

Assembly and operating instructions

REMKO KWD 25, KWD 35, KWD 45, KWD 55,

KWD 70, KWD 85, KWD 100

Chilled water ceiling cassettes - dual conductor version





Read these operating instructions carefully before commissioning / using this device!

These instructions are an integral part of the system and must always be kept near or on the device.

Subject to modifications; No liability accepted for errors or misprints!

Installation and operating instructions (translation of the original)

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1 Safety and usage instructions

1.1 General safety notes

Carefully read the operating manual before commissioning the units for the first time. It contains useful tips and notes such as hazard warnings to prevent personal injury and material damage. Failure to follow the directions in this manual not only presents a danger to people, the environment and the system itself, but will void any claims for liability.

Keep this operating manual and the refrigerant data sheet near to the units.

1.2 Identification of notes

This section provides an overview of all important safety aspects for proper protection of people and safe and fault-free operation. The instructions and safety notes contained within this manual must be observed in order to prevent accidents, personal injury and material damage.

Notes attached directly to the units must be observed in their entirety and be kept in a fully legible condition.

Safety notes in this manual are indicated by symbols. Safety notes are introduced with signal words which help to highlight the magnitude of the danger in question.



DANGER!

Contact with live parts poses an immediate danger of death due to electric shock. Damage to the insulation or individual components may pose a danger of death.



DANGER!

This combination of symbol and signal word warns of a situation in which there is immediate danger, which if not avoided may be fatal or cause serious injury.



WARNING!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may be fatal or cause serious injury.



CAUTION!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may cause injury or material and environmental damage.



NOTICE!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may cause material and environmental damage.



This symbol highlights useful tips and recommendations as well as information for efficient and fault-free operation.

1.3 Personnel qualifications

Personnel responsible for commissioning, operation, maintenance, inspection and installation must be able to demonstrate that they hold a qualification which proves their ability to undertake the work.

1.4 Dangers of failure to observe the safety notes

Failure to observe the safety notes may pose a risk to people, the environment and the units. Failure to observe the safety notes may void any claims for damages.

In particular, failure to observe the safety notes may pose the following risks:

- The failure of important unit functions.
- The failure of prescribed methods of maintenance and repair.
- Danger to people on account of electrical and mechanical effects.

1.5 Safety-conscious working

The safety notes contained in this manual, the existing national regulations concerning accident prevention as well as any internal company working, operating and safety regulations must be observed.

1.6 Safety notes for the operator

The operational safety of the units and components is only assured providing they are used as intended and in a fully assembled state.

- The units and components may only be set up, installed and maintained by qualified personnel.
- Protective covers (grille) over moving parts must not be removed from units that are in operation.
- Do not operate units or components with obvious defects or signs of damage.
- Contact with certain unit parts or components may lead to burns or injury.
- The units and components must not be exposed to any mechanical load, extreme levels of humidity or extreme temperature.
- Spaces in which refrigerant can leak sufficient to load and vent. Otherwise there is danger of suffocation.
- All housing parts and device openings, e.g. air inlets and outlets, must be free from foreign objects, fluids or gases.
- The units must be inspected by a service technician at least once annually. Visual inspections and cleaning may be performed by the operator when the units are disconnected from the mains.

1.7 Safety notes for installation, maintenance and inspection

- Appropriate hazard prevention measures must be taken to prevent risks to people when performing installation, repair, maintenance or cleaning work on the units.
- The setup, connection and operation of the units and its components must be undertaken in accordance with the usage and operating conditions stipulated in this manual and comply with all applicable regional regulations.
- Local regulations and laws such as Water Ecology Act must be observed.
- The power supply should be adapted to the requirements of the units.
- Units may only be mounted at the points provided for this purpose at the factory. The units may only be secured or mounted on stable structures, walls or floors.
- Mobile units must be set up securely on suitable surfaces and in an upright position. Stationary units must be permanently installed for operation.
- The units and components should not be operated in areas where there is a heightened risk of damage. Observe the minimum clearances.

- The units and components must be kept at an adequate distance from flammable, explosive, combustible, abrasive and dirty areas or atmospheres.
- Safety devices must not be altered or bypassed.

1.8 Unauthorised modification and changes

Modifications or changes to units and components are not permitted and may cause malfunctions. Safety devices may not be modified or bypassed. Original replacement parts and accessories authorised by the manufacturer ensure safety. The use of other parts may invalidate liability for resulting consequences.

1.9 Intended use

Depending on the model and the equipment, the units are only intended to be used as a cold water drain to cool or warm the operating medium water or a water-glycol mixture within a closed medium cycle.

Any different or additional use is a non-intended use. The manufacturer/supplier assumes no liability for damages arising from non-intended use. The user bears the sole risk in such cases. Intended use also includes working in accordance with the operating and installation instructions and complying with the maintenance requirements.

The threshold values specified in the technical data must not be exceeded.

1.10 Warranty

For warranty claims to be considered, it is essential that the ordering party or its representative complete and return the "certificate of warranty" to REMKO GmbH & Co. KG at the time when the units are purchased and commissioned.

The warranty conditions are detailed in the "General business and delivery conditions". Furthermore, only the parties to a contract can conclude special agreements beyond these conditions. In this case, contact your contractual partner in the first instance.

1.11 Transport and packaging

The devices are supplied in a sturdy shipping container. Please check the equipment immediately upon delivery and note any damage or missing parts on the delivery and inform the shipper and your contractual partner. For later complaints can not be guaranteed.



WARNING!

Plastic films and bags etc. are dangerous toys for children!

Why:

- Leave packaging material are not around.
- Packaging material may not be accessible to children!

1.12 Environmental protection and recycling

Disposal of packaging

All products are packed for transport in environmentally friendly materials. Make a valuable contribution to reducing waste and sustaining raw materials. Only dispose of packaging at approved collection points.



Disposal of equipment and components

Only recyclable materials are used in the manufacture of the devices and components. Help protect the environment by ensuring that the devices or components (for example batteries) are not disposed in household waste, but only in accordance with local regulations and in an environmentally safe manner, e.g. using certified firms and recycling specialists or at collection points.



2 Technical data

2.1 Unit data

Series		KWD 25	KWD 35	KWD 45	KWD 55
Operating mode		Chilled water ceiling cassette, Euroraster format, 2-conductor version			
Nominal cooling output ¹⁾	kW	2.71	3.34	4.32	5.40
Nominal cooling output, sensitive ¹⁾	kW	1.92	2.37	3.06	3.83
Nominal heat capacity ²⁾	kW	3.52	4.34	5.62	6.90
Application area (room volume), approx.	m ³	70	90	120	150
Adjustment range, room temp.	°C	+16 to +30			
Operating range - indoor unit	°C	+15 to +35			
Air flow volume per stage	m ³ /h	375/400/420/ 445/490	395/420/440/ 490/520	455/500/520/ 565/650	550/620/665/ 740/885
Sound pressure level ³⁾	dB (A)	27/29/32/34/ 35	29/31/32/33/ 35	31/33/35/37/ 39	34/36/38/40/ 42
Power supply	V/Hz	230 / 1~ / 50			
Enclosure class	IP	X0			
Electr. rated power consumption ¹⁾	kW	0.04	0.04	0.07	0.09
Electr. rated current consumption ¹⁾	A	0.20	0.24	0.35	0.44
Operating medium		Water; max. 35 % ethylene-glycol, max. propylene-glycol max. 35 %			
Operating limits, medium - cooling	°C	+4 to +18			
Operating limits, medium - heating	°C	+35 to +70			
Max. operating pressure, medium	kPa	1400			
Min. supply temp., heating	°C	+40			
Nom. flow rate, medium - cooling ¹⁾	m ³ /h	0.53	0.57	0.75	0.84
Nom. flow rate, medium - heating ¹⁾	m ³ /h	0.53	0.57	0.75	0.84
Rated pressure drop, internal ¹⁾	kPa	15	18	25	20
Rated pressure drop, internal ²⁾	kPa	15	18	25	20
Medium connection, inlet	Inches	3/4 internal			
Medium connection, outlet	Inches	3/4 internal			
Medium volume	l	1.30			1.79
Condensate drainage connection	mm	19			
Condensate pump, flow rate, max.	mm WS	1000			

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Series		KWD 25	KWD 35	KWD 45	KWD 55
Dimensions					
Height	mm	258			298
Width	mm	570			
Depth	mm	570			
Cover dimensions					
Height	mm	28			
Width	mm	650			
Depth	mm	650			
Weight	kg	28.0			31.0
Operating weight, approx.	kg	29.3			32.8
Serial number		1504...	1505...	1506...	1507...
EDP		1611860	1611862	1611864	1611866

¹⁾ Air inlet temperature TK 27 °C / FK 19 °C, medium inlet 12 °C, medium outlet 7 °C, 0 % glycol concentration, max. air flow volume

²⁾ Air inlet temperature TK 20 °C, medium inlet 50 °C, nominal flow rate as in cooling mode, 0 % glycol concentration, max. air flow volume

³⁾ Distance 1 m free field

Series		KWD 70	KWD 85	KWD 100
Operating mode		Chilled water ceiling cassette, Euroraster format, 2-conductor version		
Nominal cooling output ¹⁾	kW	7.06	8.08	9.40
Nominal cooling output, sensitive ¹⁾	kW	4.98	5.58	6.37
Nominal heat capacity ²⁾	kW	9.18	10.50	11.03
Application area (room volume), approx.	m³	190	240	280
Adjustment range, room temperature	°C	+16 to +30		
Operating range - indoor unit	°C	+15 to +35		
Air flow volume per stage	m³/h	620/700/830/ 970/1030	900/960/1040/ 1240/1350	970/1020/1140/ 1260/1500
Sound pressure level ³⁾	dB (A)	31/34/37/40/42	35/39/41/43/45	37/40/42/44/47
Power supply	V/Hz	230 / 1~ / 50		
Enclosure class	IP	X0		
Electrical rated power consumption ¹⁾	kW	0.07	0.15	0.17
Electrical rated current consumption ¹⁾	A	0.38	0.68	0.78
Operating medium		Water; max. 35 % ethylene-glycol, max. propylene-glycol max. 35 %		
Operating limits, medium - cooling	°C	+4 to +18		
Operating limits, medium - heating	°C	+35 to +70		
Max. operating pressure, medium	kPa	1400		
Minimum supply temperature, heating	°C	+40		
Nominal flow rate, medium - cooling ¹⁾	m³/h	1.22	1.39	1.45
Nominal flow rate, medium - heating ¹⁾	m³/h	1.22	1.39	1.45
Rated pressure drop, internal ¹⁾	kPa	30	38	42
Rated pressure drop, internal ²⁾	kPa	30	38	42
Medium connection, inlet	Inches	3/4 internal		
Medium connection, outlet	Inches	3/4 internal		
Medium volume	l	2.84	3.22	
Condensate drainage connection	mm	19		
Condensate pump, flow rate, max.	mm WS	1000		

REMKO KWD

Series		KWD 70	KWD 85	KWD 100
Dimensions				
Height	mm	298		
Width	mm	570		
Depth	mm	1100		
Cover dimensions				
Height	mm	28		
Width	mm	690		
Depth	mm	1220		
Weight	kg	57	59	
Operating weight, approx.	kg	59.8	62.2	
Serial number		1508...	1509...	1510...
EDP		1611868	1611870	1611872

¹⁾ Air inlet temperature TK 27 °C / FK 19 °C, medium inlet 12 °C, medium outlet 7 °C, 0 % glycol concentration, max. air flow volume

²⁾ Air inlet temperature TK 20 °C, medium inlet 50 °C, nominal flow rate as in cooling mode, 0 % glycol concentration, max. air flow volume

³⁾ Distance 1 m free field

2.2 Unit dimensions

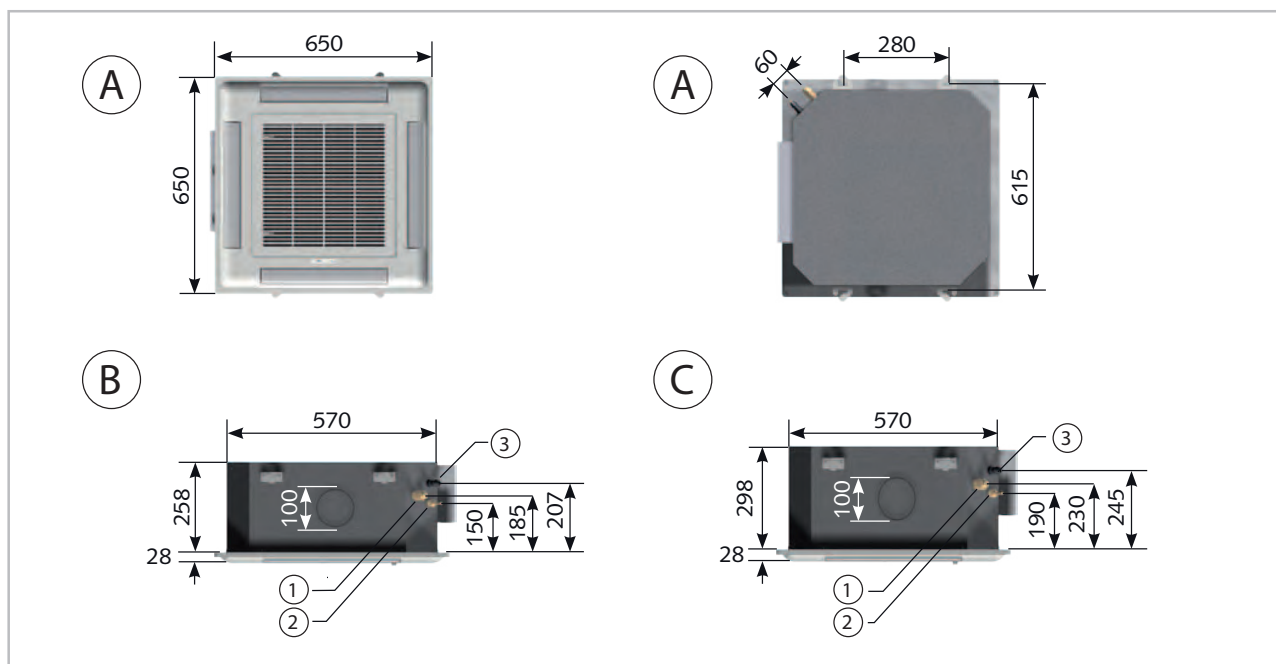


Fig. 1: Dimensions KWD 25 - 55 (all measurements in mm)

A: KWD 25-55
B: KWD 25-45
C: KWD 55

1: Outlet 3/4" IT
2: Inlet 3/4" IT
3: Condensate drainage connection: 19 mm

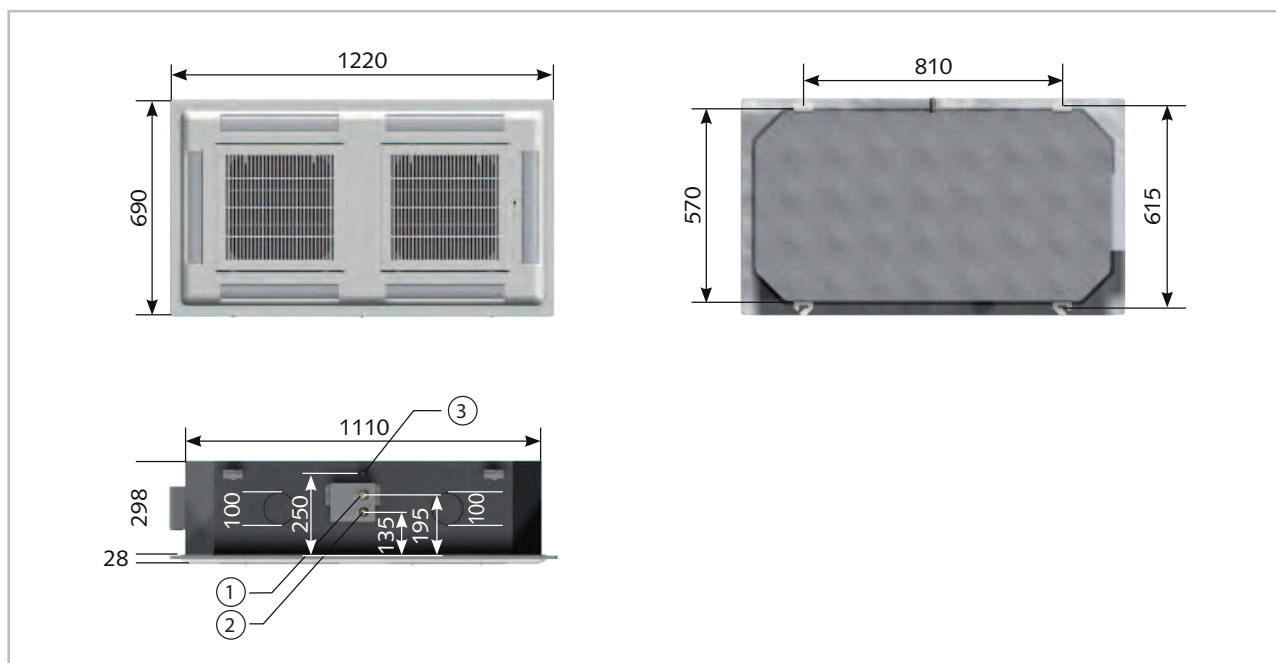


Fig. 2: Dimensions KWD 70 - 100 (all measurements in mm)

