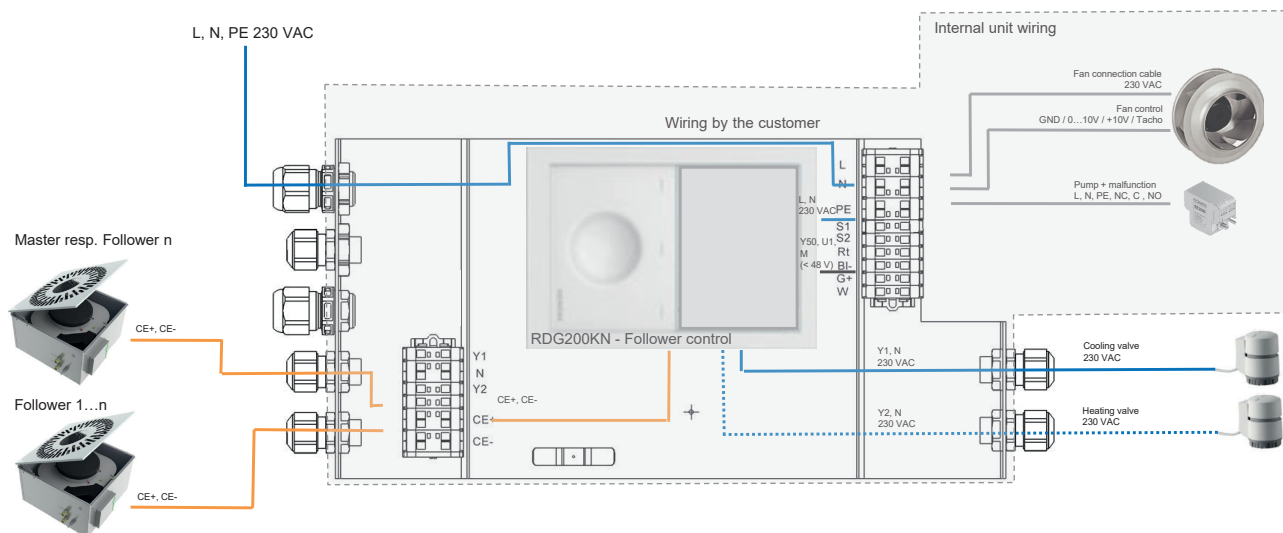
INDULVENT connect version 1 as Stand-Alone with room control unit



