

Operating and installation instructions

REMKO RVD series

Ceiling cassettes for cooling and heating

RVD 355 DC, RVD 525 DC, RVD 685 DC, RVD 1055 DC





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!

Translation of the original

Table of contents

1	Safety and usage instructions	5
1.1	General safety notes	5
1.2	Identification of notes	5
1.3	Personnel qualifications	5
1.4	Dangers of failure to observe the safety notes	5
1.5	Safety-conscious working	6
1.6	Safety instructions for the operator	6
1.7	Safety notes for installation, maintenance and inspection	6
1.8	Unauthorised modification and changes	7
1.9	Intended use	7
1.10	Warranty	7
1.11	Transport and packaging	7
1.12	Environmental protection and recycling	8
2	Technical data	9
2.1	Unit data	9
2.2	Unit dimensions, outdoor unit	12
2.3	Unit dimensions, indoor unit	13
3	Design and function	14
3.1	Unit description	14
4	Operation	15
4.1	General notes	15
4.2	Display on indoor unit	16
4.3	Keys on the remote control	17
5	Installation instructions for qualified personnel	23
5.1	Important notes prior to installation	23
5.2	Wall openings	23
5.3	Installation materials	23
5.4	Selection of installation location	24
5.5	Minimum clearances	25
5.6	Oil return measures	26
6	Installation	26
6.1	Unit installation	26
6.2	Connection of refrigerant piping	28
6.3	Leak testing	30
6.4	Adding refrigerant	31
7	Condensate drainage connection and safe drainage	31
8	Electrical wiring	33
8.1	General connection and safety instructions	33
8.2	Connecting the indoor unit	33
8.3	Outdoor unit connection	34
8.4	Electrical wiring diagram	35
8.5	Electrical drawings	39
8.6	Connection of a superordinate controller provided by the customer	47
9	Before commissioning	48
10	Commissioning	48
11	Shutdown	49

REMKO RVD series

12	Troubleshooting, customer service and fault analysis.....	50
12.1	Troubleshooting and customer service.....	50
12.2	Indoor unit fault analysis.....	54
12.3	Resistances of the temperature probes.....	65
13	Care and maintenance.....	68
14	Exploded view and spare parts lists.....	70
14.1	Exploded view - Indoor unit RVD 355-525 DC	70
14.2	Spare parts list - Indoor unit RVD 355-525 DC.....	71
14.3	Exploded view - Indoor unit RVD 685-1055 DC	72
14.4	Spare parts list - Indoor unit RVD 685-1055 DC.....	73
15	Exploded view - Outdoor unit RVD 355 DC.....	74
16	Spare parts list - Outdoor unit RVD 355 DC.....	75
17	Exploded view - Outdoor unit RVD 525 DC.....	76
18	Spare parts list - Outdoor unit RVD 525 DC.....	77
19	Exploded view - Outdoor unit RVD 685 DC.....	78
20	Spare parts list - Outdoor unit RVD 685 DC.....	79
21	Exploded view - Outdoor unit RVD 1055 DC.....	80
22	Spare parts list - Outdoor unit RVD 1055 DC.....	81
23	Index.....	83

1 Safety and usage instructions

1.1 General safety notes

Carefully read the operating manual before commissioning the units or their components for the first time. It provides useful tips and notes such as hazard warnings to prevent injury and material damage. Failure to follow the directions in this manual can endanger persons, the environment and the equipment itself or its components and will void any claims for liability.

Store this manual and the information required for the operation of this system (e.g. refrigerant data-sheet) in the vicinity of the unit.

The refrigerant used in the system is flammable. If applicable, observe the local safety conditions.



Warning of inflammable substances!

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.

REMKO RVD series

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 instructions 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 (grills) 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 equipment parts or components can lead to burns or injury.
- The units and components must not be exposed to any mechanical load, extreme levels of humidity or extreme temperatures.
- Rooms in which refrigerant may escape shall be adequately aerated and ventilated. Otherwise, a risk of suffocation or fire exists.
- Do not leave children unsupervised when close to the system.
- Commissioning must be performed by authorised specialists exclusively. Deficient commissioning may lead to water leaks, electric shocks or fire. Commissioning must take place as described in the user manual.
- Only instruct authorised specialist personnel to perform maintenance or servicing.
- The system is filled with a flammable refrigerant. Never thaw any frozen unit components independently!
- Do not operate any further devices that produce high heat or naked flames in the same room.

- All housing parts and unit openings, e.g. air inlets and outlets, must be kept clear.
- The units must be inspected by a service technician to ensure that they are safe to use and fully functional at least once yearly. 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

- The refrigerant R32 used in the system is flammable. If applicable, observe the local safety conditions.
- Keep the cooling circuit clear of other gases and foreign substances. Only fill the cooling circuit with the refrigerant R32.
- Only use the accessories, components and appropriately marked parts provided. The use of non-standardised components may result in water leaks, electric shocks and fire.
- Only install and store the units in rooms larger than 4 m². With a failure to comply, leaks may result in the room filling with a flammable mixture!

The minimum room size of 4 m² required for installation and storage pertains to the basic fill quantity of the unit. This varies according to the installation type and total fill quantity of the system. The calculation must take place in accordance with valid DIN standards. Make sure that the installation site is suitable for safe unit operation.
- Only mount the unit components on structurally suitable brickwork.
- The units must not be installed in rooms in which further devices that produce heat are operated (heaters, open hearths).
- Make sure the installation room is sufficiently ventilated.
- Interventions in the cooling circuit are only possible after completely draining the refrigerant. Never solder or grind unit components!
- Note that refrigerant may be odourless.
- Never operate the air conditioning unit in a humid room, such as a bathroom or laundry room. If the humidity is too high, this can cause short circuits on electrical parts.
- The product must be correctly earthed at all times, otherwise it may induce electric shocks.
- Attach the condensate drain as described in the operating manual. The inadequate drainage of condensate can lead to water damage in your apartment.
- All persons who intervene in the cooling circuit must hold a valid certificate from the chamber of industry and commerce, which confirms their ability to work with refrigerant.

- 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.
- Regional regulations and laws as well as the 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.
- 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 may not be modified or bypassed.
- The connection of the indoor unit must be established as a permanent connection; a detachable, reusable connection is not permissible.

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, the units and the additional fittings with which they are equipped are only intended to be used as an air-conditioner for the purpose of cooling or heating the air in an enclosed space.

Any different or additional use is a non-intended use. The manufacturer/supplier assumes no liability for damages arising from a 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!

REMKO RVD series

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		RVD 355 DC	RVD 525 DC	RVD 685 DC	RVD 1055 DC
Operating mode		Inverter ceiling cassette-room air conditioner combination for cooling and heating			
Nominal cooling output ¹⁾	kW	3.5 (1.5-5.3)	5.3 (2.9-5.7)	7.0 (3.2-8.2)	10.5 (4.0-12.0)
Energy efficiency ratio SEER ¹⁾		7.8	6.1		
Rated power consumption, electrical cooling ¹⁾	kW	0.85	1.63	2.19	3.95
Rated elec. curr. consump., cooling ¹⁾	A	3.8	7.2	9.5	6.6
Power consumption, annual, Q _{CE} ³⁾	kWh	157	304	402	602
Energy efficiency ratio, cooling ¹⁾		A++			
Nominal heat capacity ²⁾	kW	3.1 (1.0-5.6)	4.2 (2.4-6.1)	5.4 (2.4-8.7)	8.1 (2.6-13.2)
Energy efficiency ratio SCOP ⁴⁾		4.6	4.0		
Rated power consumption, electrical heating ²⁾	kW	1.10	1.46	2.05	3.00
Rated elec. curr. consump., heating ²⁾	A	5.0	6.4	8.9	5.0
Power consumption, annual, Q _{HE} ³⁾	kWh	959	1435	1890	2835
Energy efficiency ratio, heating ²⁾		A++	A+		
Max. power consumption	kW	1.8	1.9	2.9	4.8
Max. current consumption	A	7.9	8.5	12.5	8.3
EDP no.		1623845	1623855	1623865	1623875

¹⁾ Air inlet temp. TK 27 °C/FK 19 °C, outside temperature TK 35 °C, FK 24 °C, max. air flow volume, 5 m pipe length

²⁾ Air inlet temp. TK 20 °C, outside temperature TK 7 °C, FK 6 °C, max. air flow volume, 5 m pipe length

³⁾ The specified value is based on results from standard testing.
The actual consumption depends on the use and location of the unit

⁴⁾ The specified value is based on the average heating period

REMKO RVD series

Associated indoor unit / series		RVD 355 DC IT	RVD 525 DC IT	RVD 685 DC IT	RVD 1055 DC IT
Power supply	V/Ph/Hz	230/1~/50			
Application area (room volume), approx.	m ³	110	160	230	320
Adjustment range room temperature	°C	+17 to +30			
Operating range	°C/r.H.%	+17 to +30 / 35-65			
Air flow volume per stage	m ³ /h	416/504/ 617	540/625/ 750	1032/1200/ 1378	1438/1620/ 1775
Sound pressure level per stage ⁵⁾	dB (A)	33/36/41	36/39/43	40/43/47	41/47/51
Enclosure class	IP	X0			
Refrigerant connection, liquid pipe	Inches (mm)	1/4 (6.35)		3/8 (9.52)	
Refrigerant connection, suction pipe	Inches (mm)	3/8 (9.52)	1/2 (12.7)	5/8 (15.9)	
Condensate drainage connection	mm	25		32	
Condensate pump, flow rate, max.	mm WS	500		750	
Dimensions: Length/width/depth	mm	570/570/260		840/840/245	
Cover dimensions: Length/width/depth	mm	647/647/50		950/950/55	
Weight	kg	18.7		28.0	32.5
EDP no.		1623847	1623857	1623867	1623877

⁵⁾ At distance of 1 m in the open air; specified values are maximum values

Associated outdoor unit / series		RVD 355 DC AT	RVD 525 DC AT	RVD 685 DC AT	RVD 1055 DC AT
Power supply	V/Ph/Hz	230/1~/50			400/3~/50
Operating range, cooling	°C	+5 to +50 ⁷⁾			
Operating range, heating	°C	+5 to +24 ⁷⁾			
Air flow rate, max.	m ³ /h	2000		2700	4000
Enclosure class	IP	24			
Sound power level max.	dB (A)	63		64	68
Sound pressure level ⁵⁾	dB (A)	56	55	62	64
Refrigerant ⁶⁾		R32			
Refrigerant, basic quantity	kg	0.87	1.15	1.50	2.40
CO ₂ equivalent	t	0.59	0.78	1.01	1.62
Operating pressure, max.	kPa	4300/1700			
Refrigerant, additional quantity >5m	g/m	15		30	
Refrigerant piping, max. length	m	25	30	50	65
Refrigerant piping, max. height	m	10	20	25	30
Refrigerant connection, liquid pipe	Inches (mm)	1/4 (6.35)		3/8 (9.52)	
Refrigerant connection, suction pipe	Inches (mm)	3/8 (9.52)	1/2 (12.7)	5/8 (15.9)	
Dimensions: Height / width / depth	mm	554/800/333		702/845/363	810/946/410
Weight	kg	34.7	33.7	49.4	81.5
EDP no.		1623846	1623856	1623866	1623876

⁵⁾ At distance of 1 m in the open air; specified values are maximum values

⁶⁾ Contains greenhouse gas per the Kyoto protocol, GWP 675 (for further information, see chapter "Adding refrigerant")