1: Outlet 3/4" IT
2: Inlet 3/4" IT
3: Condensate drainage connection: 19 mm

We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

2.3 Cooling and heating capacity

Cooling capacity												
	Medium nominal		Medium inlet									
			5 °C	7 °C		9 °C		11 °C		13 °C		
			Cooling capacity									
	Medium flow rate [m³/h]	Pressure loss [kPa]	Q _K	Q _S	Q _K	Q _S	Q _K	Q _S	Q _K	Q _S	Q _K	Q _S
			[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
KWD 25	0.53	15.0	3.45	2.20	2.71	1.92	2.32	1.70	1.74	1.52	1.38	1.32
KWD 35	0.57	18.0	4.21	2.69	3.34	2.37	2.85	2.08	2.18	1.90	1.67	1.57
KWD 45	0.75	25.0	5.26	3.48	4.32	3.06	3.37	2.71	2.76	2.40	2.31	2.00
KWD 55	0.84	20.0	6.48	4.26	5.40	3.83	4.28	3.24	3.55	2.78	2.87	2.35
KWD 70	1.22	30.0	7.90	5.79	7.06	4.98	4.69	3.87	3.90	3.37	3.10	1.83
KWD 85	1.39	38.0	9.52	6.61	8.08	5.58	6.37	5.30	5.18	4.62	4.24	4.08
KWD 100	1.45	42.0	10.22	7.28	9.40	6.37	7.05	6.04	5.88	4.49	4.76	4.19

Air inlet temperature TK 27 °C / FK 19 °C, 0% Glycol concentration, max. air flow

Q_K = Cooling capacity, total

Q_S = Cooling capacity, sensitive

Heating capacity									
	Medium nominal		Medium inlet						
			35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C
			Heating capacity						
	Medium flow rate [m³/h]	Pressure loss [kPa]	Q _H [kW]	Q _H [kW]	Q _H [kW]	Q _H [kW]	Q _H [kW]	Q _H [kW]	Q _H [kW]
KWD 25	0.53	15.0	1.75	1.97	2.74	3.52	4.39	5.23	6.12
KWD 35	0.57	18.0	2.16	2.42	3.36	4.34	5.29	6.35	7.51
KWD 45	0.75	25.0	2.43	3.13	4.35	5.62	6.80	8.16	9.58
KWD 55	0.84	20.0	2.65	3.85	5.34	6.90	8.23	9.93	11.55
KWD 70	1.22	30.0	4.10	5.15	7.09	9.18	10.84	12.92	15.12
KWD 85	1.39	38.0	4.99	5.85	8.13	10.50	12.41	14.85	17.39
KWD 100	1.45	42.0	5.11	6.11	8.49	11.03	12.97	15.21	17.80

Air inlet temperature TK 20 °C, 0% Glycol concentration, max. air flow

Q_H = Heating capacity, total

3 Design and function

3.1 Unit description

In cooling mode the unit (chilled water outlet) extracts the heat from the interior room to be cooled into the fin register and passes it on to the cold operating medium - water or a mix of water and glycol - within a closed medium cycle. As a result of the heat exchange the medium heats up and the emergent air cools the room down.

In heating mode, a warm operating medium warms the room to be heated. The medium cools down as a result of the heat exchange.

A valve assembly, which routes the operating medium through the register (energy is given up) or past the register (energy is not given up), is used to control the cooling or heating capacity.

The unit is designed for indoor area with suspended ceilings with Euroraster dimensions. The cassette is hidden behind the suspended ceiling, only its cover is visible.

It is operated by an infrared remote control. The unit can be linked to other cassettes via an internal bus and so can be directly controlled from a single point as a group or individually.

The unit consists of a fin register, circulation fan, controller and condensate tray with condensate pump.

Valve assemblies, condensate pumps, cabled remote controls and bus connection lines are available as accessories.

3.2 System layout

The unit is designed for a 2-conductor system. The system has 2 medium pipes (conductors: Supply and return flow) for cooling using a cold medium or heating using a warm medium.

In cooling mode the combined cooling register/heating register in the indoor unit extracts the heat from the room air by absorbing it into the operating medium. A circulation pump transports the heated medium to a chiller which extracts the heat from the medium in an evaporator and then passes it on to the outside air via a cooling cycle in a condenser. The cooled operating medium is then fed in once again to the unit medium circuit. With 2-conductor systems, which are used for cooling or heating, the heating capacity can be generated through a chiller with heat pump function or through a boiler and fed into the circuit. In heating operation, the indoor unit can deliver the heat from the operating medium to the room air.

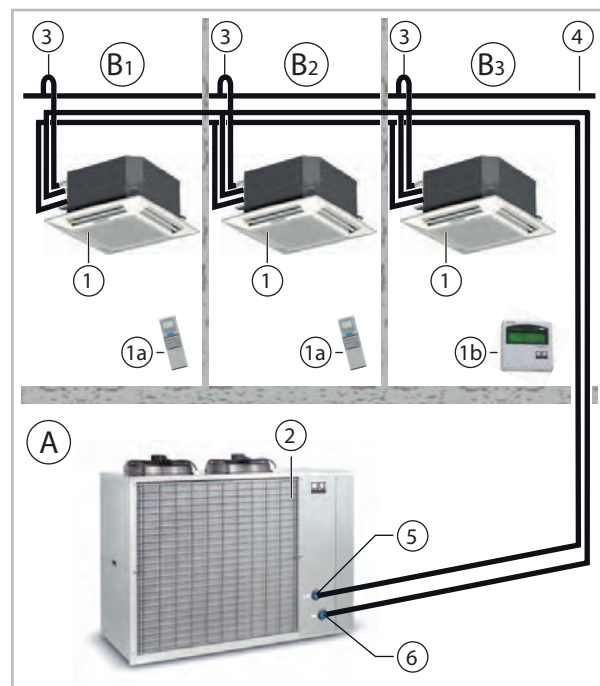


Fig. 3: System layout

- A: Outdoor area
- B1-3: Indoor area 1, 2, 3
- 1: Cold water drain
- 1a: Infrared remote control
- 1b: Cabled remote control
- 2: Chiller
- 3: Condensate drainage line
- 4: Condensate collecting drainage
- 5: Medium outlet
- 6: Medium inlet

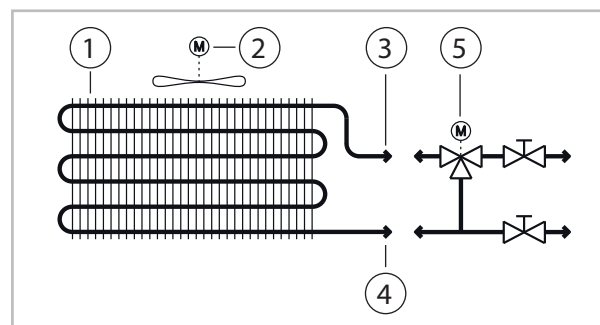


Fig. 4: Medium cycle schematic

- 1: Register
- 2: Recirculating fan
- 3: Medium inlet connection
- 4: Medium outlet connection
- 5: Valve assembly (accessory)

4 Operation

The indoor unit is easily operated using the standard infrared remote control. The indoor unit beeps to acknowledge the correct transmission of data. If it is not possible to program the indoor unit with the remote control, then it can also be manually operated.

Manual mode

The unit can also be started manually. Press the RESET key on the receiver unit of the cover to activate automatic mode. In manual mode, the following settings apply:

Cooling mode: 24°C, fan speed: AUTO

Heating mode: 26 °C, fan speed: AUTO

Press a key on the infrared remote control to interrupt manual mode.

Infrared remote control

The infrared remote control sends the programmed settings a distance of up to 6 m to the receiver of the indoor unit. Data will only be received correctly if the remote control is pointed at the receiver and no objects are obstructing the transmission path.

First insert the supplied batteries (2 each, type AAA) into the remote control. To do so, pull off the flap of the battery compartment and insert the batteries correctly by polarisation (see marks).



Fig. 5: Maximum distance

! NOTICE!

Immediately replace flat batteries with a new set, otherwise there is a risk of leakage. It is recommended that the batteries are removed if the equipment is shut down for longer periods.



Help save on energy consumption in stand-by mode! If the device, system or component is not in use, we recommend disconnecting the power supply. Components with a safety function is excluded from our recommendation!

Display on indoor unit

The illuminated display LEDs indicate the set fan speed:

LED "H" (red) = high fan speed

LED "M" (yellow) = medium fan speed

LED "L" (green) = low fan speed

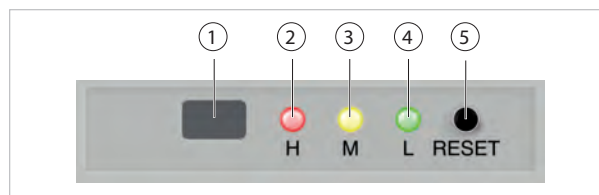


Fig. 6: Display on the unit

- 1: Unit for receiving signals from the remote control
- 2: LED "H"
- 3: LED "M"
- 4: LED "L"
- 5: "RESET" key/Manual operation



If the LEDs, flash, a malfunction has occurred on the indoor unit. (See "Troubleshooting and customer service" chapter)

Keys on the remote control

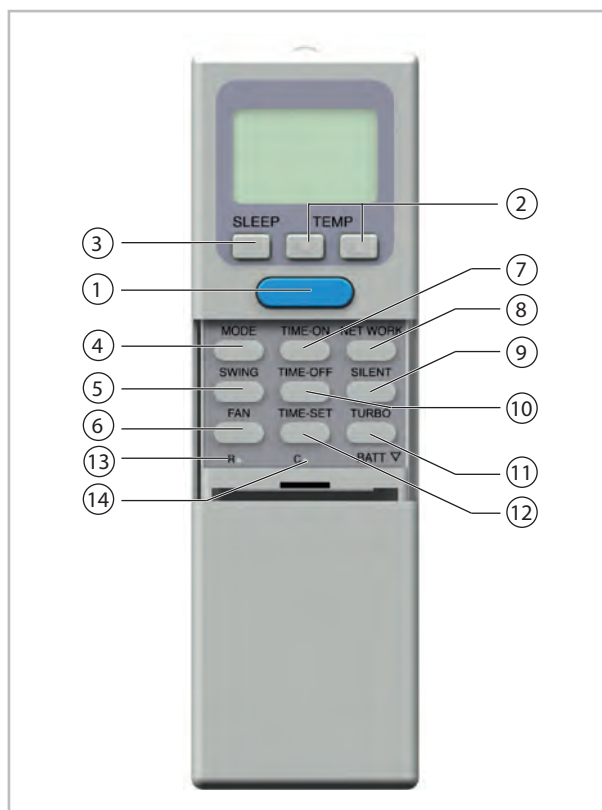


Fig. 7: Keys on the remote control

① "POWER" key

Press this key to operate the unit.

② "TEMP" key

Press this key to set the desired temperature in 1 °C steps within the range 16 °C to 30 °C.

③ "SLEEP" key

Pressing this key will automatically increase or decrease the target temperature by 1 °C within an hour in cooling mode and heating mode respectively.

④ "MODE" key

Press this key to select the operating mode. The indoor unit has 5 modes:

1. Automatic mode (COOL/HEAT):

In automatic mode, the temperature is maintained at the constant setpoint.

2. Cooling mode (COOL):

In cooling mode, the warm room air is cooled to the lower pre-set target temperature.

3. Dehumidification mode (DRY):

In this mode, the room is mainly dehumidified.

4. Recirculation mode (FAN):

In recirculation mode only the air is circulated. The room temperature is not controlled.

5. Heating mode (HEAT):

In heating mode, the cold room air is heated to the pre-set higher temperature.

⑤ "SWING" key

This key switches on the oscillating fins to provide improved air distribution in the room. It can also be used to lock the fins.

⑥ "FAN" key

Press this key to set the desired fan speed. 4 speeds are available: Automatic, high, medium and low fan stage.

⑦ "TIME-ON" key

This key is used to program the automatic switch-on function for the indoor unit.

⑧ "NETWORK" key

Use this key to transfer the data that was set to all other units within a network.

⑨ "SILENT" key

Press this key to set a particularly low fan speed.

⑩ "TIME-OFF" key

This key is used to program the automatic switch-off function for the indoor unit.

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⑪ "TURBO" key

Press this key to set a particularly high fan speed.

⑫ "TIME-SET" key

Press this key to set the time.

⑬ "R" key

Press this key to reset the remote control to its factory settings.

⑭ "C" key

Press this key to activate the time setting.

Key functions

A symbol is shown on the display to indicate that the settings are being transferred.

"POWER" key

Press the "POWER" key to activate/deactivate the indoor unit. The programmed settings and parameters are shown on the display before the unit switches off.

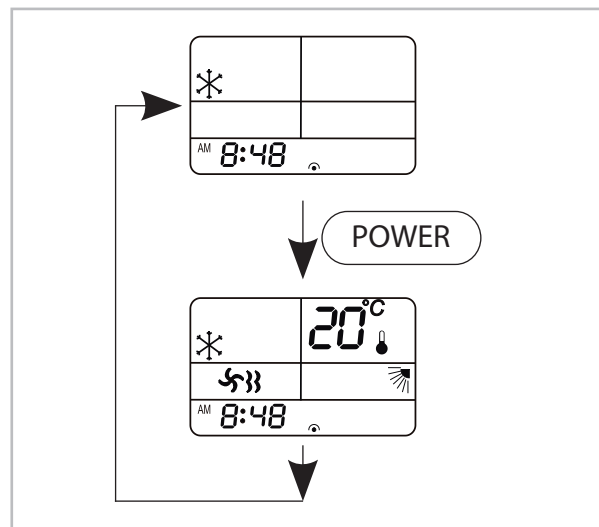


Fig. 8: Remote control On/Off

"TEMP" key

The "TEMP" key is used to set the desired target temperature in 1 °C steps. This setting is not possible in "FAN" recirculation mode.

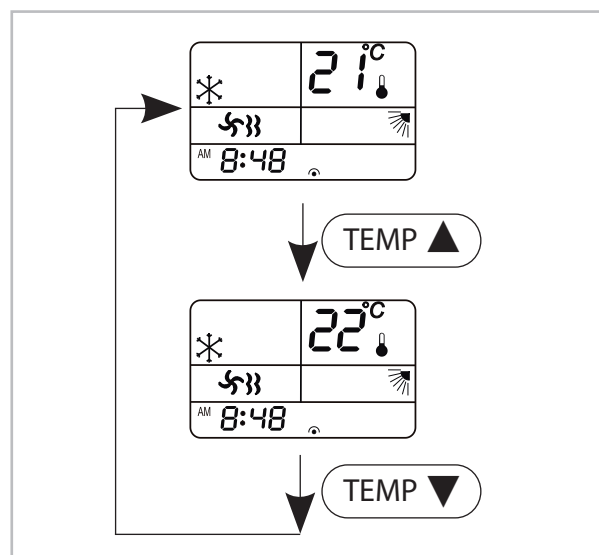


Fig. 9: "TEMP" key

"TIME" key

Use a small pen or similar to press recessed key "C", the time will flash on the display. Press and hold the "TIME-SET" key to, at first slowly, and then quickly adjust the clock time. Once it has been set, press the "C" key again to save the time. The display will stop flashing.