INDULVENT connect version 2 as Master

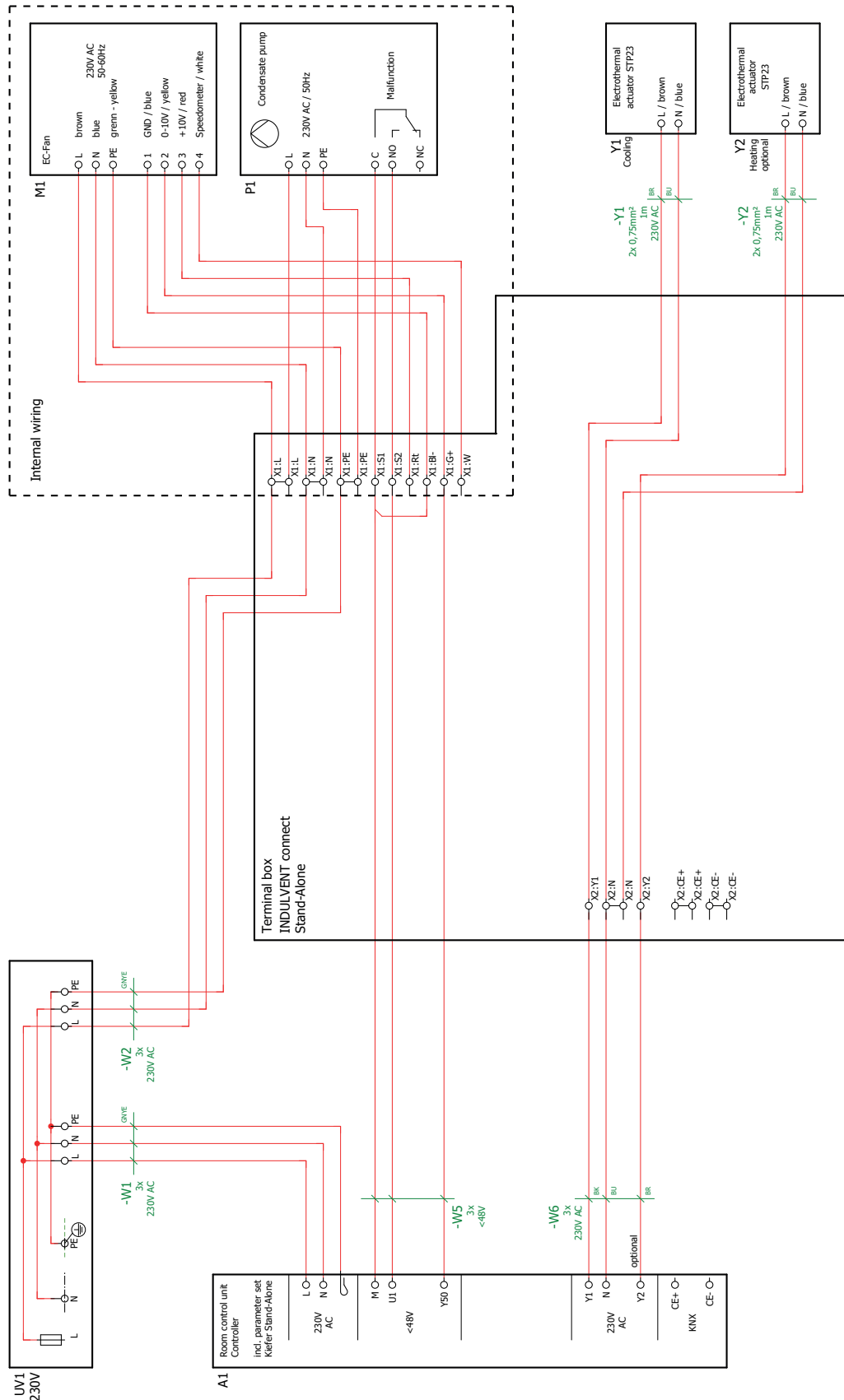


INDULVENT connect version 2 as follower



WIRING DIAGRAM

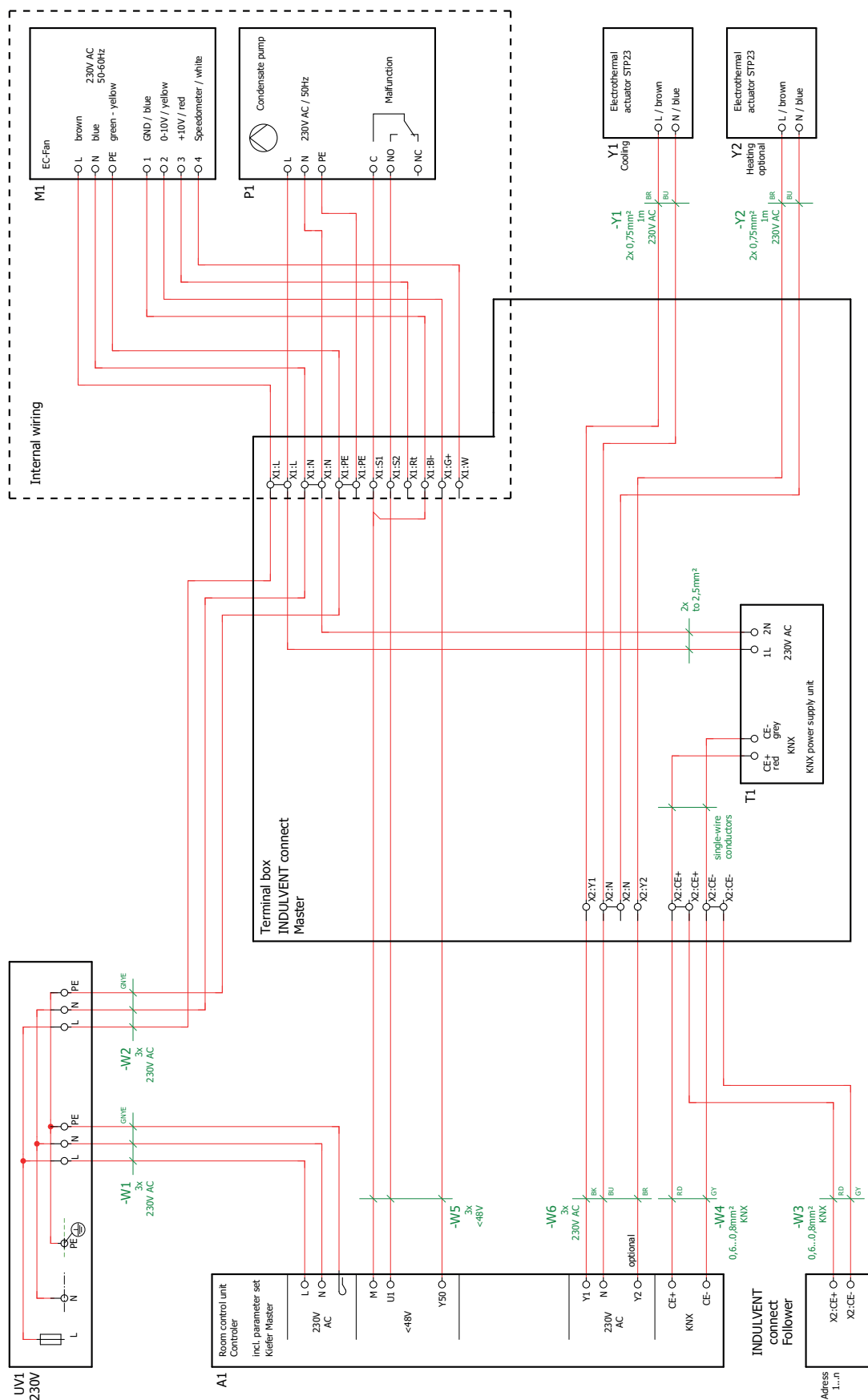
Customer-side wiring version 1 - Stand-Alone