⁷⁾ Can be expanded up to -15 °C with optional winter fan speed control

REMKO RVD series

2.2 Unit dimensions, outdoor unit

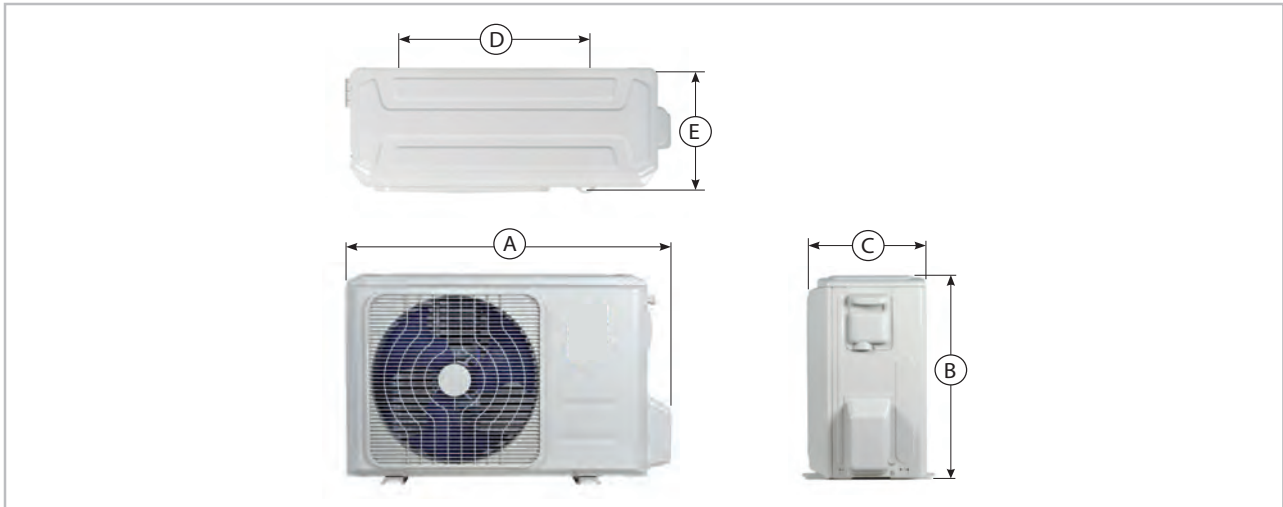


Fig. 1: Dimensions RVD 355-1055 DC AT (all measurements in mm)

Measurements (mm)	A	B	C	D	E
RVD 355-525 DC	800	554	333	514	340
RVD 685 DC	845	702	363	540	350
RVD 1055 DC	946	810	410	673	403

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

2.3 Unit dimensions, indoor unit

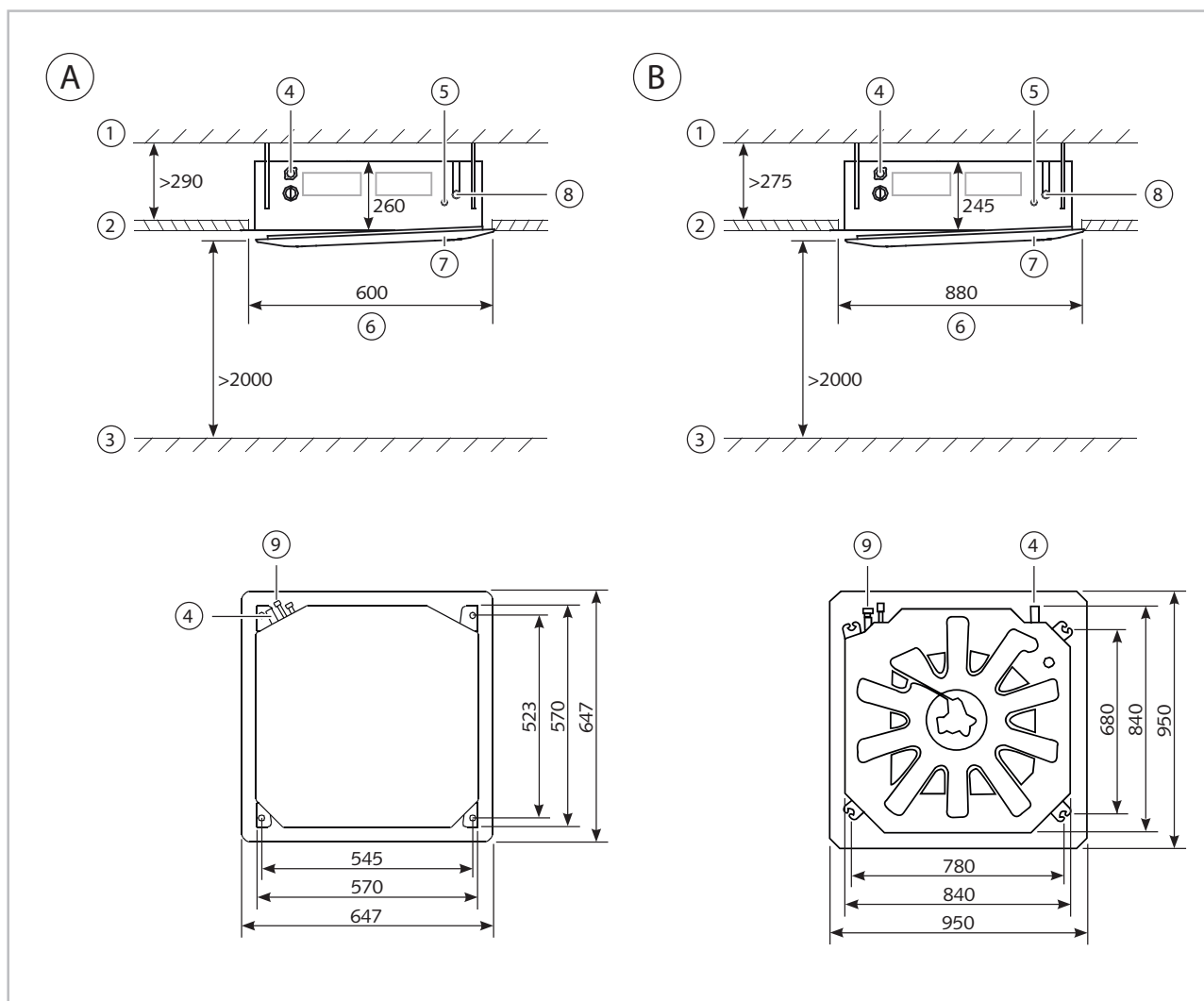


Fig. 2: Dimensions (all measurements in mm)

A: RVD 355-525 DC
B: RVD 685-1055 DC

1: Ceiling
2: Suspended ceiling
3: Floor
4: Condensate drainage connection

5: Injection pipe connection
6: Ceiling cut-out
7: Unit trim
8: Suction pipe connection
9: Refrigerant piping connections

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

REMKO RVD series

3 Design and function

3.1 Unit description

The RVD 355-1055 DC room air conditioners have a REMKO RVD...AT outdoor unit as well as an RVD...IT indoor unit.

In cooling mode, the outdoor unit serves to output the heat extracted by the indoor unit from the room being cooled. In heating mode, the heat taken up by the outdoor unit can be discharged by the indoor unit into the room to be heated. In both operating modes, the output produced by the compressor precisely matches requirements, and thereby regulates the nominal temperature with minimal temperature deviations. This "inverter technology" results in energy savings over conventional split systems and also reduces noise emissions to a particularly low level. The outdoor unit can be installed in an outdoor area or, providing that certain requirements are met, an indoor area. The outdoor unit consists of a cooling cycle with compressor, fin condenser, condenser fan, reversing valve and throttle element. The outdoor unit is controlled by the regulation of the indoor unit.

The indoor unit is designed for indoor areas, for 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 indoor unit consists of a fin evaporator, evaporator fan, regulation system and condensate tray with condensate pump.

Floor consoles, wall consoles, refrigerant piping and winter fan speed control are available as accessories.

Refrigerant piping is used to connect the indoor unit to the outdoor unit.

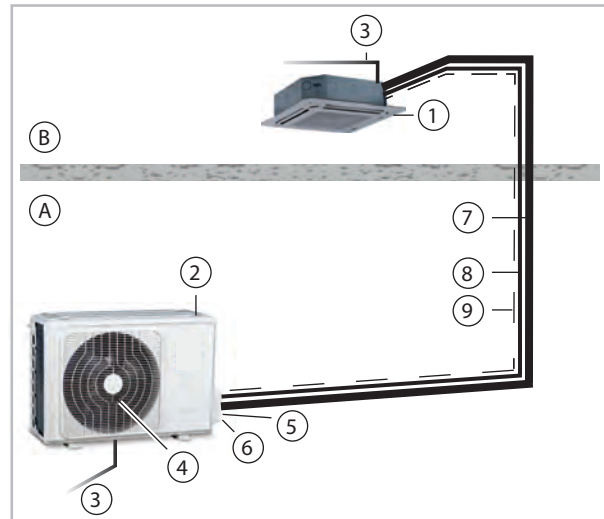


Fig. 3: System layout RVD 355-1055 DC

- A: Outdoor area
- B: Indoor area
- 1: Indoor units
- 2: Outdoor unit
- 3: Condensate drainage line
- 4: Condenser fan
- 5: Power supply
- 6: Shut-off valve
- 7: Suction pipe
- 8: Injection pipe
- 9: Control lines

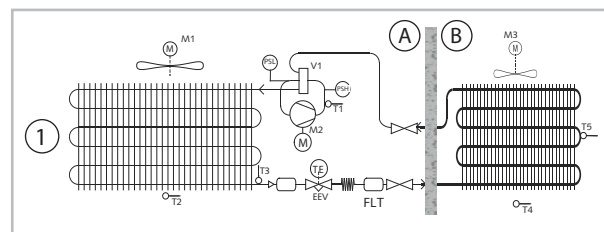


Fig. 4: Cooling cycle schematic RVD 355-1055 DC

- A: Outdoor area
- B: Indoor area
- 1: RVD 355-1055 DC
- M1: Condenser fan
- M2: Compressor
- M3: Evaporator fan IT
- V1: Changeover valve C/H
- EEV: Elec. Expansion valve
- FLT: Filter
- OEL: Oil return line
- PSH: High pressure switch AT
- PSL: Low pressure switch AT
- T1: Probe, heat gas AT
- T2: Probe, air inlet AT
- T3: Probe, condenser AT
- T4: Probe, air inlet IT
- T5: Probe, evaporator IT

4 Operation

4.1 General notes

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. The indoor unit can also be operated via an optional cabled remote control.

Manual mode

The indoor units can be put into operation manually. Press the MANUAL key on the cover's receiver unit to first activate automatic mode and then test mode. Pressing the button a third time switches the unit off. Pressing the button again switches back to automatic mode.

The following settings apply for manual operation:

Cooling mode: 24 °C, fan speed: AUTO

Test mode: 30 minutes cooling, high fan speed, the IR remote control is deactivated, after 30 minutes the unit changes over to automatic 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.

Two AAA batteries must be inserted into the remote control in preparation. To do so, remove the flap from the battery compartment and insert the batteries the correct way around (see markings). Removing the batteries causes all stored data to be lost. The remote control will then access the default settings, which you are free to customise at any time.



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.

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Wired remote control

Connection of an optional wired remote control

The plug for connection of a wired remote control is located at the panel of the ceiling cassette (s. Fig. 6, [A]). The 5-core cable, coming from the display panel, is marked with the designations A-E (s. Fig. 6, [B]).

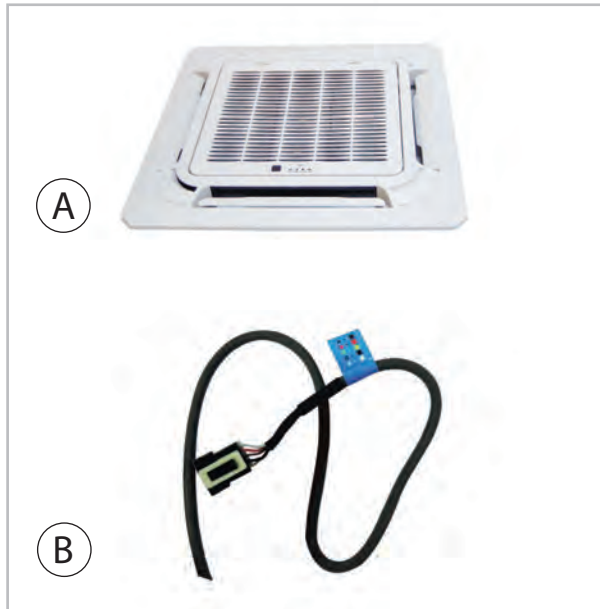


Fig. 6: Wired remote control connection



Alarms are indicated by a code RVD 355-525 DC (see chapter Troubleshooting and customer service).