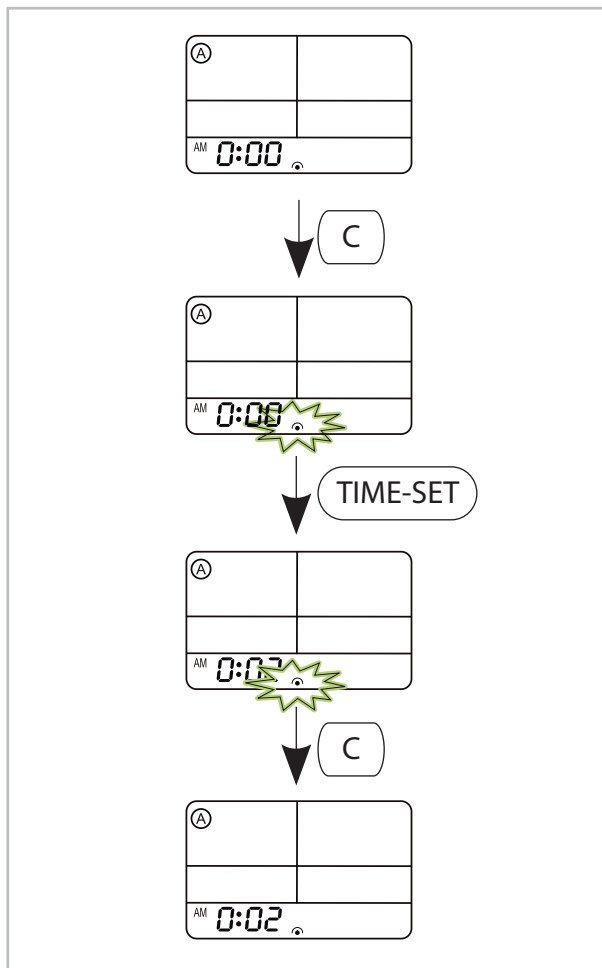


Fig. 10: "TIME" key

"RESET" key

Use a small pen or similar to press the recessed "R" key. All the symbols will appear on the display. After approx. 5 seconds, only the time will flash on the display. After pressing recessed key "C", press and hold the "TIME-SET" key to set the time. Once it has been set, press the "C" key again to save the time. The display will stop flashing.

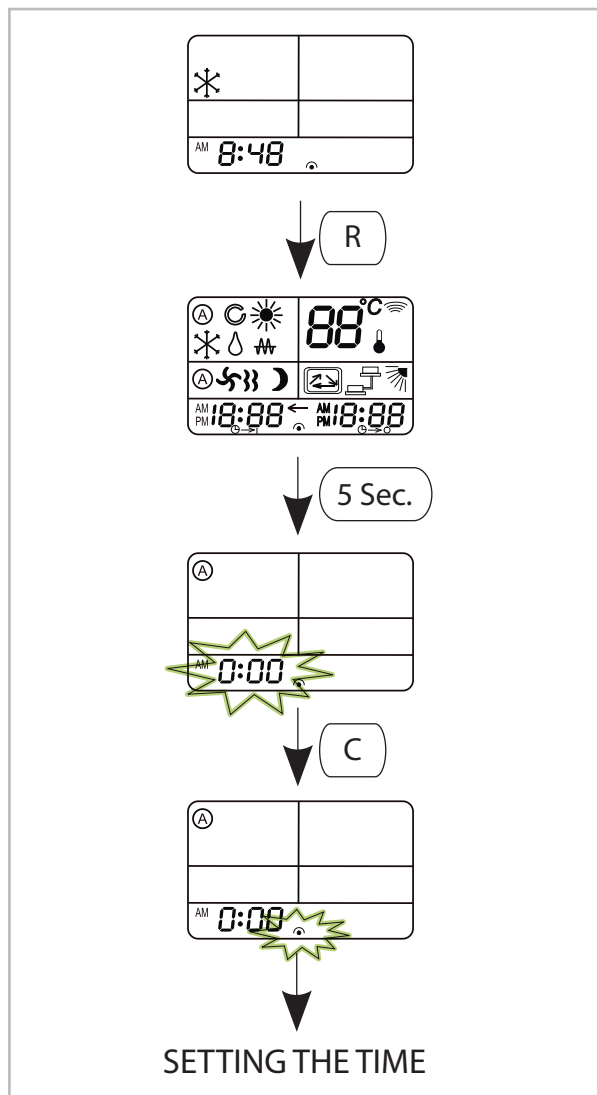


Fig. 11: "RESET" key

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"MODE" key

Press the "MODE" key to change to another mode. A total of 5 modes are available:

1. COOL/HEAT - Automatic mode, automatic selection of cooling or heating mode
2. COOL - Cooling mode, mainly used in summer
3. DRY - Dehumidification mode, summer or winter mode
4. FAN - Recirculation mode, no cooling or heating
5. HEAT - Heating mode, preselect. Winter mode

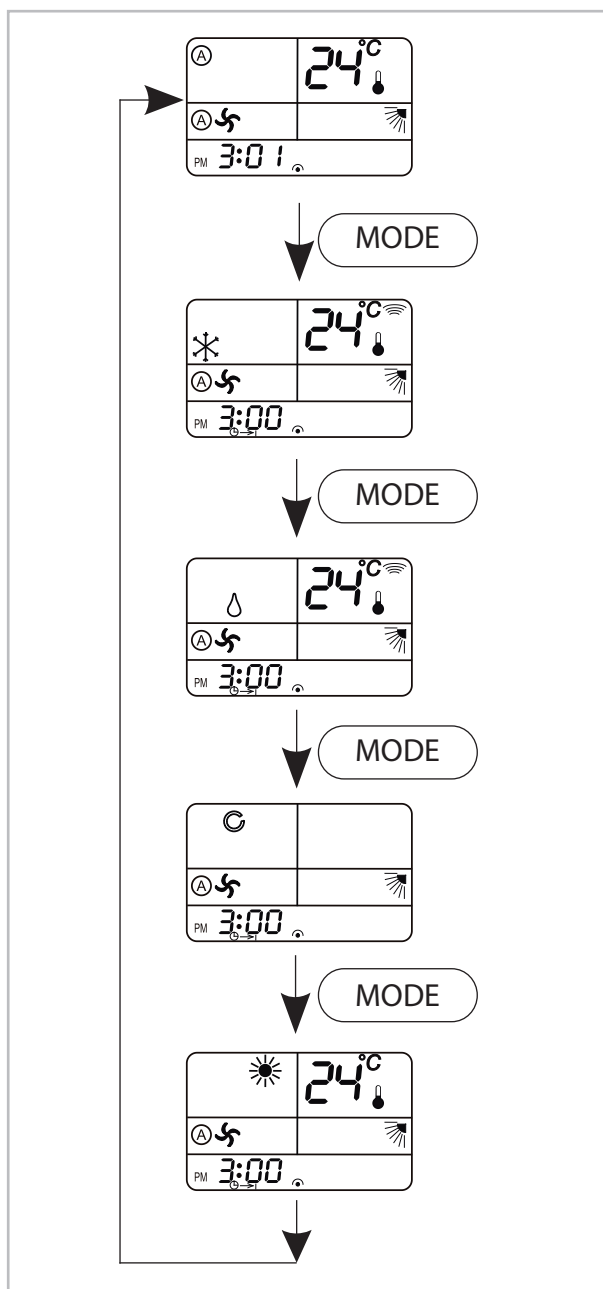


Fig. 12: Mode key

"AUTO" mode

Press the "MODE" key once or repeatedly to switch to automatic mode. In this mode, the controller automatically selects "COOL" or "HEAT" mode depending on the temperature. The temperature is then maintained at the set value. The prerequisite is that sufficient cooling or heating medium at an appropriate temperature is available. The "FAN" should be set to "AUTO".

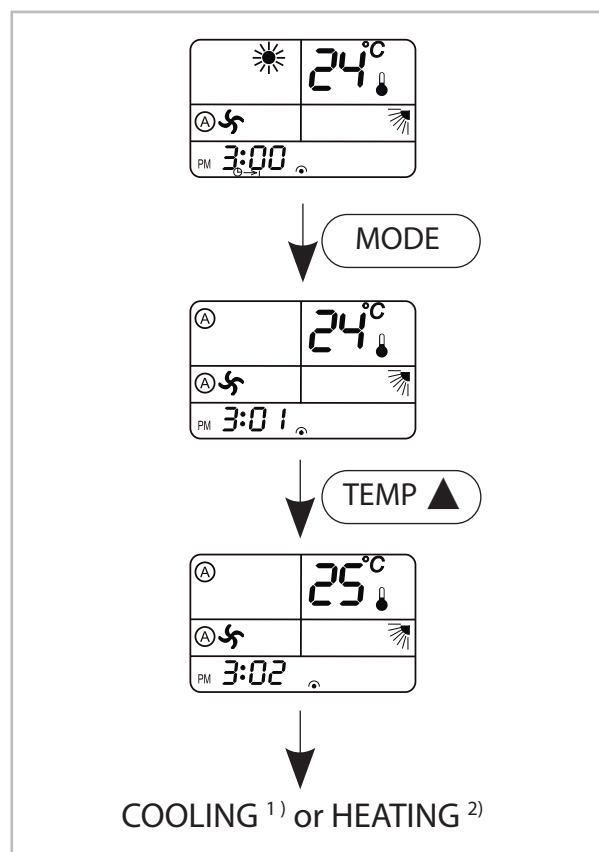


Fig. 13: "AUTO" mode

- 1): The target temperature is below the room temperature
- 2): The target temperature is above the room temperature

"COOL" mode

Press the "MODE" key once or repeatedly to switch to cooling mode. Use this mode to cool the room air to the desired target temperature. Press the "TEMP \ominus / \oplus " keys to set the desired room temperature in 1 °C steps. If the room temperature is 1 °C above the desired temperature and sufficient coolant is available, the indoor unit will start to cool the room air. If the temperature falls to approx. 0.5 °C below the set room temperature, the controller will switch off cooling mode.

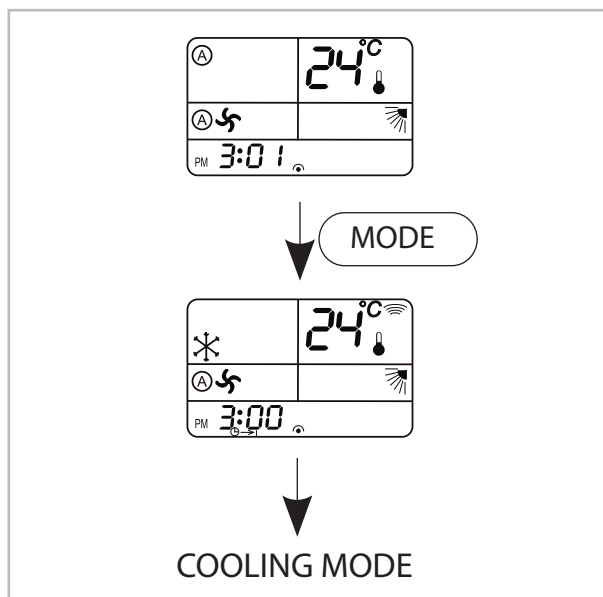


Fig. 14: "COOL" mode

"DRY" mode

Press the "MODE" key once or repeatedly to switch to dehumidification mode. Use this mode to dehumidify the room in an unregulated fashion. After pressing the "DRY" key, select the desired temperature and fin position. It is not possible to set the fan speed. The fan is switched off at certain intervals to lower the temperature at the cooling battery. The low temperature causes the air temperature at the fins to fall below the dew point. Excess humidity in the air condenses on the cooling battery and the room is dehumidified.

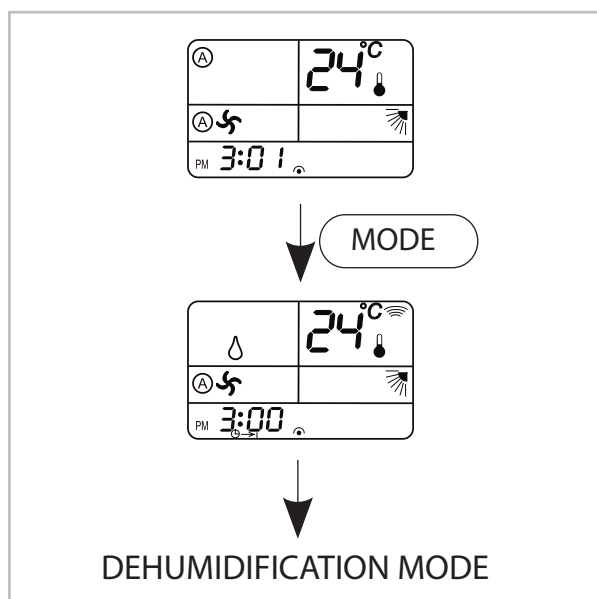


Fig. 15: "DRY" mode

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"FAN" mode

Press the "MODE" key once or repeatedly to switch to recirculation mode. In this mode, the unit is used as an air circulation unit. The room is neither heated nor cooled.



This mode allows the heat trapped under the ceiling to be circulated to the lower regions of the room in winter.

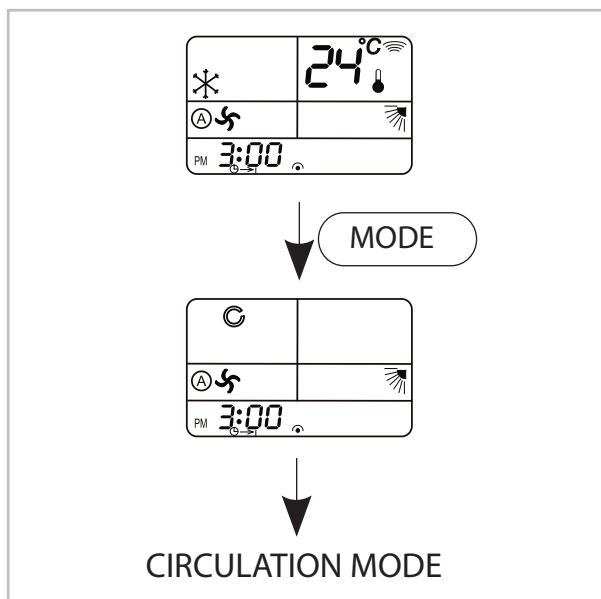


Fig. 16: "FAN" mode

"HEAT" mode

Press the "MODE" key once or repeatedly to switch to heating mode. Use this mode to heat the room air to the desired target temperature. The prerequisite for this is that sufficient heat is present in the cold water system.

Press the "TEMP" \ominus / \oplus key to set the desired room temperature in 1 °C steps. If the room temperature is below the set target temperature, the three-way valve provided by the customer opens. If there is sufficient heating medium available, the indoor unit starts to warm up the air in the room. If the actual temperature rises approx. 1 °C above the set room temperature, the controller switches the valve off.



Cooling mode:

We recommend setting the target temperature to max. 6 °C below the outside temperature. The automatic fan speed and swing functions should also be used.



Heating mode:

The fan will only start when the fin temperature reaches 38°C.



Heating mode:

We recommend setting the target temperature to max. 28°C. Maximum fan speed and the lowest fin setting should also be used.