Download wiring diagram
www.kieferklima.de/service/downloads
unter „Technische Informationen“

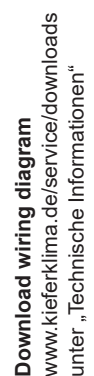
WIRING DIAGRAM

Customer-side wiring version 2 - Master



Download wiring diagram
www.kieferklima.de/service/downloads
unter „Technische Informationen“

Customer-side wiring version 2 - Follower

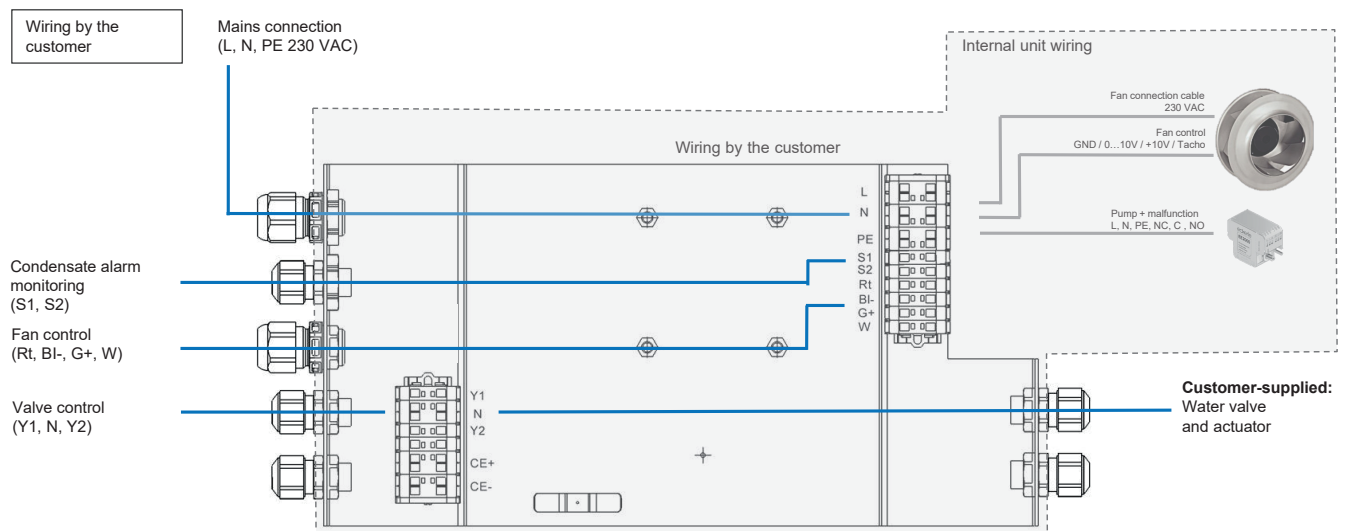


Electrical connections

- ▶ The unit is intended for permanent connection to fixed lines.
- ▶ The INDULVENT connect must be safeguarded with a circuit breaker, tripping characteristic 'C', for the switch-on process.
- ▶ With a control signal of 10 volts, the maximum power consumption of each unit during operation is 40 watts.
- ▶ The cables used for switching the EC motor must be shielded.

Control version 3 without controller

Illustration of terminal box showing customer wiring and connection terminals (fan control/pump fault message/mains connection)



The condensate pump on the INDULVENT connect has a fault message contact (a relay closes if a fault is present on the condensate system).