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!

4.2 Display on indoor unit

Display on indoor unit RVD 355-525 DC

The LED indicators illuminate to indicate the settings:

OPERATION LED green = unit switched on

TIMER LED yellow = timer programmed

DEF/FAN LED red = defrosting active/recirculation mode

ALARM LED red = alarm present

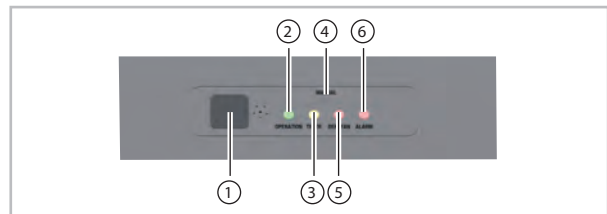


Fig. 7: Display on the unit RVD 355-525 DC

- 1: Unit for receiving signals from the remote control
- 2: Operation display
- 3: Timer indicator
- 4: Manual operation key
- 5: Defrosting fan
- 6: Malfunction indication

Display on indoor unit RVD 685-1055 DC

The LED indicators illuminate to indicate the settings:

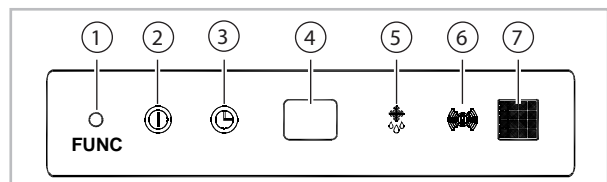


Fig. 8: Display on the unit RVD 685-1055 DC

- 1: "Func" key
- 2: Operating lamp
- 3: "Timer" display activated / deactivated
- 4: Digital display
- 5: "Defrost phase" display
- 6: "Alarm" display
- 7: IR receiver

4.3 Keys on the remote control



Fig. 9: Keys on the remote control

① "ON/OFF" key

Press this key to switch the air conditioning unit on and off.

② Operating mode selection

This key is used to set the desired operating mode. The automatic, cooling, dehumidification, heating and recirculation modes are available.

③ Fan speed

Use this key to select the desired fan speed. The automatic, low, medium and high functions are available. Note: In the dehumidification mode, the fan speed cannot be set manually.

④ "SLEEP" key

Activates/deactivates the "SLEEP" function.

Pressing this key will automatically increase or decrease the target temperature by 1 °C within an hour in cooling and heating mode respectively. Press this key to maintain the most convenient temperature and save energy. This function is only available in "Cooling", "Heating" and "Auto" modes. If the unit is working in "SLEEP" mode, this activity is interrupted by pressing the "MODE", "FAN", "Speed" or "ON/OFF" keys.

⑤ "FRESH" key (no function)

⑥ "TURBO" key

Activation of the turbo function makes it possible to reach the setpoint in cooling or heating mode as fast as possible.

⑦ "SELF CLEAN" key (no function)

⑧ "ARROW UP" and "ARROW DOWN" keys

"ARROW UP" key

Press the key in order to increase the setpoint in 1 °C steps to a maximum 30°C.

"ARROW DOWN" key

Press the key in order to reduce the setpoint in 1°C steps to a minimum 17°C.

⑨ "SILENCE/FP" key (no function)

⑩ "TIMER ON" key

Press this key to activate the unit start delay time. Each press of this key increases the delay time by 30 minutes. When the set time on the display exceeds 10.0, each press of the button increases the set time by 60 minutes. To deactivate the delay time, set the time to 0.0.

⑪ "TIMER OFF" key

This key can be used to program the delayed switch-off time. Each press of this key increases the switch-off time by 30 minutes. When the set time on the display exceeds 10.0, each press of the button increases the set time by 60 minutes. To deactivate the switch-off time, set the time to 0.0.

⑫ Swing mode

Press this key to start or stop the swing mode. With the 2-point key, you can change the fin settings on the left side. The right key has no function.

Press this key once to change the angle by 6 degrees. Pressing the key for 2 seconds stops the swing function.

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⑬ "FOLLOW ME" key

This key can be used to activate/deactivate the FOLLOW ME function. In this mode, the room temperature is measured on the remote control. This sends a signal to the indoor unit every 3 minutes. If the remote control does not send a signal to the indoor unit for 7 minutes, this mode is automatically deactivated.

⑭ "LED" key

This activates/deactivates the display on the indoor unit.

Indicators on the LCD

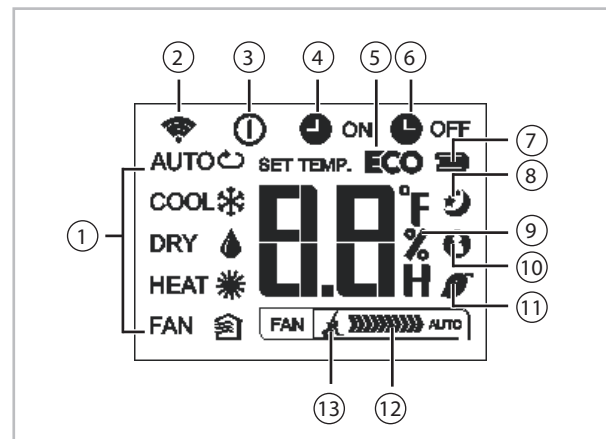


Fig. 10: Indicators on the LCD

- 1: Mode indicator - shows the current operating modes, including Auto (☁), Cooling (❄), Dehumidification (💧), Heating (☀), Fan (🌀) and back to Auto (☁) mode.
- 2: Signal transmission symbol. This symbol appears when signals are being transmitted from the remote control to the indoor unit.
- 3: ON/OFF symbol. This symbol appears when the "ON/OFF" key is pressed. Pressing this key again causes the indicator to go out.
- 4: TIMER ON symbol. This symbol appears when TIMER ON is switched on.
- 5: ECO function (not available)
- 6: TIMER OFF symbol. This symbol appears when TIMER OFF is switched on.
- 7: Battery charge status (weak)
- 8: Sleep symbol. This symbol appears when the "Sleep" function is activated. Pressing this key again causes the indicator to go out.
- 9: Temperature/Timer symbol. Shows the temperature setting (-17°C~30°C). If "FAN" mode is selected, the temperature setting is not displayed. In Timer mode, the ON and OFF settings appear for the TIMER.
- 10: FOLLOW ME symbol. This symbol appears when the "Follow me" function is activated.
- 11: Display of ion generator active (optional)
- 12: Fan speed symbol. This is where the selected fan speeds are displayed: AUTO (no indicator) and the three fan speed settings: 🌀 (slow), 🌀🌀 (medium) and 🌀🌀🌀 (fast). The fan speed is set to "Automatic" when either "Auto" or "Dehumidification" mode is activated.
- 13: Silent mode active (optional)



The illustration of the LCD with all of the symbols present is only intended to provide a clearer overview. During operation, only those symbols relevant to the respective functions appear on the display.

Key functions

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

"Auto" mode (please observe notes!)

Make sure that the indoor unit is connected to the power supply, and is switched on.

The operating mode indicator on the display of the indoor unit begins to flash.

1. ➤ Press the **"MODE"** key to select "Auto" mode.
2. ➤ Press the **"Arrow up/down"** key to set the desired temperature. The temperature can be set between 17 and 30°C, in increments of 1°C.
3. ➤ Press the **"ON/OFF"** key to switch on the air conditioning unit.



Fig. 11: "Auto" mode

"Cooling", "Heating" and "Recirculation" mode

Make sure that the indoor unit is connected to the power supply, and is switched on.

1. ➤ Press the **"MODE"** key to select from operating modes "Cooling", "Heating" or "Recirculation".
2. ➤ Press the **"Arrow up/down"** key to set the desired temperature. The temperature can be set between 17 and 30°C, in increments of 1°C.
3. ➤ Press the **"FAN"** key to select from the four fan speeds (Auto, slow, medium and fast).
4. ➤ Press the **"ON/OFF"** key to switch on the air conditioning unit.



Fig. 12: "Cooling", "Heating" and "Recirculation" mode

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"Dehumidification" mode

Make sure that the indoor unit is connected to the power supply, and is switched on.

The operating mode indicator on the display of the indoor unit begins to flash.

1. ➤ Press the **"MODE"** key to select "Dehumidification" mode.
2. ➤ The temperature setting on the remote control has no effect on unit operation.
3. ➤ Press the **"ON/OFF"** key to switch on the air conditioning unit.



Fig. 13: "Dehumidification" mode



In the "Dehumidification" mode, manual selection of the fan speed is not possible! Please note that temperature pre-selection is not possible and the dehumidified room can cool dramatically!

"Timer" mode

Press the "TIMER ON" key to set the "switch-on time" and the "TIMER OFF" key to set the "switch-off" time for the unit.

Setting the "switch-on time"

1. ➤ Press the "TIMER ON" key. The remote control shows "TIMER ON", the last "switch-on time" setting and the symbol "H" appear on the display. The unit is now ready to reset the "switch-on time" and to start "TIMER ON" mode.
2. ➤ Press the "TIMER ON" key again to set the desired "switch-on time". Each time the key is pressed, the time is increased by half an hour between 0 and 10 hours, and by an hour between 10 and 24 hours.
3. ➤ Once these settings have been made, there is a one second delay before the remote control transmits the signal to the indoor unit. Then, after approx. two seconds, the "H" symbol disappears from the LCD display, and the set temperature appears again on the display.



Fig. 14: "Timer" mode

Setting the "switch-off time"

1. ➤ Press the "TIMER OFF" key. The remote control shows "TIMER OFF", the last "switch-off time" setting and the symbol "H" appear on the display. The unit is now ready to reset the "switch-off time" and to stop "TIMER OFF" mode.
2. ➤ Press the "TIMER OFF" key again to set the desired "switch-off time". Each time the key is pressed, the time is increased by half an hour between 0 and 10 hours, and by an hour between 10 and 24 hours.
3. ➤ Once these settings have been made, there is a one second delay before the remote control transmits the signal to the indoor unit. Then, after approx. two seconds, the "H" symbol disappears from the LCD display, and the set temperature appears again on the display.



- When Timer mode is selected, the remote control automatically transfers the timer signal to the indoor unit for the specified period of time. Therefore, you should hold the remote control in a location where it can transfer the signal to the indoor unit without interference.
- The effective operation for the time settings by the remote control for the timer function is restricted to the following settings:
0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24.

Example TIMER function settings

"TIMER ON" (Auto on mode)

Example:

You want the air conditioning unit to switch on 2 hours from the time it was programmed.

1. ➤ Press the "TIMER ON" key. The last operating time setting for the timer, and the "H" symbols, appear on the display.
2. ➤ Press the "TIMER ON" key until the desired start time is shown in the "TIMER ON" area on the remote control.
3. ➤ Wait for 3 seconds and the temperature appears again in this area of the digital display. The "TIMER ON" indicator stays lit, and this function is activated.

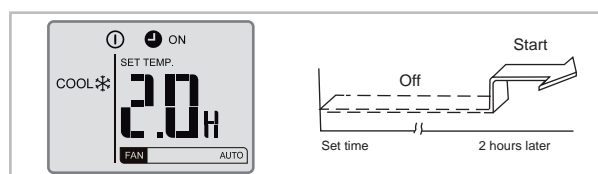


Fig. 15: "TIMER ON" example

"TIMER OFF" (Auto off mode)

Example:

You want the air conditioning unit to switch off 4 hours from the time it was programmed.