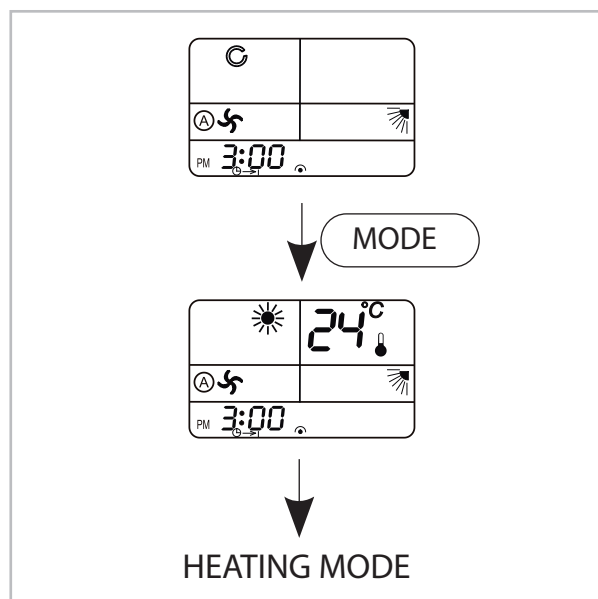


Fig. 17: "HEAT" mode

"SILENT" key

Pressing the "SILENT" key sets the fan to a particularly low speed and the fan symbol starts to flash. This level is used to reduce the noise emissions again for example. After pressing the "FAN" key, SILENT mode is exited.

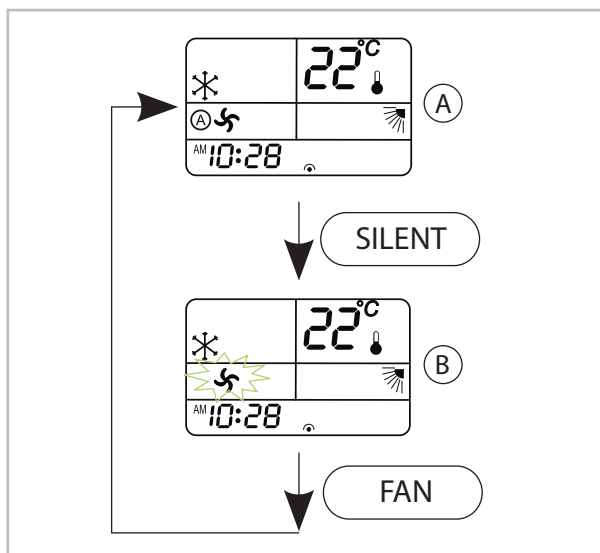


Fig. 18: "Silent" key

A: Automatic
B: Silent level

"TURBO" key

Pressing the "TURBO" key sets the fan to a particularly high speed and the fan symbol for level H starts to flash. This stage is used to cool or heat the room faster for example. After pressing the "FAN" key, TURBO mode is exited.

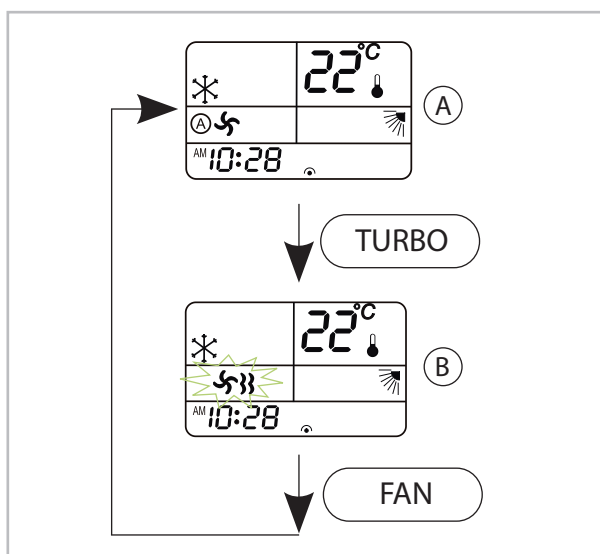


Fig. 19: "Turbo" key

A: Automatic
B: Turbo level

"SWING" key

The "SWING" key is used to provide continual and automatic vertical adjustment of the fins. When switched on, the cooled air inside the room is distributed better. If the "SWING" key is pressed during the swing motion, the fins stop in their current position. Pressing the key again resumes the swing motion.

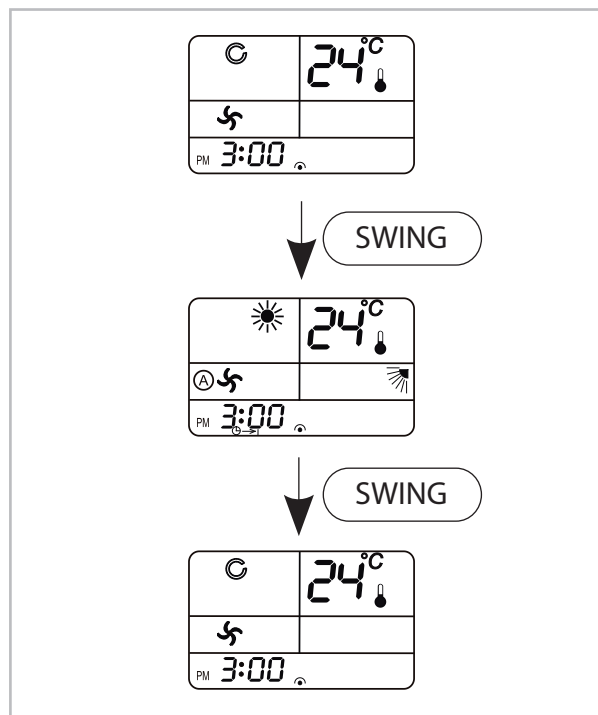


Fig. 20: "SWING" key

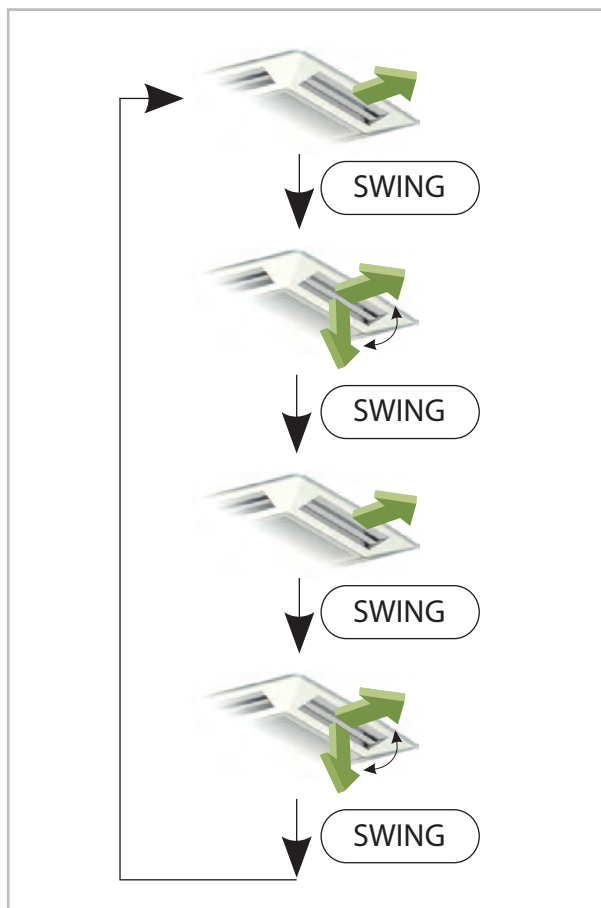


Fig. 21: Swing function

"TIME" keys

The "TIME-ON/OFF" keys are used to program the switch-on/off time, the "TIME-SET" key to set the time.

Press the "TIME-ON" or "TIME-OFF" key to activate the timer. The clock display then disappears. The timer symbol for the switch-on/off time will flash. Press the "TIME-SET" key to set the desired switch-on/off time in 10 minute steps. After programming has been completed, the settings are transmitted to the indoor unit. For delayed switch-on press the "TIME-ON" key, for delayed switch-off press the "TIME-OFF" key. The timer symbol will stop flashing and the indoor unit beeps to acknowledge the programmed parameters. The unit automatically switches on or off once the programmed time is reached. If the indoor unit is switched on automatically, the previously set mode, temperature and fan speed are activated. The switch-on/off time can be prematurely cancelled by pressing the appropriate "TIME" key or "POWER" key.

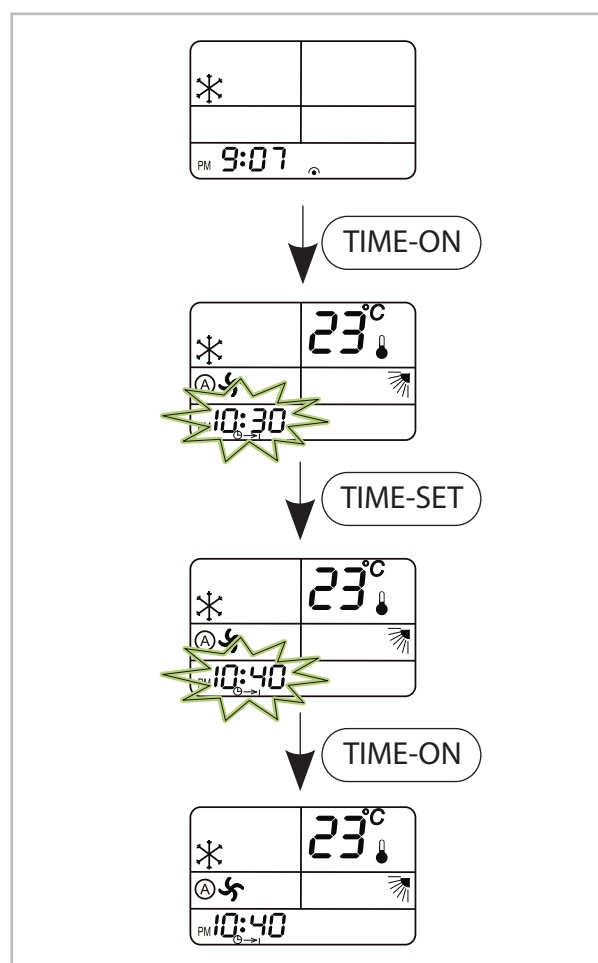


Fig. 22: "TIME" key - Switch-on time

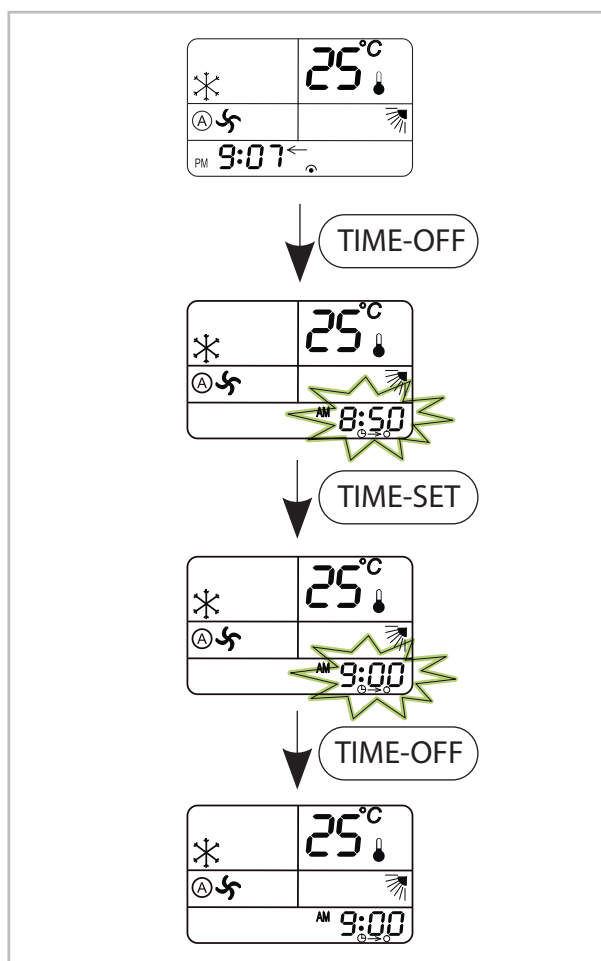


Fig. 23: "TIME" key - Switch-off time

"SLEEP" key

After the "SLEEP" key is pressed, the symbol is shown on the display and the room temperature is raised or lowered by 0.5 °C in cooling and heating mode respectively 30 minutes after the function starts up. After a further 30 minutes, the room temperature is raised or lowered by 1 °C in cooling and heating mode respectively. After a further hour, the room temperature is held at a constant 2 °C above or below the original target temperature in cooling and heating modes respectively. This temperature is then maintained at a constant level. This function is disabled by pressing the "POWER" or "SLEEP" key. The symbol on the display extinguishes.

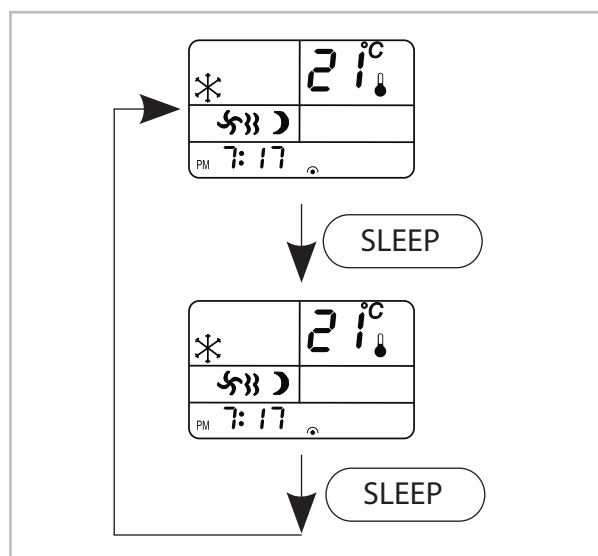


Fig. 24: "SLEEP" key - Cooling mode

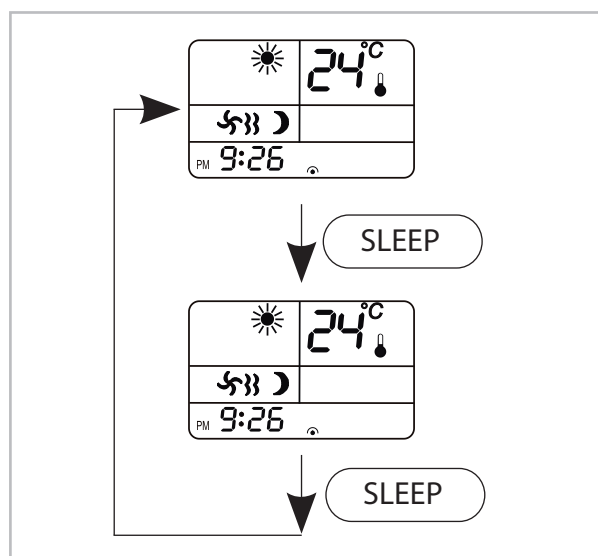


Fig. 25: "SLEEP" key - Heating mode

"NETWORK" key

The "NETWORK" key enables the settings on the master unit (leading unit) to be transferred to all slave units (following units) on the network. All units confirm that they have received the settings correctly by beeping. The infrared remote controls do not copy the changed settings. Press and hold the key for 3 seconds to transfer. However, each individual unit can still be operated individually.

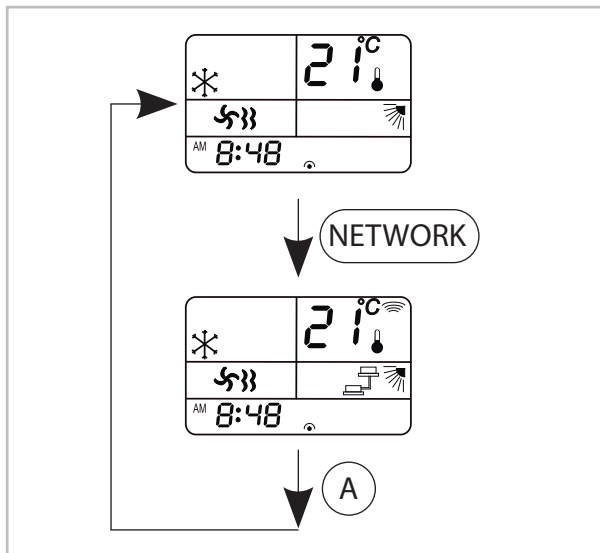


Fig. 26: "NETWORK" key

A: Transfer to all units. Confirmation by means of a signal tone

Master/slave behaviour

If multiple units are installed, for example within a room, a higher-level unit (leading unit = master) can transfer the remote control's settings to all lower-level units (following unit = slave). To transfer the data, the leading unit (master) is connected to the following units (slave). The master unit can be operated via a standard infrared remote control or via a fixed cabled remote control (accessory). The data that is sent is then transferred to all other slave units via the internal bus line. The number of slave units is limited to 31.