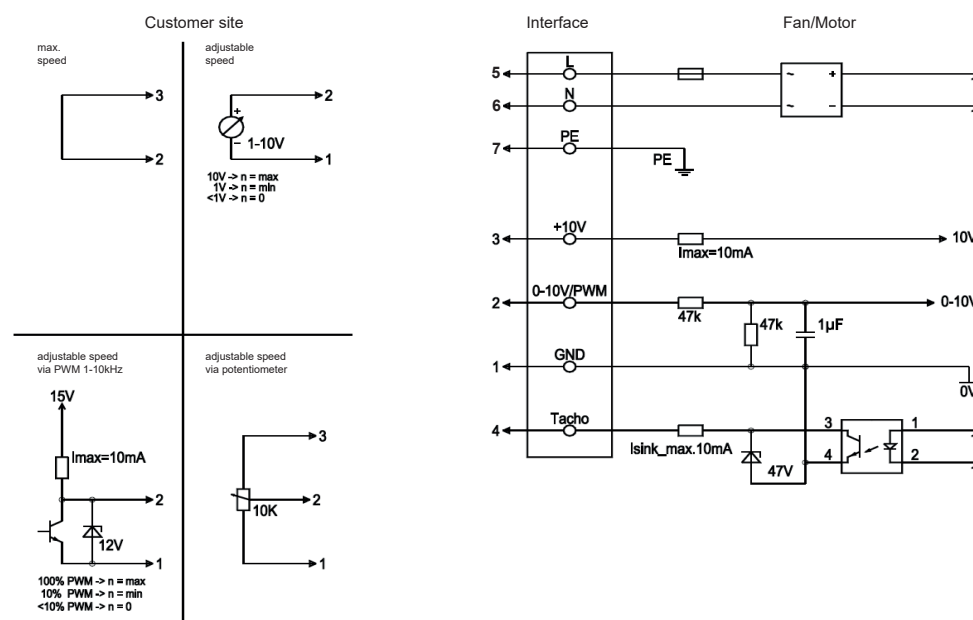
The customer-supplied controller must ensure that the cooling water supply is shut off when the unit is not running.

Terminal box designation	Terminal	Colour	Function/assignment
L	5	Brown	Mains connection, supply voltage, phase, voltage range see type plate
N	6	Blue	Mains connection, supply voltage, neutral wire, voltage range see type plate
PE	7	Green/yellow	Earth connection
S1 ¹		Black	Switch/alarm contact, max. 230 VAC/VDC, max. 8 A under resistive load ²
S2 ¹		Black	Switch/alarm contact, max. 230 VAC/VDC, max. 8 A under resistive load ²
+10 V	3	Red	Fixed voltage output 10 VDC +/- 3 %, I _{max} . 10 mA, continuous short circuit-proof, supply voltage for external appliances (e.g. Poti), SELV
0–10 V PWM	2	Yellow	0–10 V/PWM control input, R _i = 100 kOhm
GND	1	Blue	Reference mass for control interface, SELV
Tacho	4	White	Speed monitoring output: open collector, 1 pulse per revolution, I _{sink} max = 10 mA SELV