1. ➤ Press the "TIMER OFF" key. The last operating time setting for the timer, and the "H" symbols, appear on the display.
2. ➤ Press the "TIMER OFF" key until "10H" is shown in the "TIMER OFF" area on the remote control.
3. ➤ Wait for 3 seconds and the temperature appears again in this area of the digital display. The "TIMER OFF" indicator stays lit, and this function is activated.

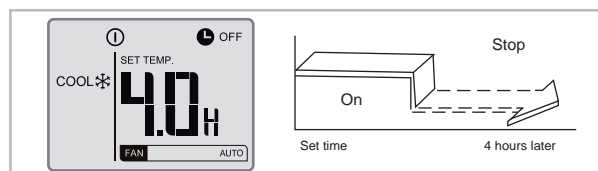


Fig. 16: "TIMER OFF" example

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Combined TIMER (setting "TIMER ON" and "TIMER OFF" at the same time)

"TIMER OFF" ⇨ "TIMER ON"

(On ⇨ Stop ⇨ Start)

Example:

You want the air conditioning unit to switch off in two hours from the time it was programmed, and switch back on ten hours later.

1. ➤ Press the "TIMER OFF" key.
2. ➤ Press the "TIMER OFF" key again until the desired stop time is shown in the "TIMER OFF" area on the remote control.
3. ➤ Press the "TIMER ON" key.
4. ➤ Press the "TIMER ON" key again until "10H" is shown in the "TIMER ON" area on the remote control.
5. ➤ Wait for 3 seconds and the temperature appears again in this area of the digital display. The "TIMER ON" and "TIMER OFF" indicators stay lit, and this function is activated.

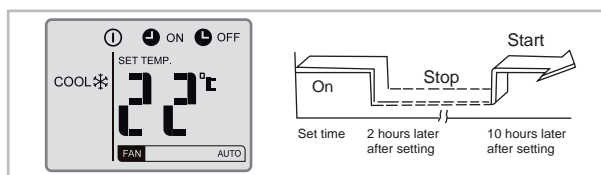


Fig. 17: "TIMER OFF" / "TIMER ON" example

"TIMER ON" ⇨ "TIMER OFF"

(Off ⇨ Start ⇨ Stop)

Example:

You want the air conditioning unit to switch on in two hours from the time it was programmed, and switch back off five hours later.

1. ➤ Press the "TIMER ON" key.
2. ➤ Press the "TIMER ON" key again until "2.0H" is shown in the "TIMER ON" area on the remote control.
3. ➤ Press the "TIMER OFF" key.
4. ➤ Press the "TIMER OFF" key again until "5.0H" is shown in the "TIMER OFF" area on the remote control.
5. ➤ Wait for 3 seconds and the temperature appears again in this area of the digital display. The "TIMER ON" and "TIMER OFF" indicators stay lit, and this function is activated.

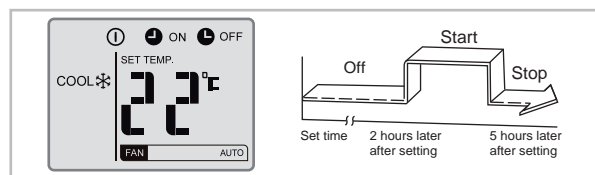


Fig. 18: "TIMER ON" / "TIMER OFF" example

5 Installation instructions for qualified personnel

5.1 Important notes prior to installation

- 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.
- Lift the unit on the corners and not on the refrigerant or condensate drainage connections.
- The refrigerant piping (injection and suction pipe), valves and connections must be insulated against vapour density. If necessary also insulate the condensate drainage line.
- 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.
- Only open the shut-off valves on the refrigerant piping after installation is complete.
- 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 refrigerant piping and ensures that the compressor oil can flow back without obstruction.
- Use the fastening materials provided in the scope of supply for the units. .
- Use four supports and the associated hooks to attach the ceiling cassette.
- Use the insulated condensate hose in the scope of delivery as a junction piece to the continuing condensate drain. Secure the condensate drain with the supplied clamps.

5.2 Wall openings

- A wall opening of at least 70mm diameter and 10mm incline from the inside to the outside must be created.
- To prevent damage to the lines, the interior of the wall opening should be padded or, for example, lined with PVC pipe (see figure).
- After installation has been completed, use a suitable sealing compound to close off the wall opening, taking account of fire protection regulations (responsibility of customer). Do not use cement or lime containing substances!

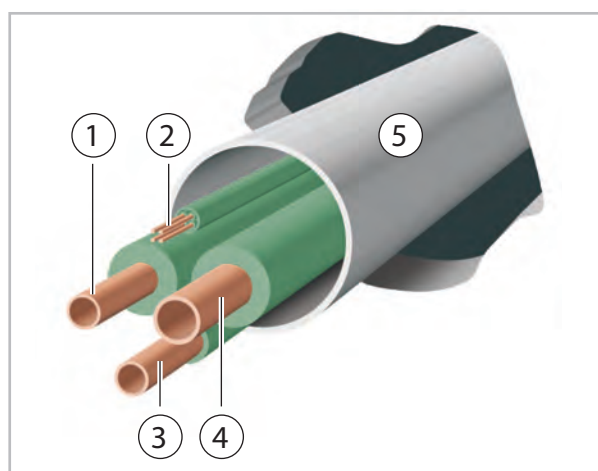


Fig. 19: Wall opening

- 1: Liquid line
- 2: Control line
- 3: Condensate drainage line
- 4: Suction pipe
- 5: PVC pipe

5.3 Installation materials

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

The outdoor unit is attached by 4 screws and a wall bracket to the wall or fixed by a floor bracket to the ground.

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5.4 Selection of installation location

Indoor unit

The indoor unit is designed for horizontal ceiling installation. The minimum distance from the floor should be 2 metres.

Outdoor unit

The outdoor unit is designed for horizontal installation on a base in outdoor areas. The installation site must be level, flat and firm. The unit should also be secured to prevent it from tipping over. The outdoor unit can be set up outside as well as inside a building. For external installation, please observe the following notes to protect the unit from the influence of the weather.

Rain

The unit should be at least 10 cm off the ground when mounted on the roof or ground. A floor bracket is available as an accessory.

Sun

The condenser on the outdoor unit emits heat. Exposure to sunlight further increases the temperature of the fins and reduces the heat released by the finned heat exchanger. The outdoor unit should be installed on to the north side of the building whenever possible. If necessary, take measures to provide sufficient shade (responsibility of customer). This could be a small roof. However, the discharging warm air flow must not be affected by the measures.

Wind

If the unit is being installed in windy areas, ensure that the warm outlet air is discharged in the prevailing wind direction. If this is not possible, it may be necessary to install a windbreak (to be provided by the customer). Ensure that the windbreak does not adversely affect the air intake to the unit. Additional stabilisation is recommended. This can be realised with wire ropes or other constructions.



Fig. 20: Windbreak

1: Wind

Snow

The unit should be wall-mounted in areas of heavy snowfall. Installation should be at least 20 cm above the expected level of snow to prevent snow from entering the outdoor unit. An optional wall bracket is available as an accessory.

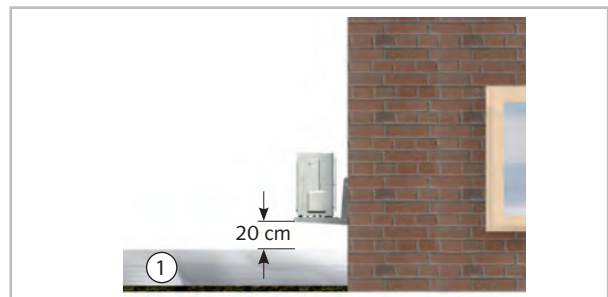


Fig. 21: Minimum clearance to snow

1: Snow

Installation inside buildings

- Ensure that heat can dissipate adequately when placing the outdoor unit in cellars, lofts, adjoining rooms or halls (Fig. 22).
- Install an additional fan with a rated flow comparative to that of the outdoor unit being installed in the room and which can compensate any additional pressure loss in ventilation ducts (Fig. 22).
- Comply with any regulations and conditions affecting the statics of the building. If necessary, fit acoustic installation.

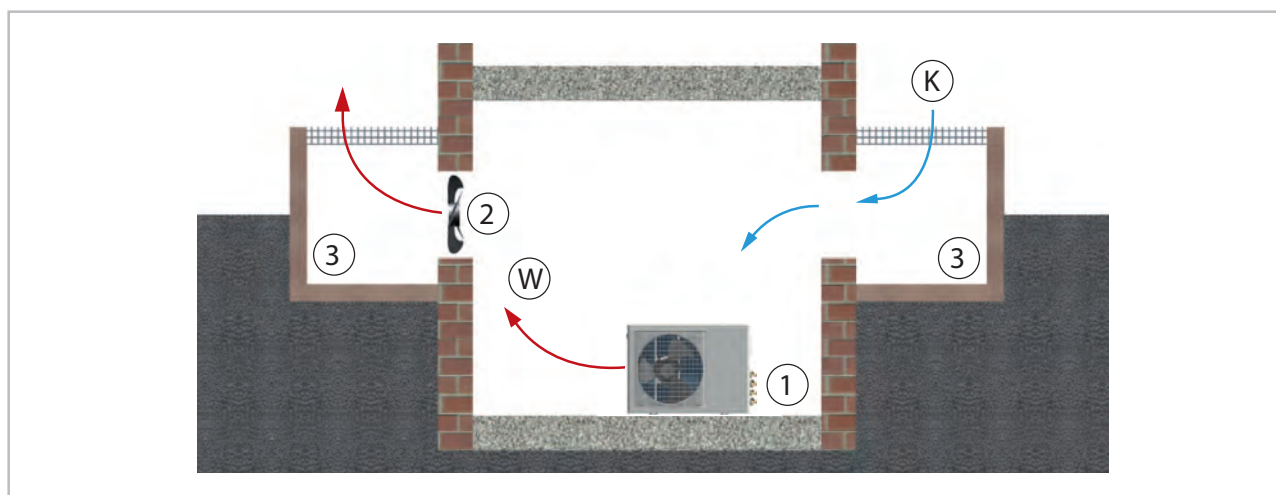


Fig. 22: Installation inside buildings

K: Cold fresh air
W: Warm air
1: Outdoor unit

2: Additional fan
3: Air shaft

5.5 Minimum clearances

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

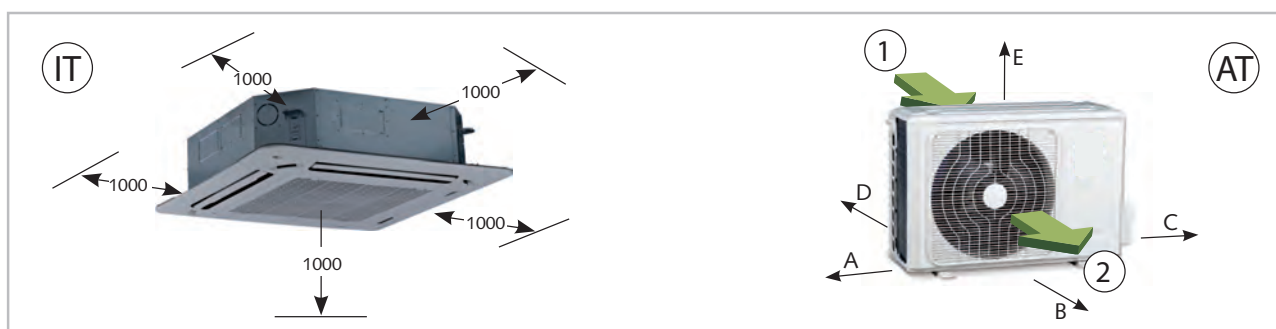


Fig. 23: Minimum clearances, indoor unit and outdoor unit (all measurements in mm)

AT: Outdoor unit / IT: Indoor unit

1: Air inlet / 2: Air outlet

	A	B	C	D	E
RVD 355-1055 DC	300	2000	600	300	600

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5.6 Oil return measures

If the outdoor unit is installed at a higher level than the indoor unit, suitable oil return measures must be taken. Usually, an oil pump bend is installed for every 7 metres of height difference.