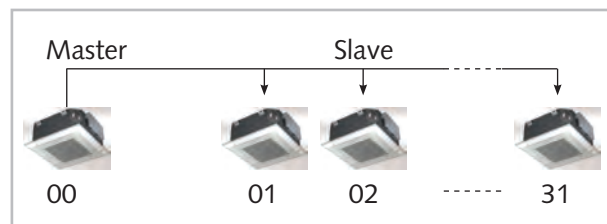


Fig. 27: "NETWORK" key - Master/slave behaviour

Two different network variants are available:

1. Operating a group:

A cabled or IR remote control for the master unit can control the master and all slave units.

A cabled or IR remote control for the slave unit can only control the slave unit.

To do so, the master unit must be addressed with jumper JP 0 being plugged in on the board.

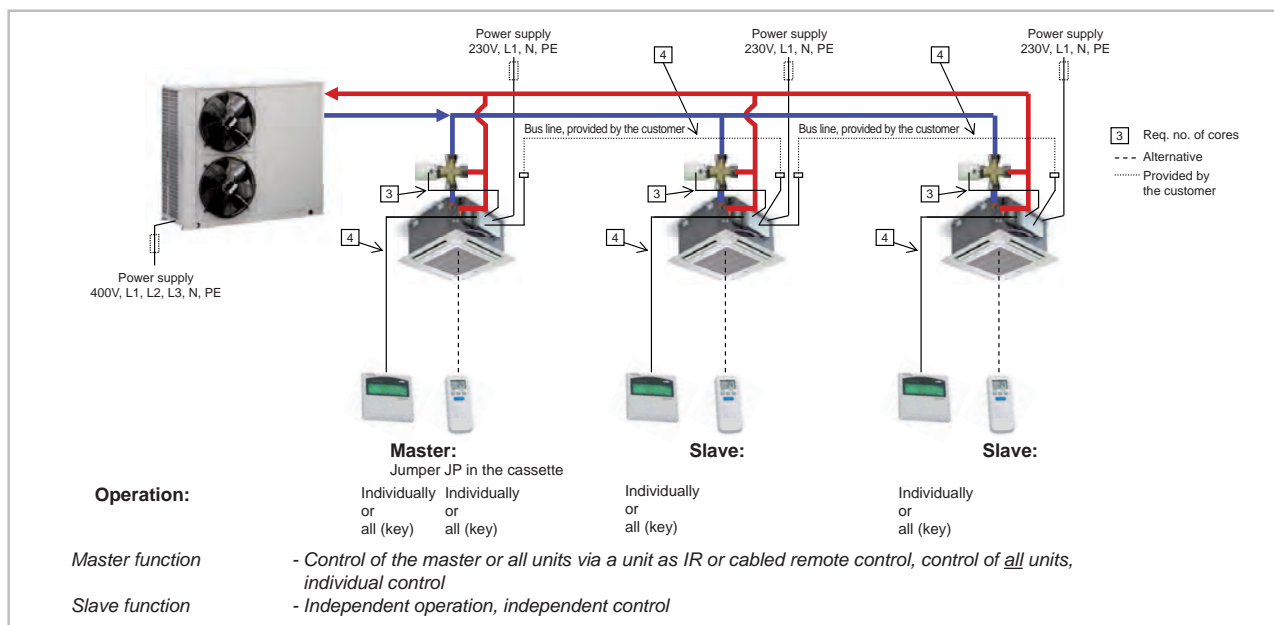


Fig. 28: Operating a group

2. Operating a group or specific units within a group:

A cabled remote control for the master unit can control the master and all or individual slave units.

A cabled remote control for the slave unit can only control the slave unit.

To do so, the master unit and all slave units must be addressed with the DIP switch settings of the cable remote control.

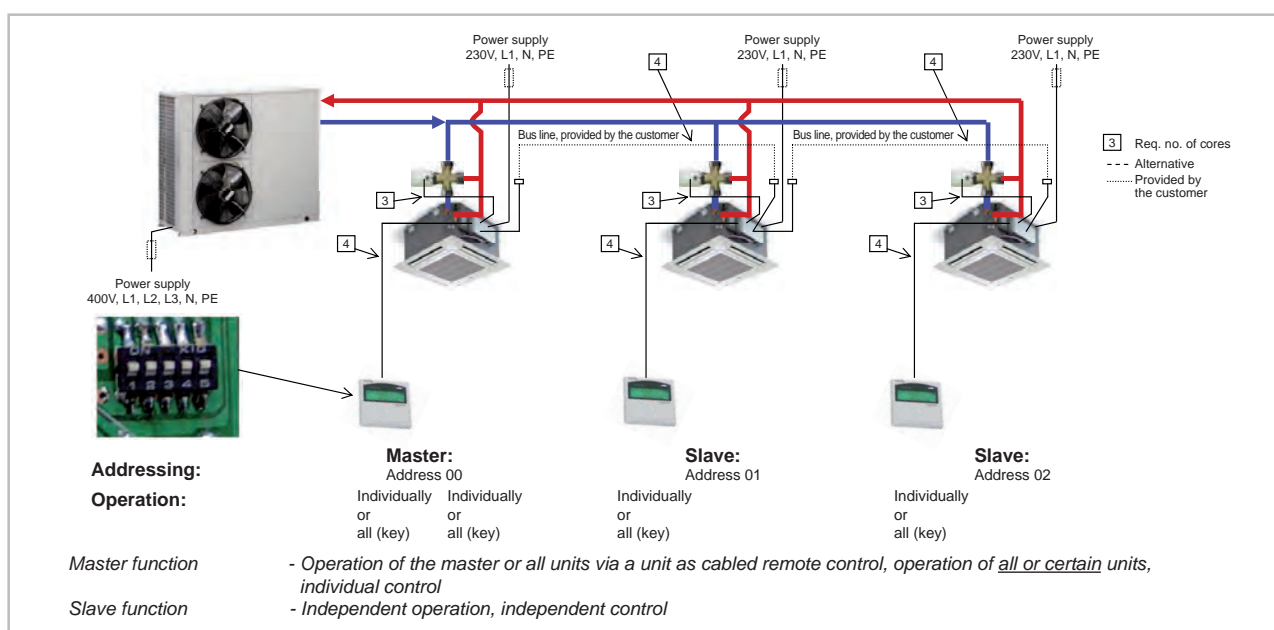


Fig. 29: Operating a group or specific units within a group

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Please enter the configuration of the installed networks in the table. Identify the master or slave units in the corresponding rows.

Address	Room designation	Infrared remote control Master	Infrared remote control Slave	Cabled remote control Master	Cabled remote control Slave
00					
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

5 Installation Instructions for qualified personnel

Important notes prior to installation

Observe the operating manuals for the indoor unit and the outdoor unit when installing the entire system.

- Observe the operating manuals for the indoor unit and the chiller or heating system when installing the entire system.
- The indoor units and chillers work independently. A connecting line between the two is not necessary.
- Transport the unit in its original packaging as close as possible to the installation location. You avoid transport damage by doing so.
- Check the contents of the packaging for completeness and check the unit for visible transport damage. Report any damage immediately to your contractual partner and the shipping company.
- Select an installation location which allows air to freely flow through the air inlet and outlet (see section "Minimum clearances").
- Do not install the unit in the immediate vicinity of devices which generate intensive thermal radiation. Installation in the vicinity of thermal radiation reduces the unit output.
- Lift the unit at the corners and not by the medium or condensate drainage connections.
- The medium connection lines, valves and connections must have vapour density insulation. If necessary, also insulate the condensate drainage line. In dual systems with cooling and heating modes, the requirements of the current Energy Savings Ordinance (EnEV) are to be complied with.
- Seal off open refrigerant piping with suitable caps or adhesive strips to prevent the infiltration of moisture and never kink or compress the refrigerant piping.
- Avoid unnecessary bends. This minimises the pressure loss in the lines.
- Install all electrical wiring in accordance with applicable DIN and VDE standards.
- Ensure the electrical cables are properly connected to the terminals. Otherwise there is a risk of fire.
- Service openings should be provided in the suspended ceiling to allow maintenance access to the control box or the valve assembly.
- Any ventilation ducts or pipes and connection fittings, which are used to connect a second room or supply fresh air, should be insulated with diffusion-tight material.
- Only install the valve assembly or other attachments once the indoor unit has been installed.

Installation materials

The unit is attached using 4 threaded rods provided by the customer.

In order to be able to complete installation, wall plugs, trapezoidal sheet metal supports, steel profiles, fixing clamps for medium and condensate drainage lines (as well as laying ducts), and connection fittings for condensate drainage lines are required.

Selecting the installation location

The indoor unit is specifically designed for horizontal mounting in suspended ceilings with Euro-raster dimensions. However, it can also be installed in suspended ceilings with different dimensions.

Take into account the installation height of the equipment.

Minimum clearances

Observe the minimum clearances to allow access for maintenance and repair work in the suspended ceiling and to facilitate optimum air distribution for the cover.

! NOTICE!

If the unit is operated in heating mode, the maximum installation height of 2.7 m must not be exceeded and a cabled remote control must be used if necessary.

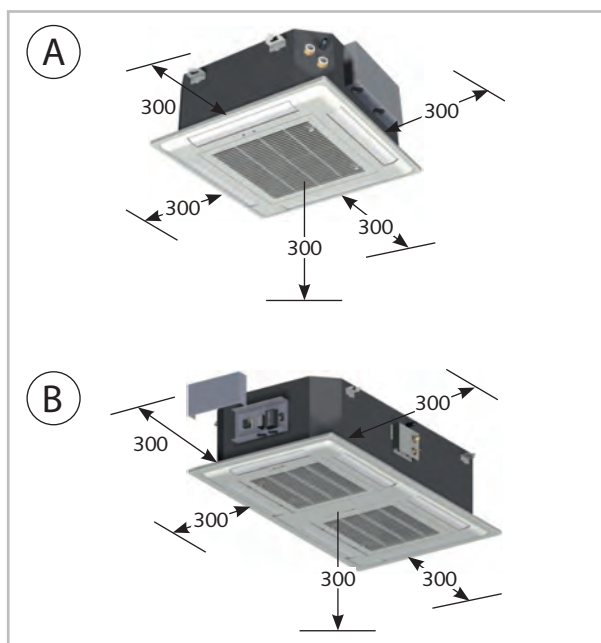


Fig. 30: Minimum clearances (all measurements in mm)

A: KWD 25-55
B: KWD 70-100

6 Installation

6.1 Unit installation

! NOTICE!

Installation should only be performed by authorised specialists.

Unit installation

The unit is mounted with the cover face down on four threaded rods. Take into account the ceiling grid and any other installations.

1. Use the dimensions of the ceiling cassette to mark the fixing points for the threaded rods on structural parts approved to support the static load above the suspended ceiling.
2. Fit any connection nozzles before installing the unit if connections to a second room or a fresh air connection are required. See the "Connections to adjoining room and fresh air intake" section.
3. Fit the indoor unit onto the threaded rods and use the lower nuts to level it (Fig. 31).
4. Make sure that clearance A, as specified in the table (on page 29) is provided between the underside of the suspended unit and the underside of the fastening surface (Fig. 32).
5. Connect the refrigerant piping, electrical cables and condensate drainage line to the indoor unit as described below.
6. Check again that the unit is level.
7. The final task is to tighten the counter nuts and attach the cover.



Fig. 31: Hooking in the unit

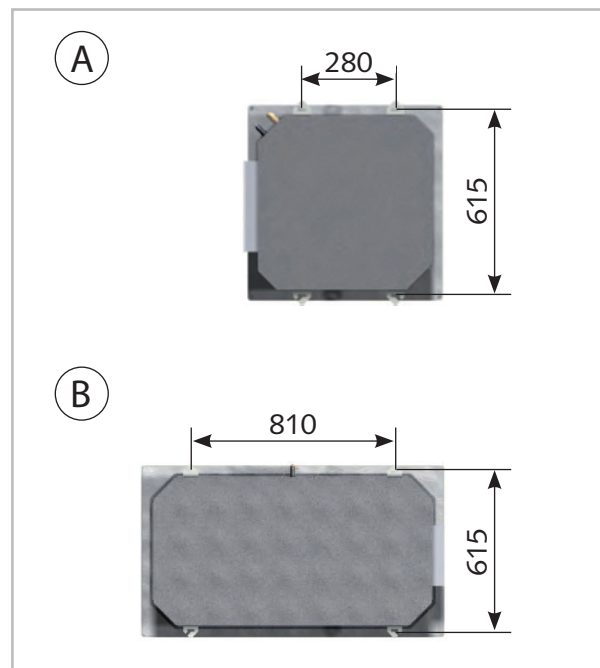


Fig. 33: Unit mount

A: KWD 25-55
B: KWD 70-100

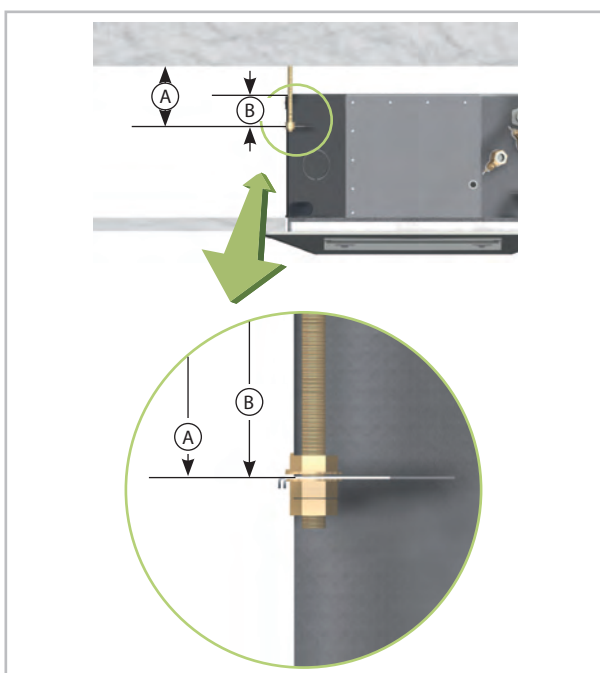


Fig. 32: Fastening the unit

A: Dimension A
B: Dimension B

Dimensions in mm	KWD 25-55	KWD 70-100
Distance A	35	35
Distance B	25	25
Unit mount	615 x 280	615 x 810

6.2 Connection for medium piping

- The piping connection provided by the customer is carried out on an angled side of the unit on the KWD 25-55 and in the middle of the longer side on the KWD 70-100.
- For the purpose of servicing, connections must be equipped with shut-off valves and the medium flow rate adjusted using hydronic balancing valves.
- Additional automatic bleed valves are to be provided in the supply and return flow at the installation's highest point.
- The medium piping may not exert any structural load on the unit.
- The line connections may not generate any thermal or mechanical stresses on the unit. If necessary cool the piping or support with the second tool.

6.3 Necessary system components

Valve assembly (accessory)

In 2-conductor systems, cold or warm medium is fed through the register in the unit and cold or warm air can then be released. Control is provided by the 3-way valve assembly. It comprises the electrically actuated valve head and the valve body. If the head is electrically activated, it actuates the body, which routes the medium into the register. If the temperature is reached, the head is switched off and the medium is fed past the heat exchanger through the bypass. The bypass serves to ensure the minimum medium flow rate for the chiller.



The time between being fully open and fully closed can be approx. three minutes.

Valves for hydronic balancing

The calculated individual pressure losses in the pipeline network layout for each individual unit are adjusted to the entire system with hydronic balancing valves to be provided by the customer. The nominal flow rates for the medium adjust to the values needed as a consequence of the pressure loss.