¹ Pump fault message

² When fault alarm switch closed

Wiring diagram EC fan

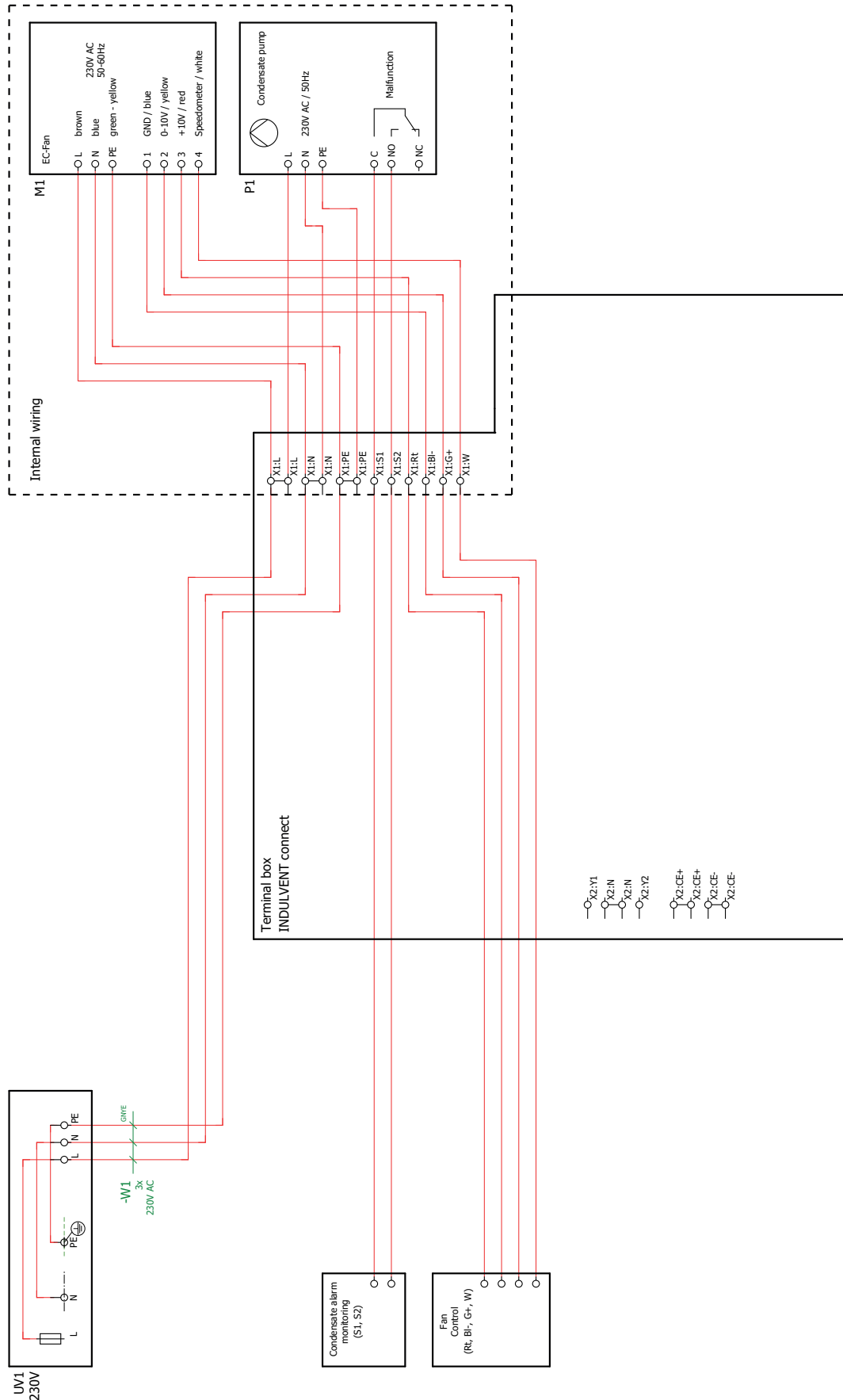


Note:

It is imperative that the switch/alarm contact is connected and monitored by the customer, as the cold water supply to the heat exchanger must be interrupted in the event of a malfunction of the float module in order to prevent condensate from accumulating and consequently overflowing the condensate pan.

WIRING DIAGRAMS

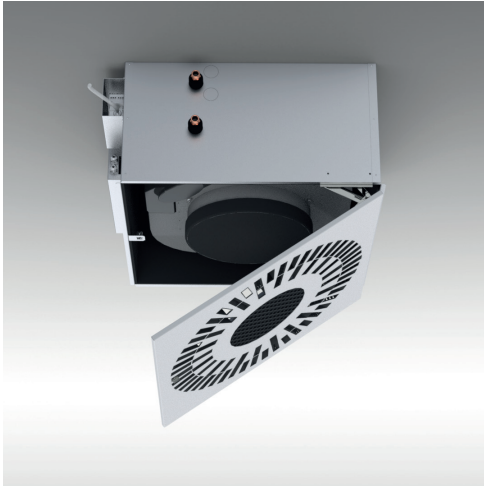
Customer-side wiring version 3 without controller



Download wiring diagram
www.kieferklima.de/service/downloads
under "Technical Information"

Maintenance-friendly access

For ease of maintenance, the front plate has two folding hinges. These hold the front plate and use spring force to press the plate against the foam seal of the housing. To open, unlock the quick-action fastener by turning through 90°, gently lift the front plate away from the box and fold downwards. After completing work on the unit, close the front plate again and lock it with the quick-action fastener.



View of the INDULVENT connect with open front plate

Filter fleece

The condition of the filter fleece must be checked for soiling at regular intervals, at least every 6 months. In the case of heavy soiling, the fleece must be replaced. To do this, open the front plate and replace the fleece, which is attached to the side of the inlet port with hook tape. The filter fleece is available as a spare part. If filter media from other manufacturers are used, reductions in caloric output and increases in sound power may occur.