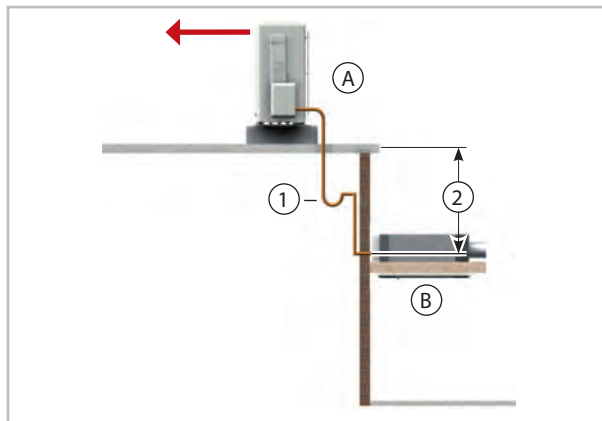


Fig. 24: Oil return measures

AT: Outdoor unit

IT: Indoor unit

1: 1 x oil pump bend in suction pipe to outdoor unit every 7 metres of height difference, radius: 50 mm

2: Max. 10-15 m

6 Installation

6.1 Unit installation

! NOTICE!

Installation should only be performed by authorised specialists.

The unit is mounted with the cover facing 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 (Fig. 25).
2. Fit the indoor unit onto the threaded rods and use the lower nuts to level the unit (Fig. 26).
3. Adhere to a ceiling clearance of at least 30 mm. Connect the refrigerant piping, electrical cables and condensate drainage line to the indoor unit as described below.
4. Check again that the unit is level.
5. The final task is to tighten the counternuts and attach the cover.

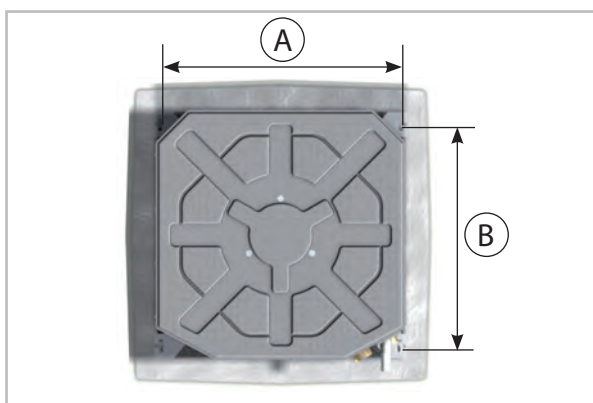


Fig. 25: Hooking in the unit

Indoor units (all dimensions in mm)	Measure- ment A	Measure- ment B
RVD 355-525 DC	545	523
RVD 685-1055 DC	780	680

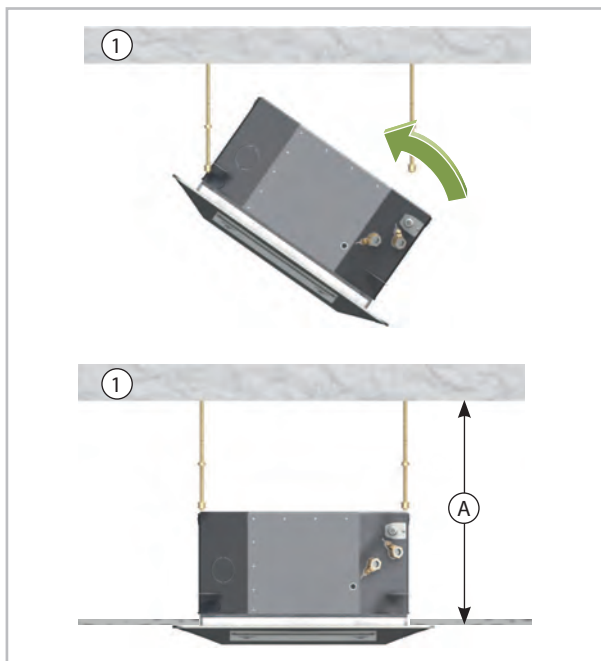


Fig. 26: Hooking in the unit

1: Structural component

	Distance A
RVD 355 DC IT	290 mm
RVD 525 DC IT	290 mm
RVD 685 DC IT	275 mm
RVD 1055 DC IT	275 mm

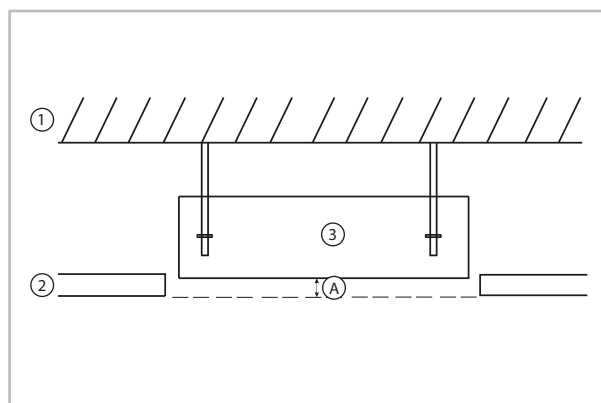


Fig. 27: Fastening the unit

A: Distance A
1: Ceiling
2: Suspended ceiling
3: Unit housing

Indoor units	Distance A	Suspended unit
RVD 355-525 DC IT	23 mm	545x523 mm
RVD 685-1055 DC IT	10-18 mm	780x680 mm

Fresh air connection

The unit is prepared for the intake of fresh air.



Fig. 28: Fresh air connection

1: Fresh air connection

! NOTICE!

Only use one fresh air connection

! NOTICE!

The unit is factory filled with dry nitrogen for leak testing purposes. The pressurised nitrogen is released when the union nuts are undone.

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 65 mm to the fresh air connection (Fig. 29).

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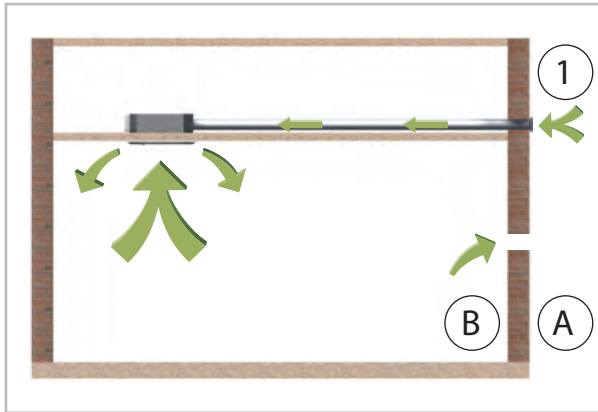


Fig. 29: Fresh air connection

- 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.

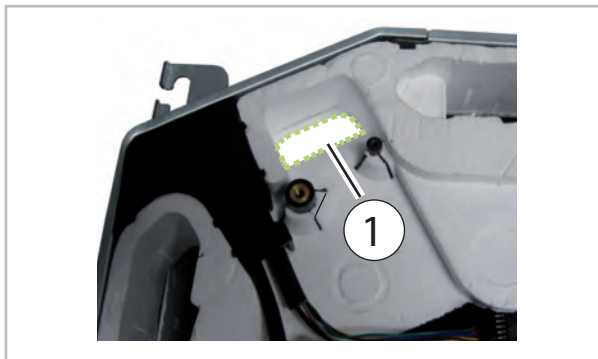


Fig. 30: Fresh air inlet

- 1: Fresh air inlet

6.2 Connection of refrigerant piping

The refrigerant piping connection provided by the customer takes place on one corner of the unit, inside the suspended ceiling. Once installed, the connections should be insulated to make them vapour diffusion proof.

! NOTICE!

Use only tools which are approved for use in an HVAC environment. (z. B.: bending pliers, pipe/tubing cutters, de-burrers and flaring tools). Do not cut refrigerant pipes with a saw.

! NOTICE!

All work must be carried out in a way that prevents dirt, particles, water etc. from entering, refrigerant lines!

! NOTICE!

A detachable connection may only be established outside the room. To connect the indoor units, use only the supplied, non-detachable union nuts or provide a firm connection.

Connection of the unit panel

The unit panel is bolted onto the ceiling cassette with the 4 screws supplied. Connect the connection cables between the unit panel and ceiling cassette together. When doing so, note that the connection cable of the swing motors must be connected directly to the control board of the ceiling cassette at contact CN14 (swing). A cable with connecting plug may have been plugged in at the factory. This must be removed for installation.

The following instructions describe the installation of the cooling cycle and the assembly of the indoor unit and the outdoor unit:

1. ➤ The required pipe diameters are given in the table "Technical data".
2. ➤ Install the indoor unit and connect the refrigerant piping as described in the operating manual for the indoor unit.
3. ➤ Use the wall or floor brackets to fit the outdoor unit against structural parts approved to support the static load (refer to the installation instructions for the brackets).
4. ➤ Ensure that structure-borne sound is not transferred to parts of the building. Use vibration dampers to reduce the effects of structure-borne sound!
5. ➤ Lay the refrigerant piping from the indoor unit to the outdoor unit. Ensure that the fastenings are adequate and if necessary, take appropriate oil return measures!
6. ➤ Remove the factory-fitted protective caps and union nuts on the connections. These should be used later in the installation process.
7. ➤ Before flanging the refrigerant piping, ensure that the union nut is fitted on the pipe.
8. ➤ Prepare the laid refrigerant piping as shown below (Fig. 31 and Fig. 32).
9. ➤ Verify that the shape of the flange is correct (Fig. 33).
10. ➤ First connect and hand-tighten the refrigerant piping to ensure it is correctly seated.
11. ➤ Then tighten the fittings with 2 appropriately-sized open-ended spanners. Use a spanner to counter the force when tightening the fitting (Fig. 34).
12. ➤ Use insulation hoses which are designed for this temperature range and are diffusion proof.
13. ➤ Observe the permitted bending radius for the refrigerant piping during installation. Never bend a pipe twice in the same place. Brittleness and cracking can result.
14. ➤ Apply appropriate heat insulation to the installed refrigerant piping, including connector.
15. ➤ Take the same action at the shut-off valves for all subsequent refrigerant piping.