Anti-freeze protection (accessories)

A water glycol mix is generally used as medium for a cold water system. Depending on the use to which the glycol type and quantity is put, the viscosity changes, the loss in pressure increases and the unit's cooling or heating capacity reduces. All system components must be approved for use with glycol.

! NOTICE!

When disposing, the product requirements of the glycol type used must be observed.

Diaphragm expansion vessel (MAG)

To avoid pressure fluctuations during standstill because of temperature changes, diaphragm expansion vessels filled with nitrogen (moisture neutral) must be integrated in the system.



No moisture can condense in the nitrogen filler.

Safety valve

Safety valves limit excess operating pressure due to excess warming or overfilling of the operating medium. The valve outlet requires unobstructed draining into a drain line. Applicable local disposal ordinances must be observed if glycol is used.

Automatic bleed valves

The unit has one or two manual bleed valves on the collector pipe of the register. The unit can be bled separately after the system has been filled. Automatic bleeding valves must also be installed at the highest point in the collector line.

! NOTICE!

Glycol tolerant air bleeding valves are necessary when using media that contain glycol.

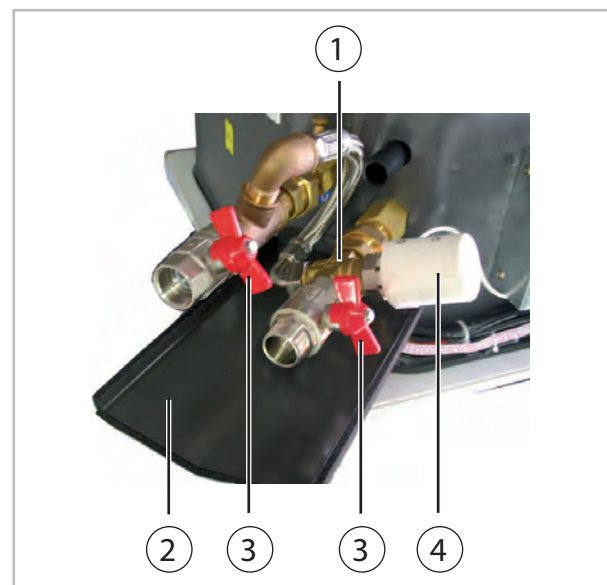


Fig. 34: Manual bleeding

- 1: Valve body
- 2: Additional condensate tray
- 3: Shut-off valve
- 4: Valve head

Condensate tray (standard equipment)

The delivery includes an additional condensate tray for installation on the side of the unit in the suspended ceiling. This is required to catch the condensate that arises on a valve assembly or on the valves provided by the customer. Subsequently check the incline and that it is functioning correctly.

6.4 Connections to adjoining room and fresh air intake

The unit has been designed to enable cooling a second room and taking in fresh air independently of this.

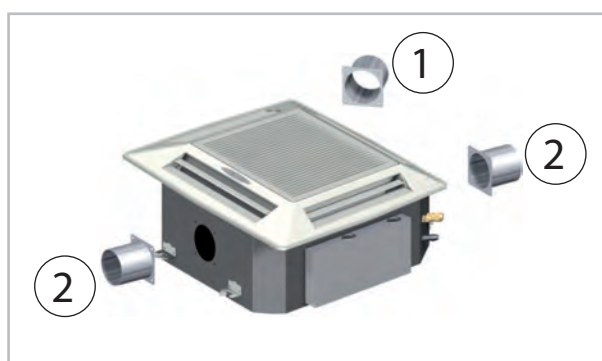


Fig. 35: Connections to adjoining room and fresh air intake KWD 25-55

- 1: Fresh air connection
- 2: Adjoining room connection

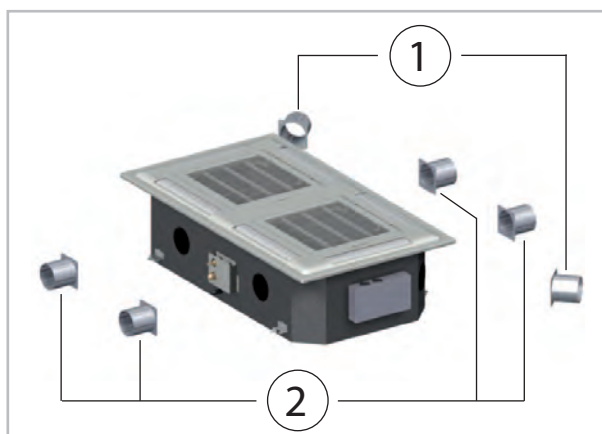


Fig. 36: Connections to adjoining room and fresh air intake KWD 70-100

- 1: Fresh air connection
- 2: Adjoining room connection

! NOTICE!

Only one adjacent room connection and one fresh air connection may be used!

Installation instructions

Proceed as follows to make the connections to an adjoining room and the fresh air intake:

1. Note that the exchanger fins are located directly behind the opening being removed. These should not be damaged under any circumstances (Fig. 37).
2. Carefully remove the insulation behind the opening (Fig. 38).
3. Now break through the appropriate opening (Fig. 39).
4. Keep the ventilation pipes as short as possible and lay them in such a way as to minimise the number of bends.
5. The collars, screws, flexible/folded spiral seam pipes and insulation materials must be provided by the customer. The above items can be obtained from specialist suppliers (Fig. 40).



Fig. 37: Remove the cut-out

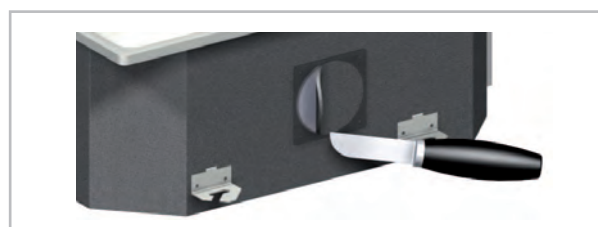


Fig. 38: Remove the insulation

REMKO KWD



Fig. 39: Break through the opening

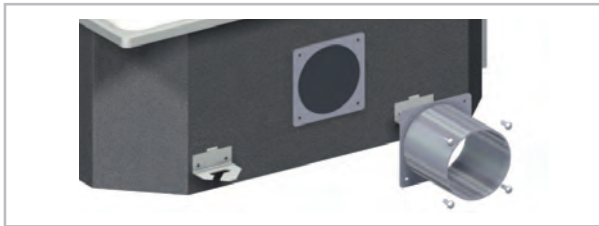


Fig. 40: Install the nozzles

Adjoining room connection

The unit can also be used to cool an adjoining room through a duct system, e.g. hidden behind a suspended ceiling. The following prerequisites must be met for this:

- Observe the regional regulations concerning air treatment.
- Fit a collar with a nominal diameter of 100 mm to the adjoining room connection.
- The cooling capacity of the indoor unit must be sufficient for both rooms.
- An opening must be made between both rooms to allow the air to circulate.
- The maximum pipe length of 7 m should not be exceeded (Fig. 41).
- In order to ensure that the air is transported to the adjoining room, close off 1 or 2 of the 4 outlets on the cover. Stick a black single-sided adhesive fabric strip over the outlet openings being covered. This strip must be able to withstand the effects of a continual air flow.

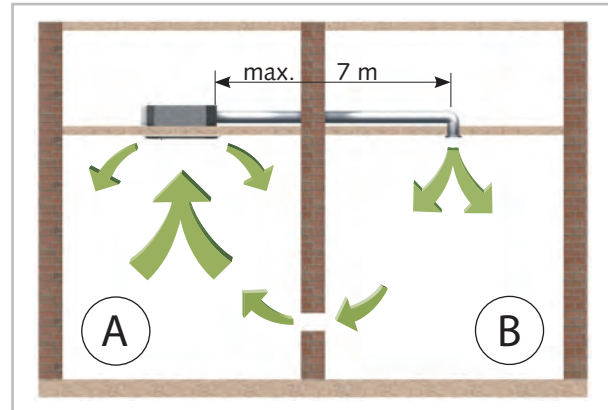


Fig. 41: Adjoining room connection

A: Main room
B: Adjacent room

Fresh air connection

The unit can also be employed to suck in and regulate the temperature of fresh air (outdoor air), in addition to room air. This is the preferred option for rooms with a high rate of air consumption.

- Observe the regional regulations concerning air treatment.
- Fit a collar with a nominal diameter of 100 mm to the fresh air connection (Fig. 42).

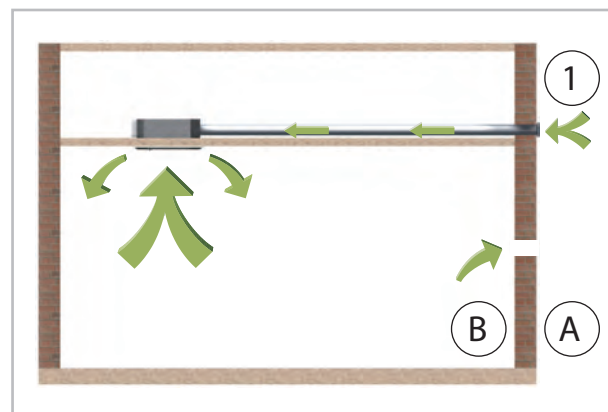


Fig. 42: Fresh air connection

1: Outdoor air intake
A: Outside
B: Inside

- The fresh air content should not exceed 10% of the nominal air flow rate for the unit. The fresh air supply should be controlled by an additional speed-regulated fan.
- The air at the outdoor air intake should be sucked in through a dust filter at a maximum rate of 2.5 m/s to prevent the ingress of rain water.
- The fan should be connected to a separately protected electrical supply that is to be provided by the customer.

7 Condensate drainage connection

If the temperature falls below the dew point, condensate will form on the cooling fins during cooling mode. A collection tray together with a condensate pump and liquid level switch are fitted as standard below the cooling fins. If the liquid level switch trips a protective shutdown due to inadequate removal of the condensate, the pump will switch on immediately and run on for approx. three minutes.

- The condensate drainage line should have an incline of min. 2%. This is the responsibility of the customer. If necessary, fit vapour-diffusion-proof insulation.
- If the level of the condensate drainage line on the unit is above that of the outlet, route the pipe vertically upwards and then with an incline to the drain.
- Route the unit's condensate drainage line freely into the drain line. If the condensate runs directly into a sewer pipe, fit a trap to prevent any unpleasant odours.
- When operating the unit at outside temperatures below 0 °C, ensure the condensate drainage line is laid to protect it against frost. If necessary, fit a pipe heater.
- Following installation, check that the condensate run off is unobstructed and ensure that the line is durably leak tight.

! NOTICE!

The max. pump pressure of the condensate pump is 1000 mmWS. Capacity reductions can result from external influences such as air-side counter-pressure, soiling or wear. In order to guarantee safe functional operation, we recommend observing a maximum delivery height of 800 mm!

! NOTICE!

If condensate is removed via a duct in accordance with DIN EN 1717, ensure that any microbiological contamination present on the wastewater side (bacteria, fungi, viruses) cannot enter the unit connected to it.

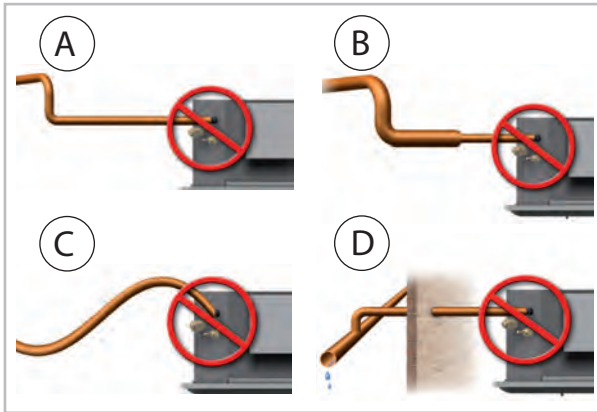


Fig. 43: Condensate drainage connection - incorrect!

- A: Riser pipe too far away
- B: Condensate drainage line too large/small
- C: No incline
- D: Cannot freely drain away

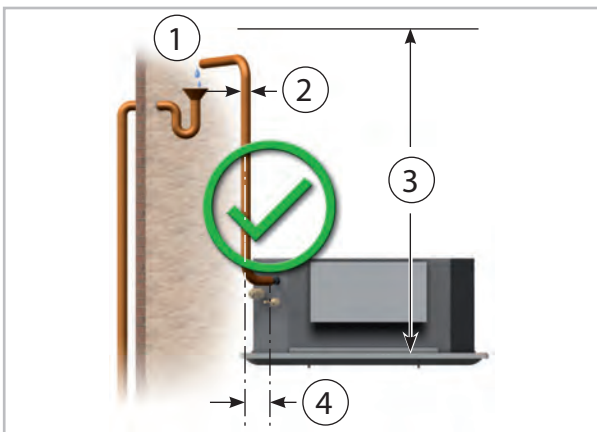


Fig. 44: Condensate drainage connection - correct!

- 1: Min. 2% incline, free inlet
- 2: 16-20 mm
- 3: Max. flow rate 1000 mmWS,
Recommendation: max. 800 mm height difference
- 4: Max. 100 mm

8 Electrical wiring

8.1 General connection and safety instructions



DANGER!

All electrical installation work is to be performed by specialist companies. Disconnect the power supply when connecting the electrical terminals.

- We recommend that a main/repair switch be installed close to the unit. This must be provided by the customer.
- The power supply is made at the indoor unit, a control line to the chiller is not necessary.
- If a condensate pump, which is available as an accessory, is used in conjunction with the unit, the pump switch-off contact switches off the power supply or the valve if necessary.
- The terminal block is located inside the unit. It can be accessed after opening the cover.

Proceed as follows to connect:

1. ➤ Open the control box cover by removing the fixing screws and lifting off the cover.
2. ➤ Feed the de-energised cable through the edge protection rings on the control box and clamp the cable in the strain relief
3. ➤ Then connect the cable in accordance with the connection diagram.

4. ➤ Connect the electrical plugs on the cover to the mating connectors on the cassette. It is not possible to incorrectly connect these.

5. ➤ Mount all removed parts.



NOTICE!

Check all plug and terminal connections to verify that they are tight and make a permanent contact. Tighten as required.