Floats and float modules

Maintenance: every year before the start of the cooling period. The float module must only be cleaned with an alcohol-free cleaning agent! Carefully remove the module cover to clean the float and float module.

Fan

The fan is maintenance-free. If you nonetheless detect any soiling of the fan impeller surface during the visual inspection, you can wipe it with a damp cloth.

Condensate pan, condensate pump float module and condensate line

The soiling on these components depends on the degree of contamination in the ambient intake air as well as the amount of condensate produced. The INDULVENT connect is normally used primarily in the summer months. Condensate is produced at this time due to the higher relative humidity of the outdoor air. We therefore recommend that the relevant condensate drain components be cleaned before the start of the cooling period. The components should be inspected visually in the middle of the cooling period. Additional cleaning may be required. Clean the condensate pan with a slightly damp cloth and a commercially available neutral cleaning agent. For this purpose, open the front plate and undo the four nuts using a size 10 spanner.

To clean the components, remove the sheet metal panel connected to the condensate pan by pulling it down and out of the unit. Be aware that there may still be water in the condensate pan. The condensate pump itself is maintenance-free. However, the associated float module must be cleaned regularly to ensure reliable operation. Heavily soiled float modules can get stuck and cause the condensate pan to overflow. Damage caused by soiling of the float module therefore does not constitute grounds for complaint. After successfully dismounting the condensate pan, separate the float module cable from the condensate pump via a plug-in system. Now remove the float module from the retaining bracket, rinse it with clear water and put it back in place. In order to ensure reliable condensate drainage, ensure that the condensate line does not become clogged with deposits.

You should therefore perform a visual inspection of the transparent condensate hose. If deposits are detected, the hose must also be flushed or replaced if necessary. Once cleaning is completed, refit all components correctly. When refitting the float switch, ensure that the cable leading to the pump is fixed to the float module with a cable binder to form a siphon-like loop (see image).



Once the float module has been fitted, the power cable of the float module must be fixed to the condensate drain hose using cable binders.

You then need to check that the condensate pump is functioning properly by adding water to the condensate pan.



Note!

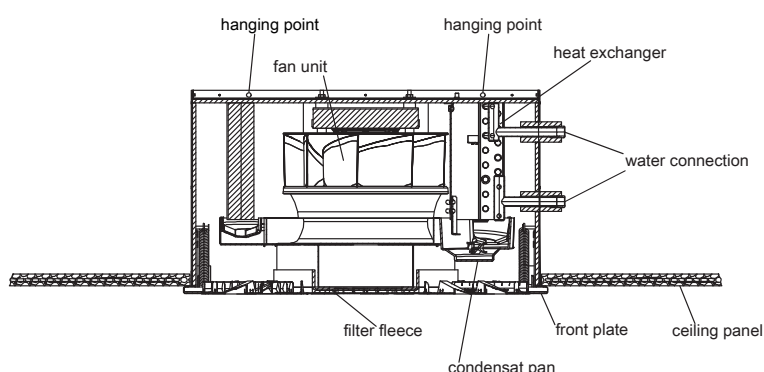
Please note that maintenance work may only be carried out when the unit is isolated from the power supply!

Maintenance intervals

The maintenance intervals specified below are scheduled as per VDI 6022. The maintenance interval must be shortened if the level of soiling is particularly high.

Performed by	No.	Task	Action if required	Interval – no. of months		
				3	12	24
Trained cleaning personnel	A	Spot-check units for soiling	Clean and repair unit (housing, front plate, fan)		X	
	B	Change filter			X	
	C	Clean heat exchanger	Clean and repair	X		
	D	Spot-check all other components through which secondary air flows	Clean and repair		X	
Qualified personnel only	E	Hygiene inspection				X
	F	Check unit for damage and corrosion	Clean or replace		X	
	G	Check fan for soiling, damage and corrosion				X

Individual components in the INDULVENT connect 2-pipe



Safety instructions

The cold water connection is made via two connection pipes with a ½" male thread mounted on the heat exchanger.

- ▶ When making the cold water connection, always counterhold the connection pipe with a hex tool to prevent damage to the inner line routing, for example by twisting off.
- ▶ Shut-off valves must be provided in the supply and return for service purposes.
- ▶ Optional regulating valves must be installed to ensure correct adjustment of the water mass flow rate.
- ▶ An air vent valve must also be provided in the supply at the highest installation point.
- ▶ The cold water connections must not exert any load on the unit. The connection to the cold water tubing must therefore be made using a flexible connector.
- ▶ The manufacturer's instructions for both the actuator and valve must be observed at all times.
- ▶ The valve group and supply lines must be insulated with vapour diffusion-proof material for condensing operation.
- ▶ The maximum operating pressure of the heat source is 10 bar.