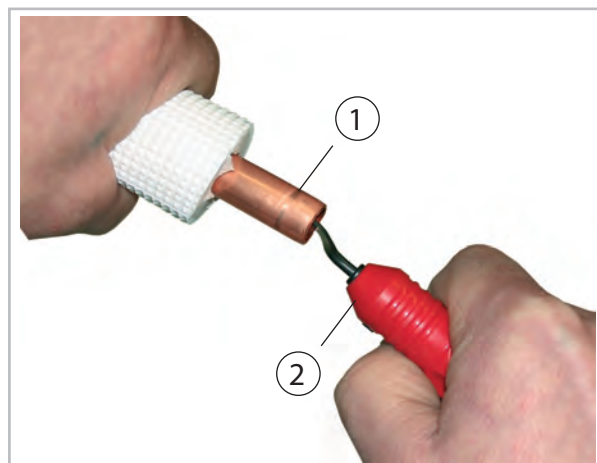


Fig. 31: Deburring the refrigerant piping

1: Refrigerant piping / 2: Deburrer

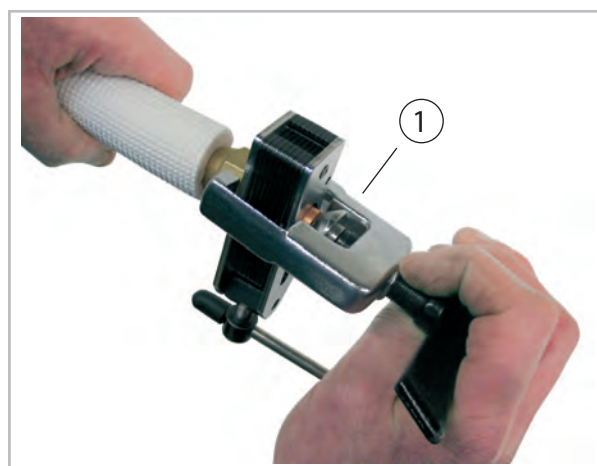


Fig. 32: Flanging the refrigerant piping

1: Flanging tool

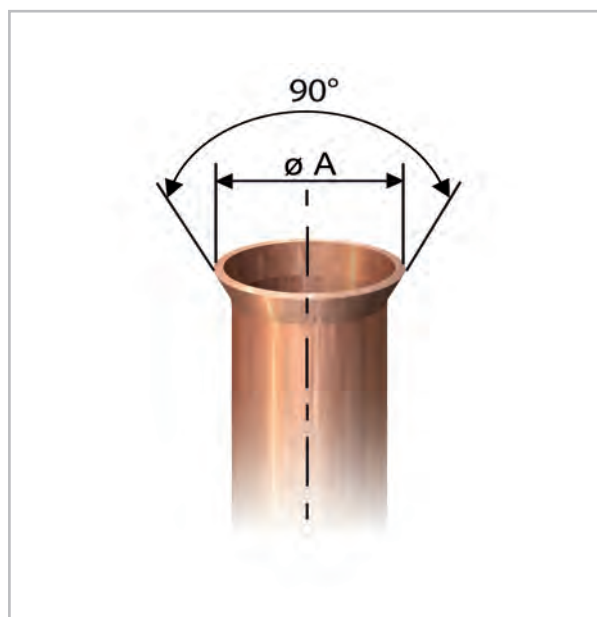


Fig. 33: Correct flange shape

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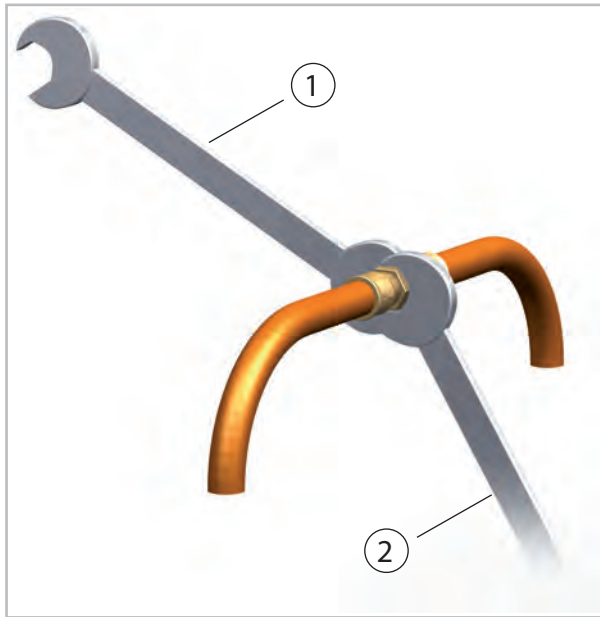


Fig. 34: Tightening the fitting

- 1: Tighten with the first open-ended spanner
- 2: Counter with the second open-ended spanner

Pipe dimension in inches	Tightening torque in Nm
1/4"	15-20
3/8"	33-40
1/2"	50-60
5/8"	65-75
3/4"	95-105

6.3 Leak testing

Once all the connections have been established, the pressure gauge station is attached to the corresponding Schrader valve connection as follows:

blue = large valve = suction pressure

Once the connection has been made successfully, the leak test is carried out with dry nitrogen.

Leak testing involves spraying a leak detection spray onto the connections. If bubbles are visible, the connections have not been made properly. In that case, tighten the connection or, if necessary, create a new flange.

After completing a successful leak test, the excess pressure in the refrigerant piping is removed and a vacuum pump with an absolute final partial pressure of min. 10 mbar is used to remove all of the air and empty the pipes. Any moisture present in the pipes will also be removed.

! NOTICE!

A vacuum of at least 20 mbar must be produced!

The time required to generate the vacuum is dependent on the final pressure pipe volume of the indoor units and the length of the refrigerant piping. However, the process will take at least **60 minutes**. Once any foreign gases and humidity have been completely extracted from the system, the valves on the pressure gauge station are closed and the valves on the outdoor unit are opened as described in the "Commissioning" section.

6.4 Adding refrigerant

The units contain a basic quantity of refrigerant. In addition, an additional amount of refrigerant must be added for refrigerant piping lengths exceeding 5 metres per circuit. Refer to the following chart:

	Up to and incl. 5m	From 5m to max. length
RVD 355 DC	0 g/m	15 g/m
RVD 525 DC		
RVD 685 DC		30 g/m
RVD 1055 DC		

CAUTION!

Wear protective clothing when handling refrigerant.

DANGER!

Only refrigerant in a liquid state may be used to fill the cooling cycle!

NOTICE!

Check the overheating to determine the refrigerant fill quantity.

NOTICE!

The escape of refrigerant contributes to climatic change. In the event of escape, refrigerant with a low greenhouse potential has a lesser impact on global warming than those with a high greenhouse potential.

This unit contains refrigerant with a greenhouse potential of 675. That means the escape of 1 kg of this refrigerant has an effect on global warming that is 675 times greater than 1 kg CO₂, based on 100 years. Do not conduct any work on the refrigerant circuit or dismantle the unit - always enlist the help of qualified experts.

7 Condensate drainage connection and safe drainage

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 4 °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.

Safe drainage in the event of leakages

Local regulations or environmental laws, for example the German Water Resource Act (WHG), can require suitable precautions to protect against uncontrolled drainage in case of leakage to provide for safe disposal of escaping air conditioning fluid or hazardous media.

NOTICE!

The max. pump pressure of the condensate pump is 500/750 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 450/700 mm!

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! NOTICE!

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

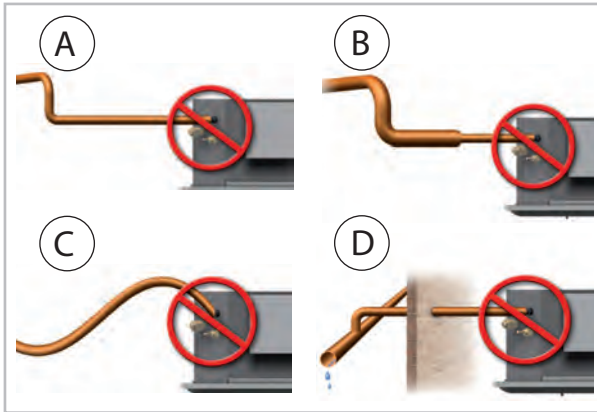


Fig. 35: Condensate drainage connection - incorrect!

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

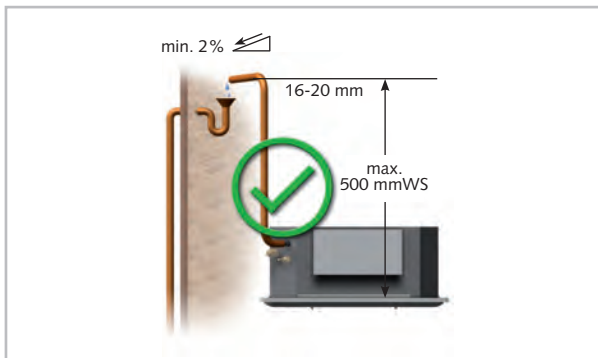


Fig. 36: Condensate drainage connection - correct!

8 Electrical wiring

8.1 General connection and safety instructions

A protected power supply cable is to be connected to the outdoor unit and a four-core control line with a minimum cross-section of 1.5mm². To avoid EMC interference, only use shielded cable for this purpose and connect the shielding on both sides.



DANGER!

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



NOTICE!

The electrical connection for the units must be made at a separate feedpoint with a residual current device in accordance with local regulations and should be laid out by an electrician.



We recommend using shielded wires for the control lines.

- We recommend that a mains/repair switch be installed near the outdoor unit.
- The terminal blocks for establishing the connections are located on the side of the unit. When the unit is installed, measurements can be made from the front by removing the cover.
- If an optional condensate pump is used as an accessory in conjunction with the unit, it may be necessary to install an additional relay with a higher contact rating after the switch-off contact on the pump to switch off the compressor.
- The control lines used should comprise shielded wire, if laid in areas exposed to strong magnetic fields.
- Details concerning the electrical protection of the system are provided in the technical data.

8.2 Connecting the indoor unit

Make the connection as follows:

1. ➤ Open the air inlet grill.
2. ➤ Loosen the switch cabinet's cover (Fig. 38).
3. ➤ Feed the voltage-free cable through the edge protection rings on the control box and clamp the cable in the strain relief.
4. ➤ Then connect the cable in accordance with the wiring diagram (see chapter "Electrical wiring diagram").
5. ➤ Connect the electrical plugs on the cover to the mating connectors on the cassette. It is not possible to incorrectly connect these.
6. ➤ Re-install all disassembled parts.



Fig. 37: Switch cabinet access

REMKO RVD series

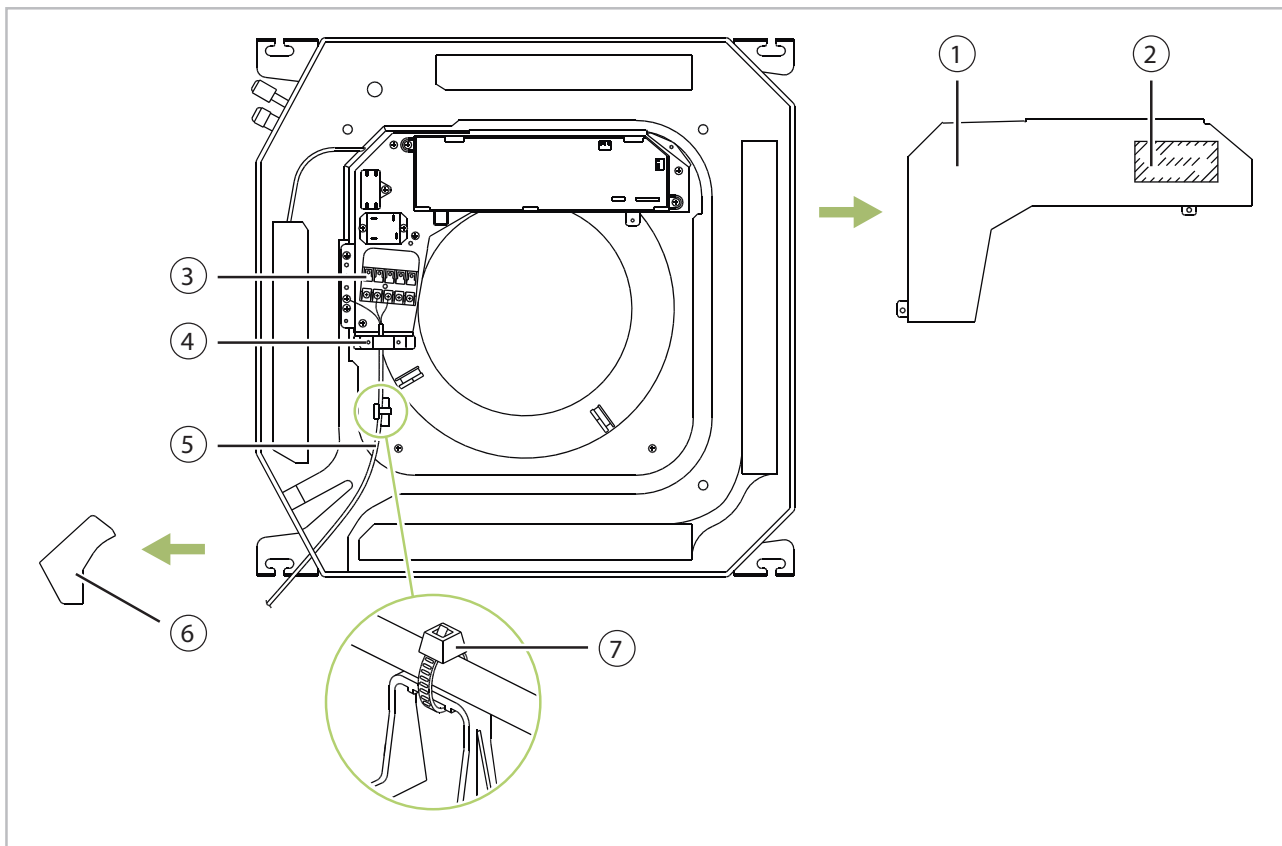


Fig. 38: Connecting the indoor unit

- | | |
|--------------------------------------|---------------------------------------|
| 1: Plastic cover | 5: Communication line to outdoor unit |
| 2: Electrical drawing | 6: Plastic cover |
| 3: Power supply connection terminals | 7: Cable fastening possibility |
| 4: Strain relief | |



Check all plugged and clamped terminals to verify that they are seated correctly and make permanent contact. Tighten as required.