Fig. 45: Connection terminals KWD 25-55

8.2 Electrical drawings

KWD 25-55

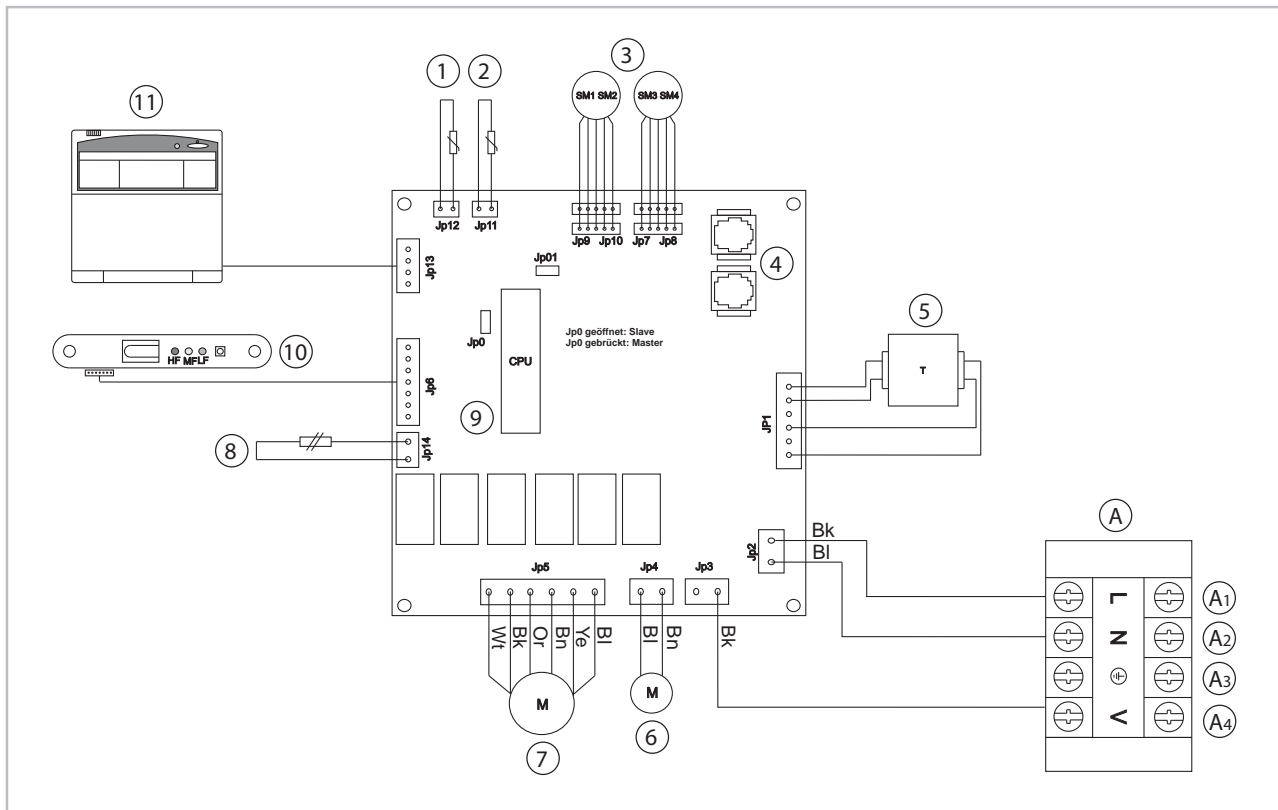


Fig. 46: Electrical drawings KWD 25-55

- | | |
|-----------------------|--|
| A: Terminal block | 5: Transformer |
| A1: Phase conductor | 6: Condensate pump |
| A2: Neutral conductor | 7: Fan motor(s) |
| A3: Earth conductor | 8: Liquid level switch |
| A4: Valve control | 9: JP 0 inserted with the establishment of a group network |
| 1: Antifreeze sensor | 10: Receiver |
| 2: Probe, ambient air | 11: Cabled remote control |
| 3: Swing motor | |
| 4: Internal network | |



Valve assembly connection

The valve assemblies are connected at the "V" and "N" terminals.

KWD 70-100

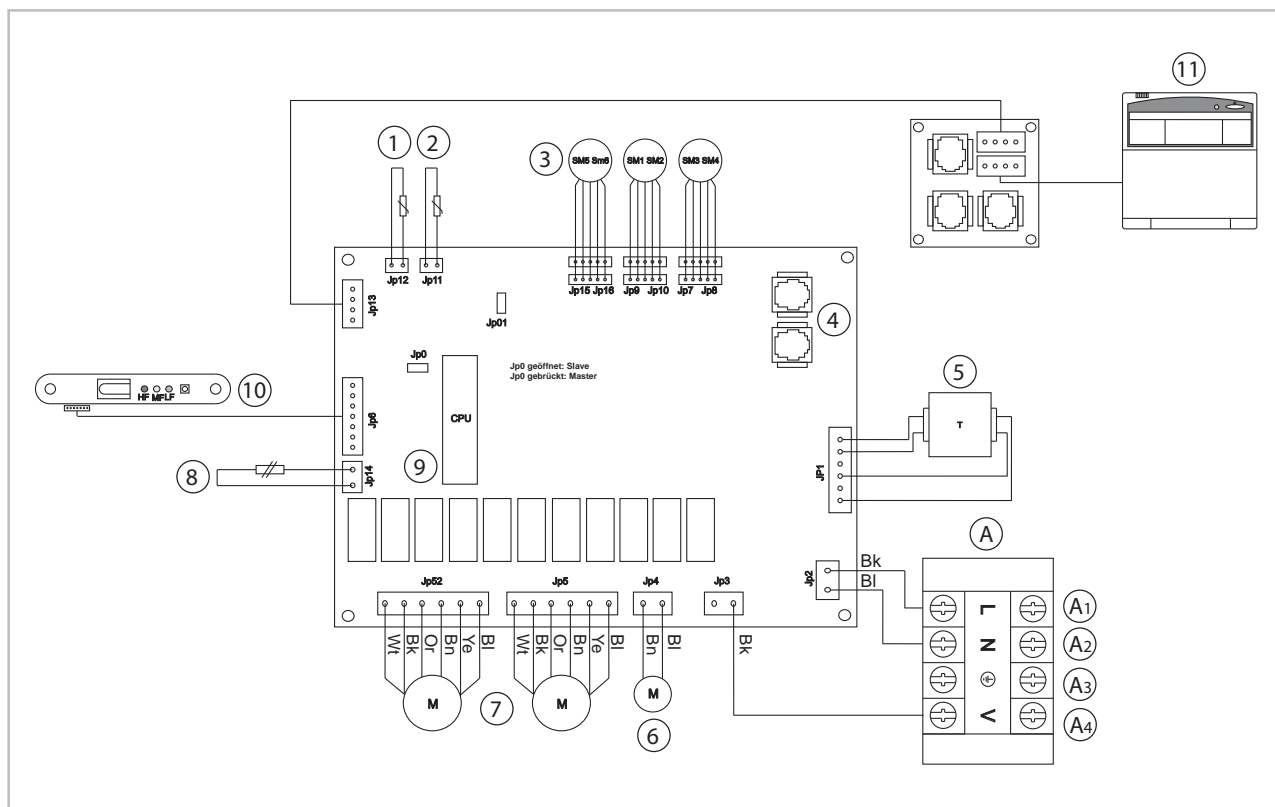


Fig. 47: Electrical drawings KWD 70-100

- | | |
|-----------------------|--|
| A: Terminal block | 5: Transformer |
| A1: Phase conductor | 6: Condensate pump |
| A2: Neutral conductor | 7: Fan motor(s) |
| A3: Earth conductor | 8: Liquid level switch |
| A4: Valve control | 9: JP 0 inserted with the establishment of a group network |
| 1: Antifreeze sensor | 10: Receiver |
| 2: Probe, ambient air | 11: Cabled remote control |
| 3: Swing motor | |
| 4: Internal network | |



Valve assembly connection

The valve assemblies are connected at the "V" and "N" terminals.

9 Internal network

Up to 32 KWD units can be operated at the same time thanks to the parallel connection via a bus line (accessory). The units can access this network (internal network) at the same time.

The network can have one leading unit (master) and up to 31 following units (slave).

The units are connected together via a four-core bus line.

Bus connection lines, which can be extended up to a maximum of 1000 m with 0.6 mm² diameter telephone wire, are available as accessories (observe polarity!).

One connection line is required for the first and last unit and two connection lines are required for the middle units

Network with infrared remote controls

- The standard infrared remote control operates a master unit. All slave units are set according to the programming.

- The infrared remote control or the cabled remote control (accessory) can be used for user-specific operation of an individual slave unit.

Implementation

- A master unit is addressed by means of jumper JP0 inserted on the control board or a jumper not being inserted for the slave unit.

Network with cabled remote controls

- The cabled remote control that is available as an accessory operates a master unit. All slave units with cabled remote control can be programmed individually from the master unit directly or as a complete group.
- The cabled remote control (accessory) can be used for user-specific operation of an individual slave unit.

Implementation

- The addresses for the master and slave units are assigned by configuring the cabled remote control (see separate installation instructions).

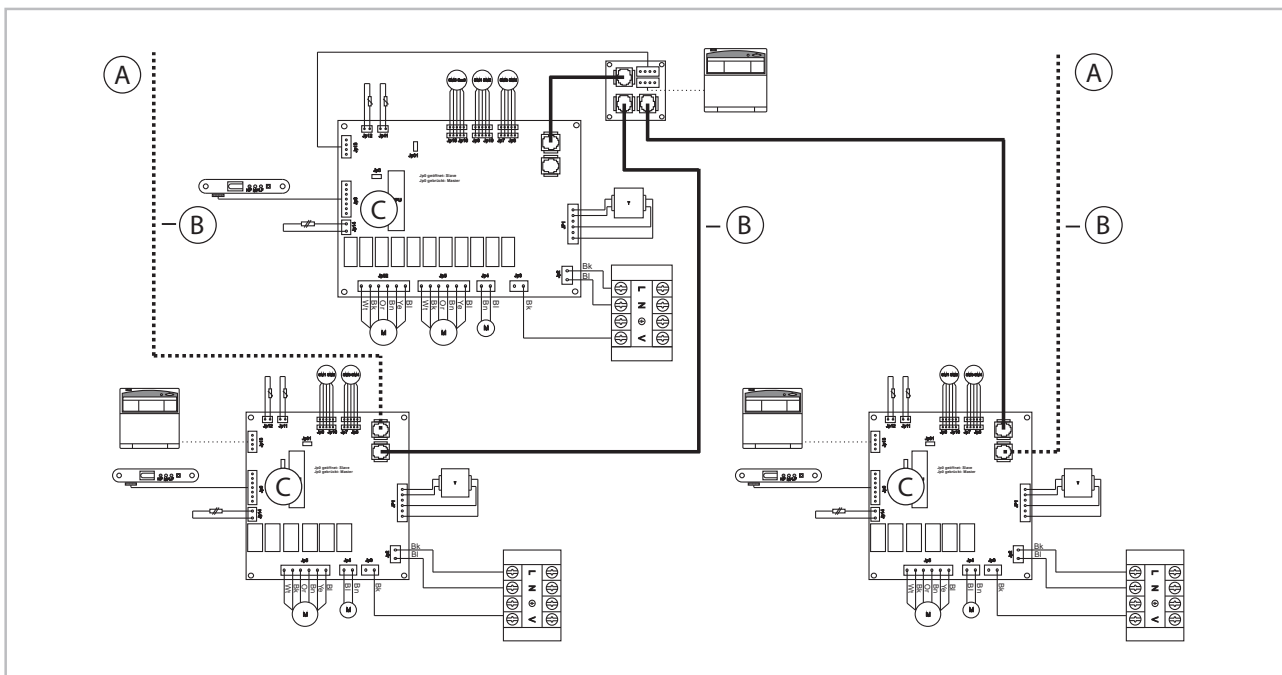


Fig. 48: Internal network wiring diagram

- A: Bus line to the next unit possible
 B: 4-core cable
 C: JP0 bridged = Master (Infrared remote control)/JP0 open = Slave (Infrared remote control)

10 Leak testing

The leak test is carried out after the connection has been made.

1. ➤ Flush the system twice with tap water.
2. ➤ Clean the sieve insert on the dirt trap.
3. ➤ Fill the system with water again and bleed the unit at the manual bleed valves.
4. ➤ Adjust the test pressure to at least 200 kPa (2.0 bar).
5. ➤ Check the connections after a period of at least 24 hours for leaking water. If water is visible, the connection has not been established properly. Tighten the connection or establish a new connection.
6. ➤ After a successful leak test, remove the excess pressure from the medium piping if a water-glycol mixture is used or adjust the non-circulating pressure to the required system pressure.

11 Before commissioning

Anti-freeze protection for the medium

If a water-glycol mixture is used, it is to be pre-mixed before being put in the system. The desired concentration is then to be checked.

Bleeding the system

- Air may still be in the pipe lines after the leak testing. This is carried during operation of the circulation pump to the automatic bleeding valves or to the cold water drain. It is necessary to bleed again here.
- The non-circulating pressure must then be adjusted to the required system pressure.

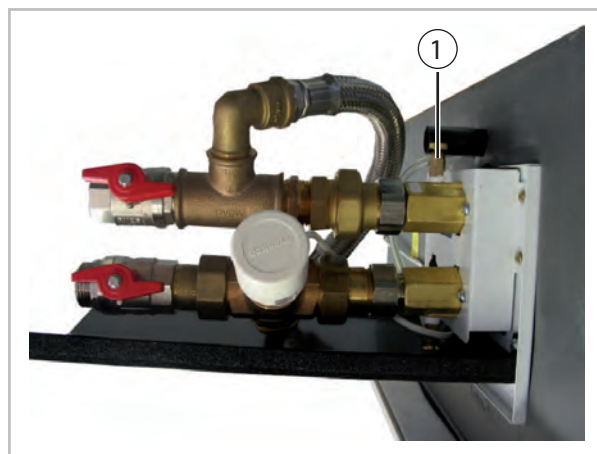


Fig. 49: Manual bleeding

1: Manual bleeding

! NOTICE!

During manual bleeding, any glycol mixtures which escape must be disposed of separately. Do not feed them into the condensate tray!

Diaphragm expansion vessel

- The preliminary pressure for the diaphragm expansion vessel must be adjusted individually to the system layout, the volume of the medium and the installation site.

Valves for hydronic balancing

- The calculated excess pressure in the pipe network layout at the individual cold water outlets must be adjusted with the hydronic balancing valves.

Safety valve

- The safety valves and their correct function must be checked.
- The drain line for the valves is to be checked for function and leak tightness.

12 Commissioning

! NOTICE!

Commissioning should only be performed by specially trained personnel and documented after the certificate has been issued.

! NOTICE!

Observe the manuals for the unit and all other components when commissioning the entire system.

Function test for cooling operating mode

1. ➤ Switch the power supply on.
2. ➤ Open all shut-off valves if necessary.
3. ➤ Switch on the chiller and the corresponding circulation pump. The outlet temperature must be between +4 and +18 °C.
4. ➤ Use the remote control to switch on the unit and select the cooling mode, maximum fan speed and lowest target temperature.
5. ➤ Measure and record all the required values in the commissioning report and check the safety functions.
6. ➤ Check the unit control system using the functions described in the "Operation" chapter.
7. ➤ Check that the condensate drainage line is functioning correctly by pouring distilled water into the condensate tray. A bottle with a spout is recommended for pouring the water into the condensate tray.

Function test of heating operating mode

1. ➤ Switch the power supply on.
2. ➤ Open all shut-off valves if necessary.
3. ➤ Switch on the heating system and the corresponding circulation pump. The outlet temperature must lie between +35 and +70 °C.
4. ➤ Use the remote control to switch on the unit and select the heating mode, maximum fan speed and highest target temperature.
5. ➤ Measure and record all the required values in the commissioning report and check the safety functions.
6. ➤ Check the unit control system using the functions described in the "Operation" chapter.

Final tasks

- Mount all removed parts.
- Familiarise the operator with the system.

13 Shutdown

Temporary shutdown

1. ➤ Let the unit run for 2 to 3 hours in circulation mode, or in cooling mode at maximum temperature, to extract any residual humidity from the unit.
2. ➤ Shut down the system using the remote control.
3. ➤ Switch off the power supply to the unit.
4. ➤ Check the unit for visible signs of damage and clean it as described in the "Care and maintenance" chapter.

Permanent shutdown

Ensure that units and components are disposed of in accordance with local regulations, e.g. through authorised disposal and recycling specialists or at collection points.

REMKO GmbH & Co. KG or your contractual partner will be pleased to provide a list of certified firms in your area.

14 Troubleshooting and customer service

The unit and components are manufactured using state-of-the-art production methods and tested several times to verify that they function correctly. However, if malfunctions should occur, please check the functions as detailed in the list below. For systems with an indoor unit and outdoor unit, refer to the chapter "Troubleshooting and customer service" in both operating manuals. Please inform your dealer if the unit is still not working correctly after all function checks have been performed!