Once the unit is completely isolated from the power supply (mains voltage), the cold water supply needs to be interrupted. Otherwise the unit may be damaged due to overflowing condensate.

- ▶ We recommend:
Use the operating status relay to control the through valve; this ensures that the cold water supply is only active when the unit is running (PART II-5). A suitable ½" through valve with thermal actuator is available as an optional accessory.

Cold water connection



The hoses and connections of the heat exchanger must be checked for damage before connecting them to the water network.

Work may only be carried out on water connections when the unit is isolated from the power supply. After proper connection and before water is introduced, the connecting points must be tested for leaks.



Danger due to cutting edges!
Sharp-edged heat exchanger fins and housing parts.



Assembly, installation, maintenance and dismantling may only be carried out by trained personnel. It must be ensured that all such work is performed reliably and safely.

Explanations of symbols and notes



This symbol can be found in all occupational safety instructions in this operating manual where there is a danger to life and limb. These instructions must be observed and require that work be performed with utmost caution. Occupational safety instructions must be passed on to users. Apart from the instructions in this operating manual, the generally applicable safety and accident prevention regulations must also be observed.



Risk of overhead hazard!

Indicator of a risk due to an overhead hazard, which can result – for example during maintenance work – in personal injury, including death, and in material damage.



Topics in the operating manual which are particularly relevant and require special attention for reasons of safety and service life of the unit. Directives, regulations and instructions must be complied with here. Examples of such topics include damage to the unit or building services.



Risk of cuts!

Here you will find special information, instructions and prohibitions designed to prevent personal injury from cuts on metal panels. Indicator of a danger due to sharp edges.



General mandatory action sign for occupational safety and accident prevention. Compliance is compulsory due to various residual risks. Examples include wearing protective gloves, protective goggles and safety helmets.



Risk of falling parts and tools from work being carried out overhead.



Wear a safety helmet.



Danger due to electric current!

Indicator of a risk of electric shock, which can result in personal injury, including death, and in material damage.



Danger due to rotating parts!

Indicator of a danger due to rotating parts of the unit, which can result in personal injury, including death, and in material damage.



Risk due to hot surfaces!

Indicator of a danger due to hot surfaces which can cause burns.

Safety instructions



In continuous operation, the motor can heat up to approx. 70 °C. The motor must be left to cool sufficiently before it is touched.



Installation, servicing, maintenance work and repairs may only be carried out by trained and qualified personnel. In the event of damage, parts of the unit in and on the housing may be live. In line with local safety regulations, only authorised people with appropriate training and qualifications are permitted to establish, disconnect and remove or change electrical connections. All safety instructions and mandatory action signs in the operating manual and on the unit must be observed. The access hatch on the side of the unit may only be opened for cleaning, maintenance or repairs after electrical isolation. The power connection and control voltage connection must be established in accordance with the wiring diagram. It is forbidden to operate the unit in a partially fitted or partially opened state, as earth connections may have been interrupted.



Danger due to sharp edges!

Risk of cuts from sheet metal.

Sharp-edged heat exchanger fins and housing parts.



Objects and dirt must not be allowed to enter the fan impeller. A damaged impeller and the ejection of objects by the impeller can endanger people and shorten the service life of the unit.



The front plate must not be opened during operation. The units and suspension brackets must not be subjected to any additional load, as they may not be strong enough for this. If any damage caused by liquids, mechanical effects, corrosion, fire or similar is detected, the unit may only be restarted after adequate inspection by appropriate technical personnel. If any damage is detected, a specialist technician must immediately isolate the unit from the power supply across all poles and shut off the water supply to the unit. If any damage or soiling is present, this must be reported immediately to the responsible department. This also applies to unusual operating noises and odours.

Intended use

The INDULVENT connect ceiling fan coil system is used for cooling and heating indoor areas.

The unit is designed for condensing operating mode. It is therefore essential to ensure that the condensate can be drained off via the integrated condensate pump. This requires a connection to an appropriate sewage system and, if necessary, integration into the BMS (condensate pump fault message).

The INDULVENT connect must not be used as a safety-related component or for performing any safety-relevant function.

Please observe the permissible operating and ambient conditions (see Part I-8).

All information contained in these operating and maintenance instructions is based on the currently applicable standards and regulations, as well as the latest engineering standards.