8.3 Outdoor unit connection

Proceed as follows to connect the line:

1. ➤ Remove the unit cover.
2. ➤ Remove the side panel at the connection.
3. ➤ Choose the cable cross-section in accordance with the relevant specifications.
4. ➤ Feed both cables through the edge protection rings on the fixed connection panel.
5. ➤ Connect the lines as shown on the electrical connection diagram.
6. ➤ Fix the line in the strain relief and re-assemble the unit.

8.4 Electrical wiring diagram

Connection RVD 355 DC

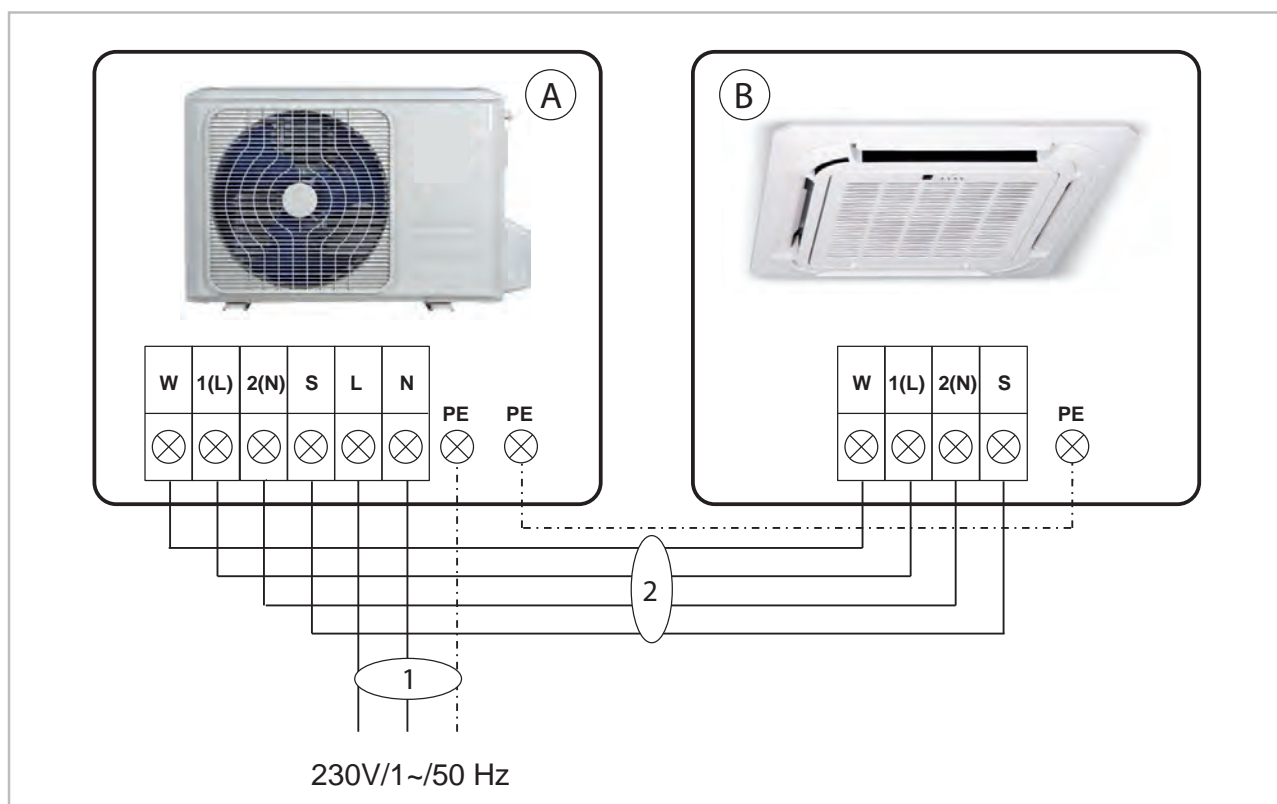


Fig. 39: Electrical wiring diagram RVD 355 DC

A: Outdoor unit RVD 355 DC AT
B: Indoor unit RVD 355 DC IT

1 Power supply
2: Communication lines

REMKO RVD series

Connection RVD 525 DC

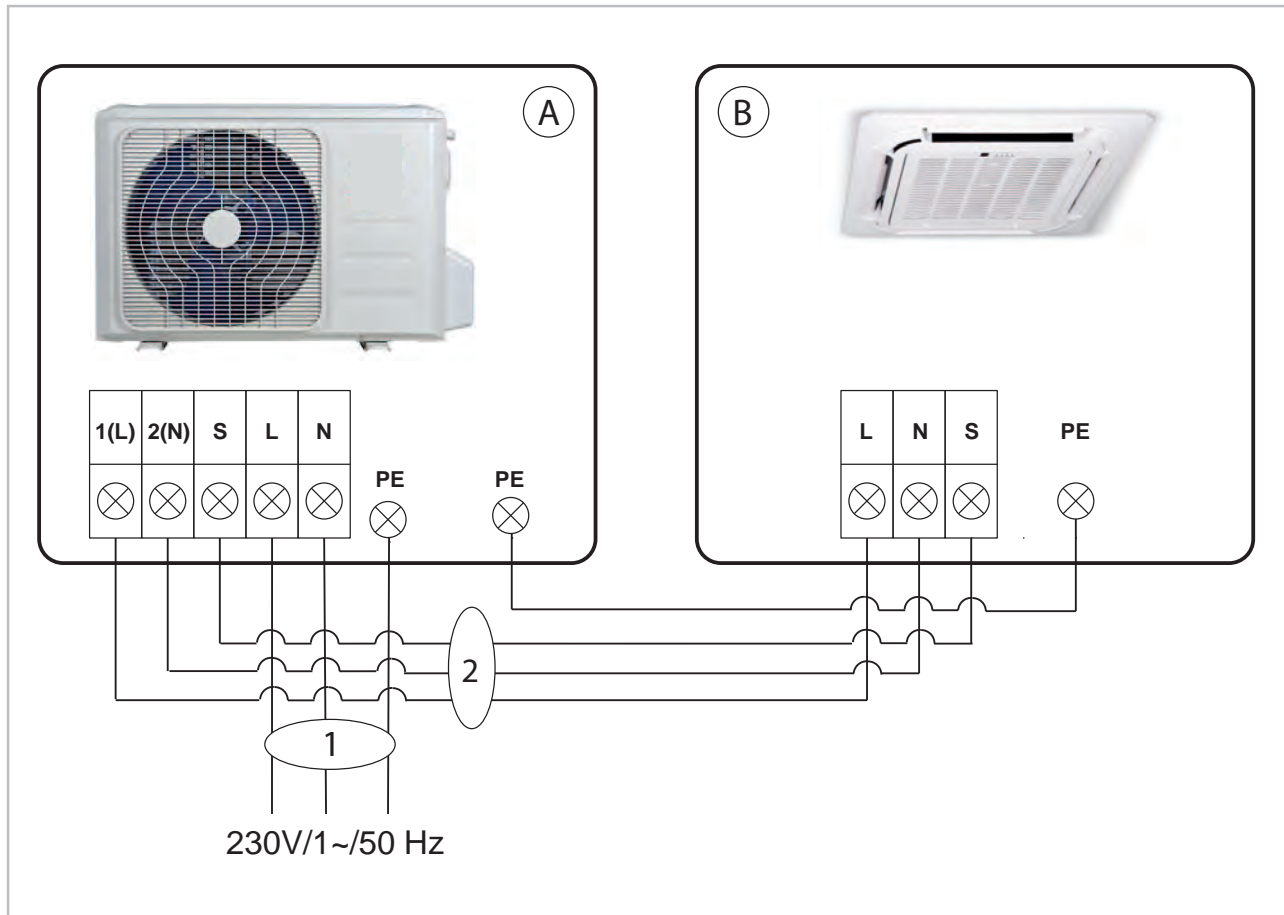


Fig. 40: Electrical wiring diagram RVD 525 DC

A: Outdoor unit RVD 525 DC AT
B: Indoor unit RVD 525 DC IT

1 Power supply
2: Communication lines

Connection RVD 685 DC

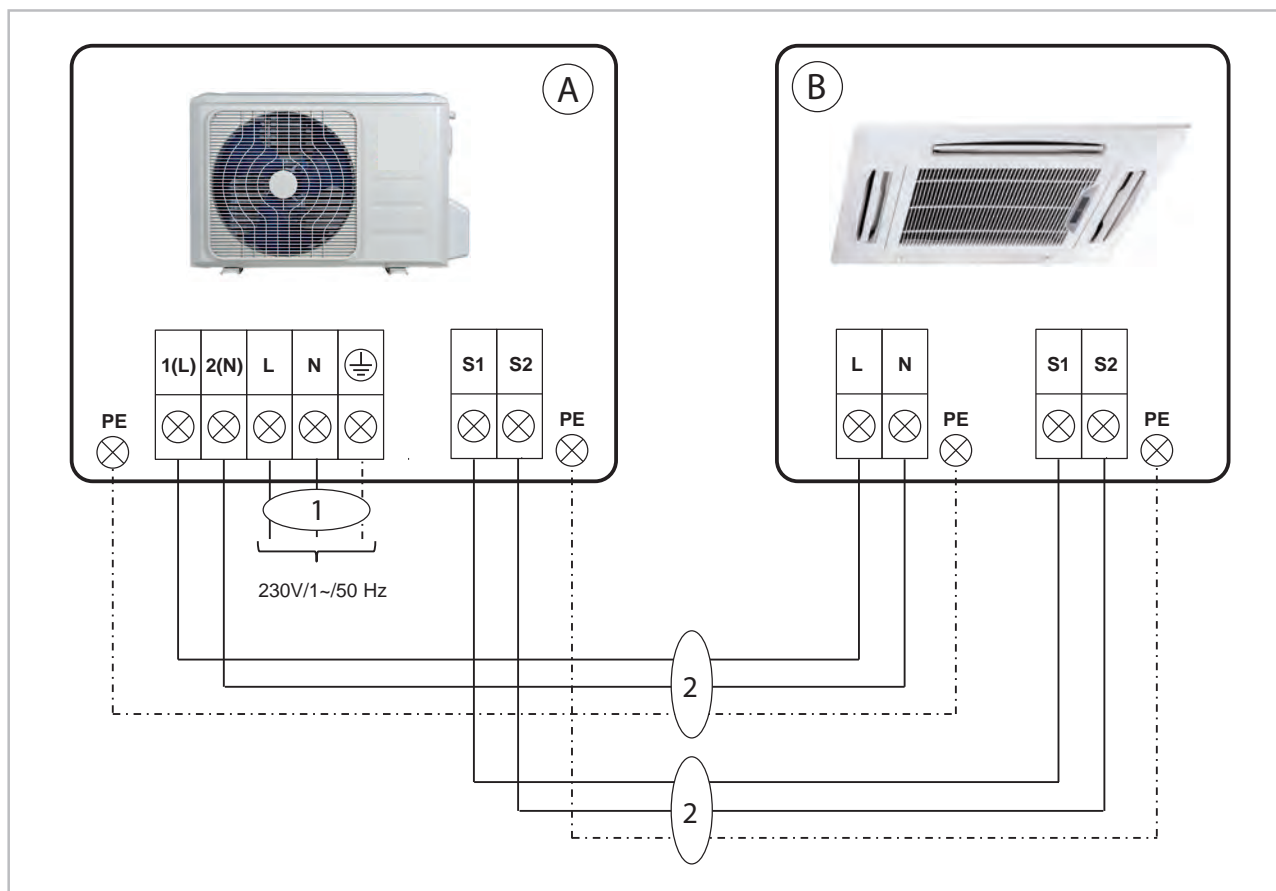


Fig. 41: Electrical wiring diagram RVD 685 DC

A: Outdoor unit RVD 685 DC AT
B: Indoor unit RVD 685 DC IT

1 Power supply
2: Communication lines

REMKO RVD series

Connection RVD 1055 DC

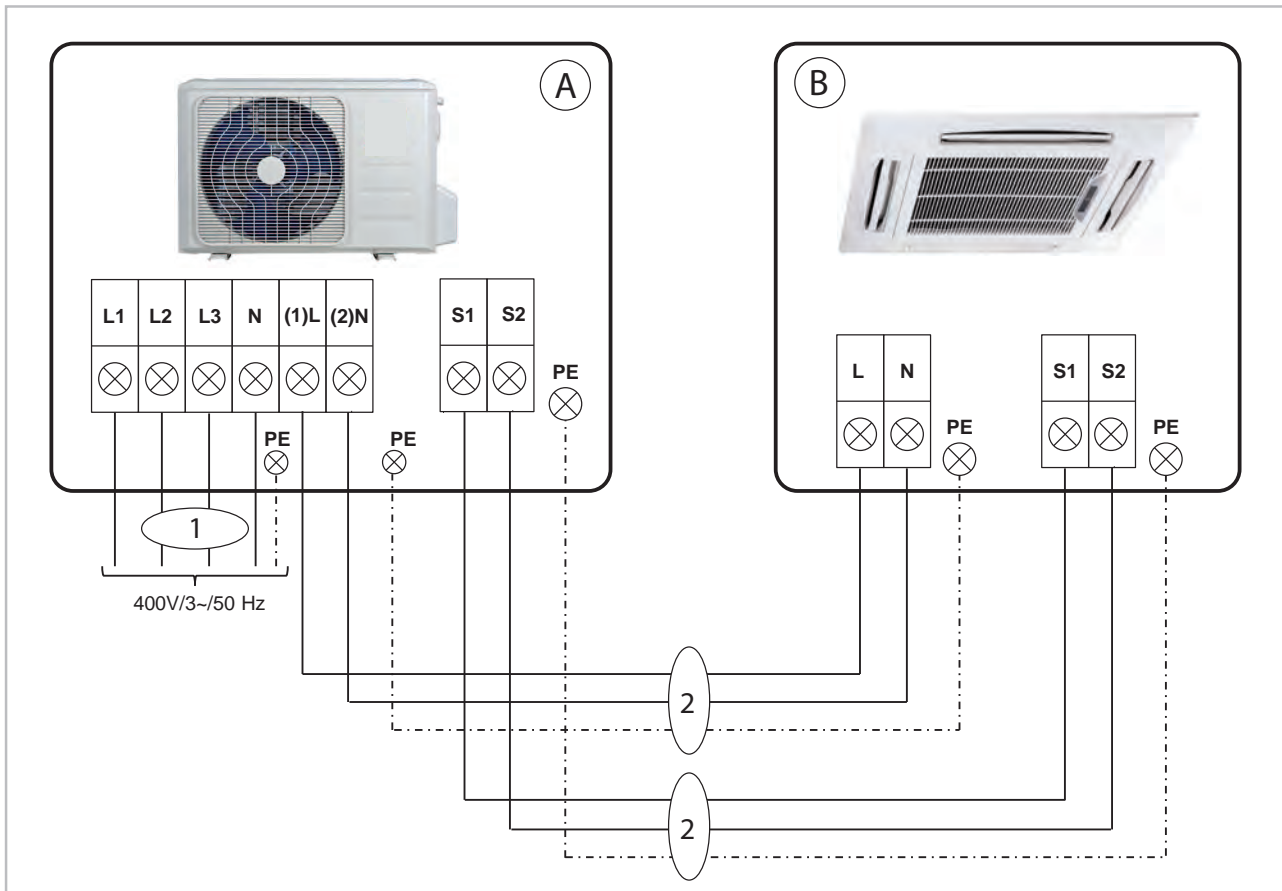


Fig. 42: Electrical wiring diagram RVD 1055 DC

A: Outdoor unit RVD 1055 DC AT
B: Indoor unit RVD 1055 DC IT

1 Power supply
2: Communication lines

8.5 Electrical drawings

Indoor unit RVD 355 DC IT

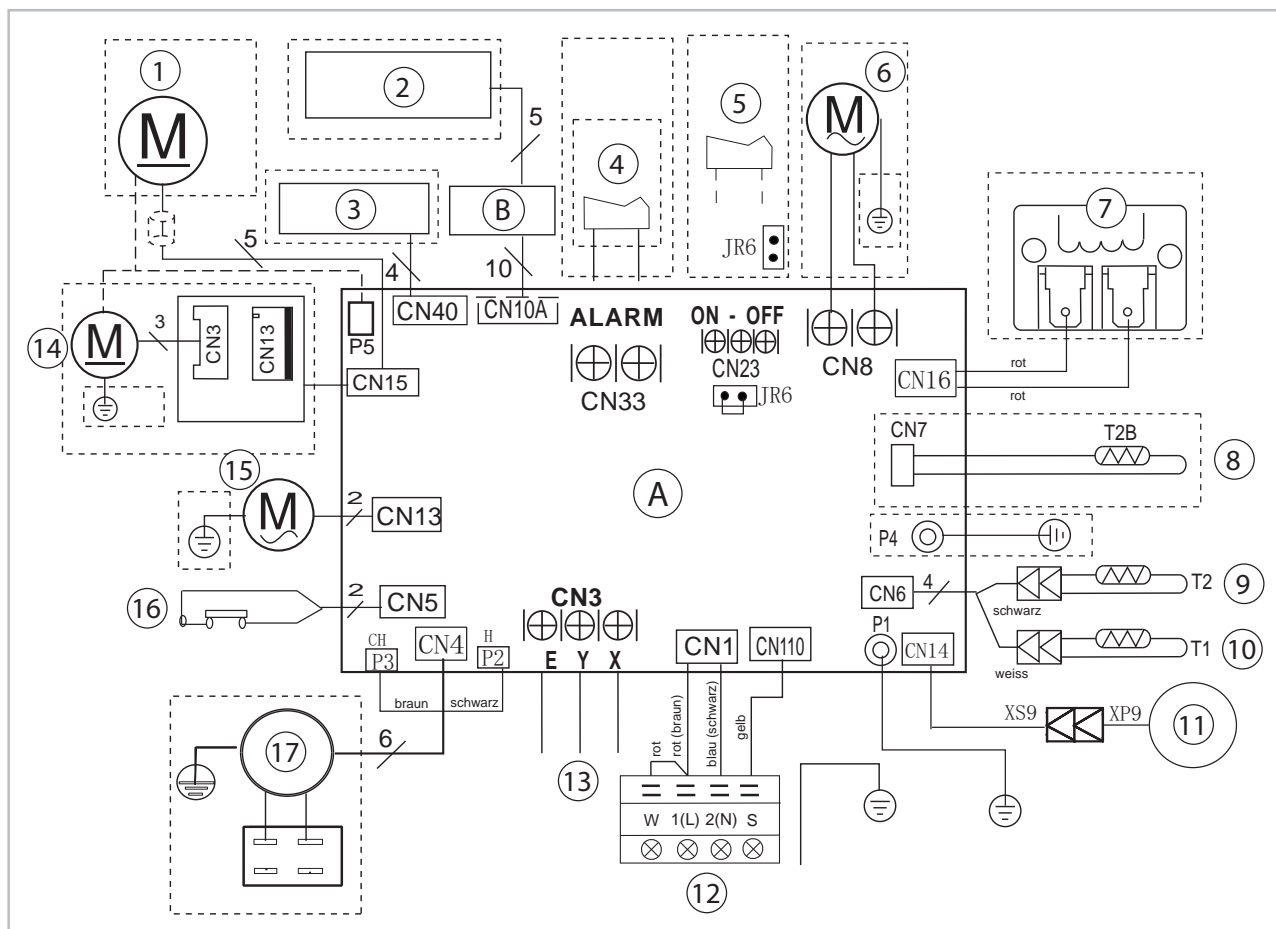






Fig. 43: Electrical drawings RVD 355 DC IT

- | | |
|--|---|
| A: Control board | 8: Temperature probe, suction pipe |
| B: Display circuit board | 9: Temperature probe, evaporator |
| 1: DC fan motor (alternative) | 10: Temperature probe, indoor air |
| 2: Optional wired remote control | 11: Swing motor |
| 3: Connection of optional wired remote control | 12: Connecting line to the outdoor unit |
| 4: Potential-free alarm contact | 13: MCC-1 controller connection |
| 5: External on/off | 14: DC fan motor |