Operational malfunctions

Malfunction	Possible causes	Checks	Remedial measures
The unit does not start or switches itself off	Power failure, under-voltage	Does all other electrical equipment function correctly?	Check voltage and if necessary wait until turned on again.
	Defective mains fuse/main switch turned off	Are all lighting circuits functioning correctly?	Replace the mains fuse. Close main circuit breaker
	Damaged power supply	Does all other electrical equipment function correctly?	Repair by specialist firm
	Wait time after switching on is too short	Does a restart occur after around 5 minutes?	Plan for longer wait period
	Operational temperature range too low or exceeded	Are the fans in the indoor unit and outdoor unit working correctly?	Take into account the temperature range for the indoor unit and outdoor unit
	Electrical surges caused by thunderstorms	Have there been lightning strikes in the area recently?	Switch off the mains breaker and switch it back on. Have it inspected by a specialist
	Malfunction of the external condensate pump	Has the pump shut down due to a malfunction?	Check and if necessary clean the pump
	Heating mode: Minimum heat exchanger temperature not reached	Is the unit in the warm-up or cool-down phase (see "Malfunction indicated by flashing code")?	Check or increase the inlet temperature
The unit does not respond to the remote control	Transmission distance too far/receiver affected by interference	Does the indoor unit beep when pressing a key?	Reduce the distance to less than 6 m or change position
	Remote control is faulty	Is the unit running in manual mode?	Replace the remote control
	Receiver or transmitter unit exposed to excessive solar radiation	Does it function correctly in the shade?	Place the receiver and/or transmitter unit in the shade
	Electromagnetic fields are interfering with transmission	Does it function after removing potential sources of interference?	Signal is not transmitted when interference sources are operational
	Key on remote control stuck/dual key operation	Does the "Transmitting" symbol appear on the display?	Release the key/only press one key
	Batteries in remote control are flat	Have new batteries been inserted? Is the display incomplete?	Insert new batteries

Malfunction	Possible causes	Checks	Remedial measures
The unit is running but only provides reduced or no cooling or heating capacity	Valve assembly jammed, not working, not yet fully activated	Is electrical power present at the valve head or has the time period of 3 minutes after activation passed?	Have the valve head replaced or wait for time period to pass
	Filter is dirty/air inlet/outlet opening is blocked by debris	Have the filters been cleaned?	Clean the filters
	Windows and doors open. Heating/cooling load has increased	Have structural/usage modifications been made?	Close windows and doors/ install additional units
	Cooling mode is not set	Does the "cooling" symbol appear on the display?	Correct the settings for the unit
	Inlet temperature in cooling mode too high	Is the inlet temperature approx. + 5 - + 10 °C and is the circulation pump working?	Reduce inlet temperature
	Inlet temperature in heating mode too low	Is the inlet temperature approx. + 24 - + 45 °C and is the circulation pump working?	Increase inlet temperature.
Condensate discharge on unit	Drainage pipe on collection container clogged/damaged	Can the condensate drain off without any obstruction?	Clean the drainage pipe and collection container
	Faulty external condensate pump or float	Is the collection tray full of water and the pump not running?	Call out a specialist to replace the pump
	Condensate has not drained away and has collected in the condensate drainage line	Is there an incline on the condensate drainage line and is it clear?	Route the condensate drainage line with an incline and clean it
	Condensate does not drain off	Are the condensate drainage lines unblocked and is there a steady incline? Are the condensate pump and liquid level switch functioning correctly?	Route the condensate drainage line with an incline and clean it. Replace the faulty liquid level switch or condensate pump.
	Float is stuck or jammed due to excessive dirt	Are the LEDs on the receiver unit of the indoor unit flashing?	Should be cleaned by specialist firm

Malfunction indicated by flashing code

H (red)	M (yellow)	L (green)	Cause	Required action
On			Fan at max. speed	Normal operating condition
	On		Fan at medium speed	Normal operating condition
		On	Fan at low speed	Normal operating condition
	Flashes		Heating mode: Warm-up phase	Wait approx. 1 minute
		Flashes	Heating mode: Cool-down phase	Wait approx. 1 minute
On	Flashes	Flashes	Register probe faulty / tripped	Contact specialist dealer
Flashes			Cooling mode: Anti-freeze protection, indoor unit	Wait approx. 1 minute
	Flashes	Flashes	Heating mode: Overheating protection for indoor unit	Wait approx. 1 minute
Flashes		Flashes	Indoor unit ambient air probe faulty/tripped	Contact specialist dealer
Flashes	Flashes	Flashes	Condensate pump liquid level switch faulty/tripped	Contact specialist dealer

See the operating instructions of the relevant outdoor unit for further fault diagnosis and troubleshooting.

15 Care and maintenance

Regular care and observation of some basic points will ensure trouble-free operation and a long service life.



DANGER!

Prior to performing any work, ensure the equipment is disconnected from the voltage supply and secured to prevent accidental switch-on!

Care

- Ensure the unit is protected against dirt, mould and other deposits.
- Only clean the unit using a damp cloth. Do not use any caustic, abrasive or solvent-based cleaning products. Do not use a jet of water.
- Clean the fins on the unit prior to long shut-down periods.

Maintenance

- It is recommended that you take out a maintenance contract with an annual service from an appropriate specialist firm.



This enables you to ensure the operational reliability of the plant at all times!

Cleaning the cover on the indoor unit

1. ➡ Disconnect the power supply to the unit.
2. ➡ Open and fold down the air inlet guard on the cover.
3. ➡ Clean the grill and cover with a soft, damp cloth.
4. ➡ Switch the power supply back on.

Type of task	Commis- sioning	Monthly	Half- yearly	Yearly
Checks / maintenance / inspection				
General	•			•
Check voltage and current	•			•
Check function of compressor / fans	•			•
Dirt on condenser / evaporator	•	•		
Check the refrigerant volume	•		•	
Check condensate drainage	•		•	
Check insulation	•			•
Check moving parts	•			•
Sealing test for cooling cycle	•			• ¹⁾

¹⁾ see note

! NOTICE!

Statutory regulations require an annual leak test for the cooling cycle dependant on the refrigerant quantity. Inspection and documentation of the work performed is to be carried out by specialist technicians.

Air filter for indoor unit

Clean the air filter at intervals of no more than 2 weeks. Reduce this interval if the air is especially dirty.

Cleaning the filter

1. ➤ Disconnect the power supply to the unit.
2. ➤ Open and fold down the air inlet guard on the cover. The filter is held in place by the flaps screwed in at the side of the guard (Fig. 50).
3. ➤ Tilt the filter and lift it out (Fig. 51).
4. ➤ Clean the filter with a commercially available vacuum cleaner (Fig. 52). To do so, turn the dirty side so it is facing upwards.
5. ➤ Dirt can also be removed by carefully cleaning with lukewarm water and mild cleaning agents. The dirty side should be face down (Fig. 53).
6. ➤ If water is used, let the filter dry out properly in the air before fitting it back into the unit.
7. ➤ Carefully insert the filter. Ensure that it locates correctly.
8. ➤ Close the cover as described above but in reverse order.
9. ➤ Switch the power supply back on.
10. ➤ Switch the unit back on.



Fig. 50: Air inlet grill on the cover



Fig. 51: Pull out the filter



Fig. 52: Cleaning with a vacuum cleaner



Fig. 53: Cleaning with lukewarm water

Cleaning the condensate pump

The indoor unit includes a built-in condensate pump for pumping the condensate to a drain at a higher level.

The pump is more or less maintenance-free. The condensate drainage lines should be checked for dirt at regular intervals. Clean them as required.

If an external pump is also used, observe the maintenance and care instructions in the separate operating instructions.

16 Exploded view and spare parts lists

16.1 Exploded view of the unit KWD 25-55

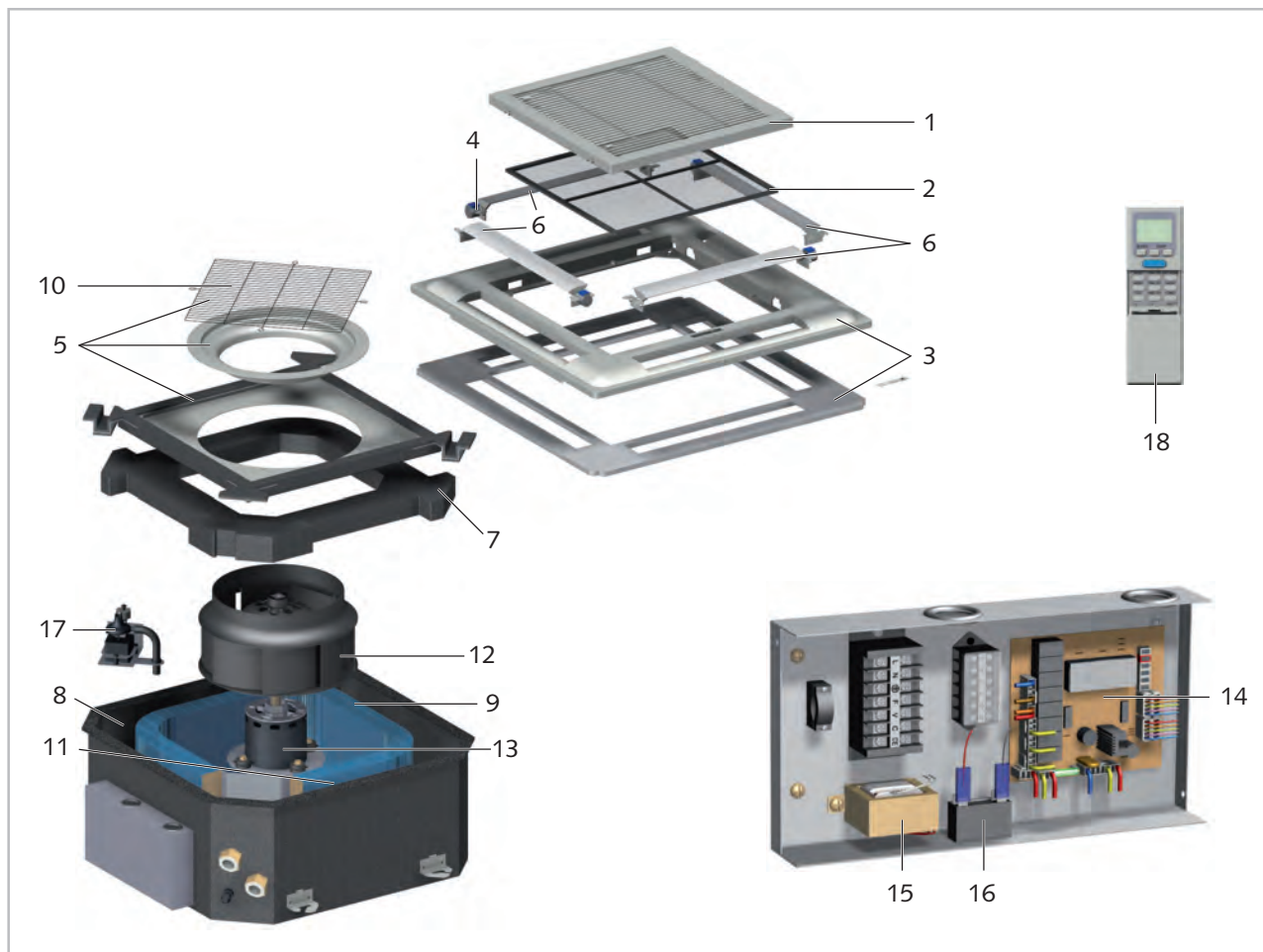


Fig. 54: Exploded view of the unit KWD 25-55

We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

16.2 Spare parts list KWD 25-55



IMPORTANT!

To ensure the correct delivery of spare parts, please always the device type with the corresponding serial number (see type plate)

No.	Designation
1	Air inlet grill
2	Air filter
3	Cover, complete
4	Swing motor
5	Air inlet, module
6	Outlet fins, set of 4
7	Condensate tray
8	Condensate hose
9	Fin vaporiser
10	Probe, ambient air
11	Probe, anti-freeze protection
12	Fan blade
13	Fan motor
14	Control board
15	Transformer
16	Condenser fan
17	Condensation pump cpl.
18	IR remote control
	Spare parts not illustrated
	Condensate liquid level switch
	Display board
	Additional condensate tray, valve assembly

16.3 Exploded view of the unit KWD 70-100

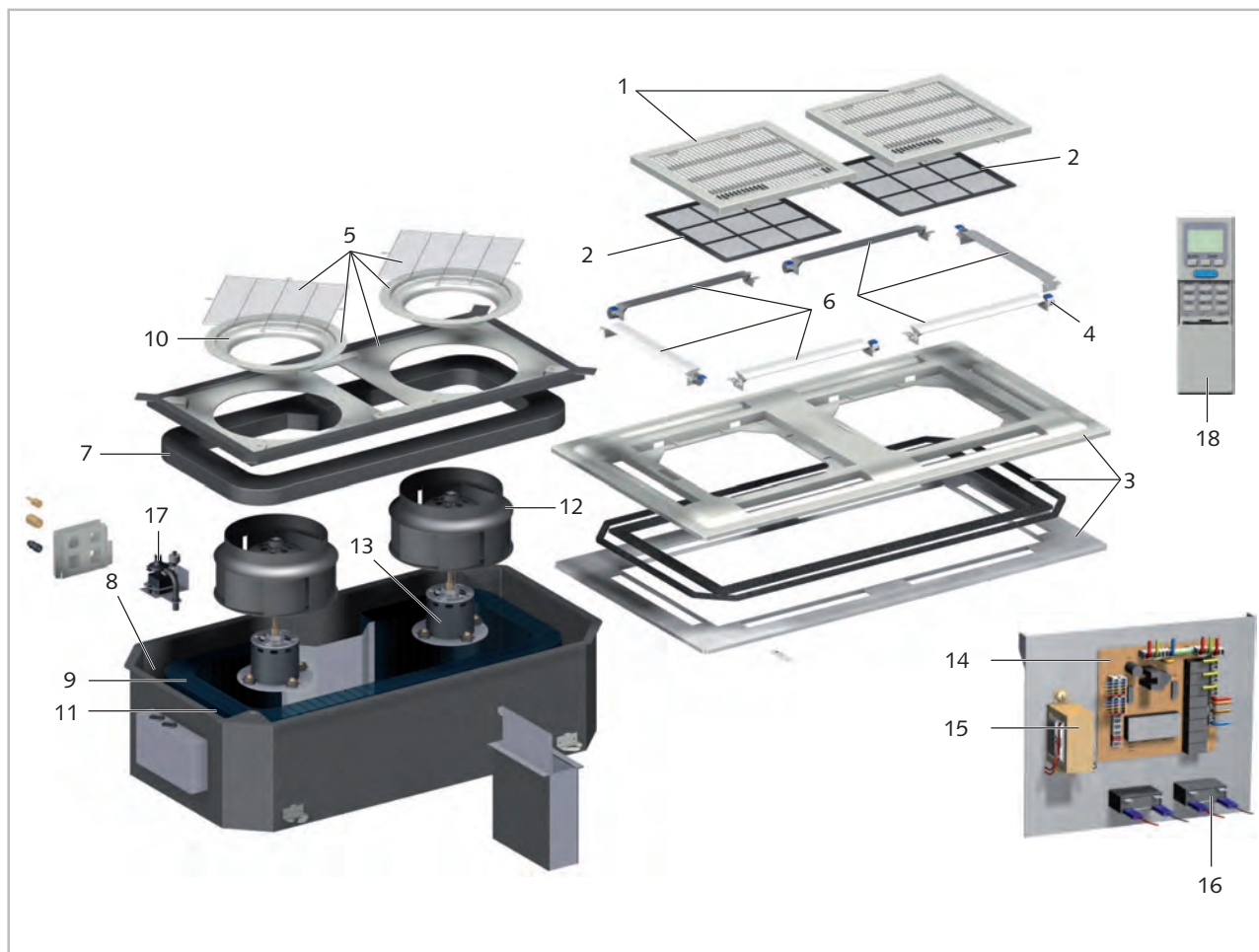


Fig. 55: Exploded view of the unit KWD 70-100

We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

16.4 Spare parts list KWD 70-100



IMPORTANT!

To ensure the correct delivery of spare parts, please always the device type with the corresponding serial number (see type plate)

No.	Designation
1	Air inlet grill
2	Air filter
3	Cover, complete
4	Swing motor
5	Air inlet, module
6	Outlet fins, set of 6
7	Condensate tray
8	Condensate hose
9	Fin vaporiser
10	Probe, ambient air
11	Probe, anti-freeze protection
12	Fan blade
13	Fan motor
14	Control board
15	Transformer
16	Condenser fan
17	Condensation pump cpl.
18	IR remote control
	Spare parts not illustrated
	Network board
	Condensate liquid level switch
	Display board
	Additional condensate tray, valve assembly

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