The manufacturer accepts no liability for damage caused by:

- ▶ Incorrect use
- ▶ Failure to observe these instructions
- ▶ Installation and operation by untrained technical personnel
- ▶ Technical changes to/tampering with the unit
- ▶ Failure to observe maintenance intervals
- ▶ Use of non-approved spare parts

TRANSPORT INSTRUCTIONS, DELIVERY AND STORAGE

Transport instructions and delivery

The units are supplied in stable transport packaging. The installation and/or control accessories are supplied in a separate cardboard box.

Storage / inbound delivery

The recipient at the delivery location must check the units for damage immediately on arrival. Any damage found must be recorded on the delivery note. The haulier and the relevant contractual partner must be notified immediately if any damage is discovered or any parts on the delivery note are missing. Subsequent complaints cannot be considered.

Packaged products must be transported and stored as follows:

- ▶ Fully protected from weather conditions and humidity/moisture, i.e. do not keep or store products outdoors
- ▶ Transport and store products in dry, dust-free ambient conditions
- ▶ Do not expose products to corrosive or aggressive media
- ▶ Protect products from direct sunlight
- ▶ Storage temperature: 5 °C to 50 °C

In order to prevent contamination of and damage to the unit, the packaging and protective film (if present) must not be removed until immediately before commissioning.

▶ Note:

Moisture and temperature effects can cause the dimensions of the material to change. We recommend storing the cardboard boxes for 2 to 3 days in the room where they will be used, before proceeding further.



The cardboard packaging and protective films serve to protect the unit from dirt and damage and must not be removed during the construction phase! The manufacturer accepts no liability for soiling of or damage to the unit.

Disposal, environmental protection and recycling

All products are packaged carefully in environmentally friendly materials. The packaging material must be disposed of in accordance with local regulations.

Declaration of conformity

<u>EC/EU declaration of conformity</u>	
according to the Machinery Directive 2006/42/EC of 17 May 2006, Annex II, Part 1, Section A and the EU Directive 2014/30/EU (electromagnetic compatibility) of 26 February 2014.	
We hereby declare that the machine designated below meets the relevant provisions of the EC Machinery Directive 2006/42/EC and the EMC Directive.	
Manufacturer:	Kiefer Klimatechnik GmbH Heilbronner Straße 380 70469 Stuttgart
Machine:	Ventilation unit
Type:	INDULVENT connect
<u>Relevant EC directives and regulations:</u>	
Directive 2006/42/EC, OJ L 157/24 of 17.05.2006 (Machinery Directive) Directive 2014/30/EU, OJ L 96/79 of 26.2.2014 (EMC Directive)	
<u>Applicable harmonised standards, in particular:</u>	
DIN EN ISO 12100:2011-03; DIN EN ISO 13857:2020-04; DIN EN 61000-6-2:2016-05; DIN EN 61000-6-3:2011-09; DIN EN 60335-1:2020-08; DIN EN 349:2008-09	
<u>Other national standards, guidelines and technical specifications:</u>	
DIN EN 82079-1 VDI 6022 Part 1: 2018-01 RLT-Guideline 03; August 2016	
Manufacturer's signature	
Stuttgart, 26.10.2021	Clemens Kiefer Managing Director
Place, date	i.V. Daniel Nack Head of Research and Development
	Signature
	Signature

Product range

Components:

Linear diffusers, wall passages, ceiling diffusers and displacement outlets, chilled ceilings, light and acoustic sails, recirculation cooling units, transfer grilles, concrete core cooling with supply air. Axial, radial and hot gas fans.

Systems:

Ventilation systems of all kinds for comfort (in offices, department stores, hospitals, libraries, museums, etc.) and industry (mechanical engineering, high-tech, textiles, plastics, chemicals, automotive, beverages, food industry, etc.).

Services

Consulting and planning:

We advise on all questions regarding the use of our systems and prepare system studies and cost estimates with calculations of the cooling load / piping networks / energy costs / economic efficiency. Preparation of structural proposals for air distribution, lighting and ceiling systems. Lighting calculations using state of the art software tools. Development and implementation of control concepts in our own ICE (instrumentation & control engineering) department. We apply the knowledge we have gained from numerous construction projects to product innovations and new projects.

Air conditioning laboratory:

Expert reports; ambient air flow analyses in the laboratory in 1:1 tests. Acoustic and aerodynamic investigation of ventilation components. Development of innovative air conditioning components. Caloric output measurement of air or water components on the test bench. On-site comfort measurements to assess thermal comfort and ambient air quality.

Maintenance and servicing

of all types of ventilation and air conditioning systems within the framework of maintenance service contracts.



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All earlier versions of this technical Information lose their validity with the publication of this document.