| 6: Connection possibility for fan motor provided by the customer | 15: Condensate pump |
| 7: Transformer | 16: Condensate pump liquid level switch |
| | 17: AC fan motor |





REMKO RVD series

DIP switch setting possibilities



Address assignment MCC-1 (S2+S1)

Switch		
S2 + S1		
Address	0~15	16~31
Factory setting	✓	
S2 + S1		
Address	32~47	48~63
Factory setting		



Anti-cold air function (SW1)

Switch	SW1	Factory setting
	Fan motor stop temperature	
	24	✓
	15	
	8	
	After EEPROM programming	





Fan behaviour without demand (SW2)

Switch	SW2	Value	Factory setting
ON		Fan OFF	✓
Setting		Fan ON	





Automatic restart after power failure (SW3)

Switch	SW3	Value	Factory setting
ON		Automatic restart in last operating mode	✓
Setting		No automatic restart	

Mode priority (SW5)

Switch	SW5			
ON				
Setting				
Value	Heating	Heating	Cooling	Cooling
Factory setting	✓			





Temperature compensation (SW6)

Switch	SW6			
ON				
Setting				
Value	6	4	2	
Factory setting	✓			





REMKO RVD series

DIP switch setting possibilities



Address assignment MCC-1 (S2+S1)

Switch		
S2 + S1		
Address	0~15	16~31
Factory setting	✓	
S2 + S1		
Address	32~47	48~63
Factory setting		



Anti-cold air function (SW1)

Switch	SW1	Factory setting
	Fan motor stop temperature	
	24	✓
	15	
	8	
	After EEPROM programming	





Fan behaviour without demand (SW2)

Switch	SW2	Value	Factory setting
ON Setting		Fan OFF	✓
		Fan ON	





Automatic restart after power failure (SW3)

Switch	SW3	Value	Factory setting
ON Setting		Automatic restart in last operating mode	✓
		No automatic restart	

Main / slave setting (SW5)

Switch	SW5			
ON Setting				
Value	MAIN NO SLAVE	MAIN	MAIN	SLAVE
Factory setting	✓			

Temperature compensation (SW6)

Switch	SW6			
ON Setting				
Value	6	4	2	
Factory setting	✓			

Power setting (ENC1)

ENC1			
Switch no.	Power [W]	Switch no.	Power [W]
4	4000-5300	8	9100-10500
5	5400-7100	9	12000-14000
6	-	A	14500-16000
7	7500-9000		

Outdoor unit RVD 355 DC AT

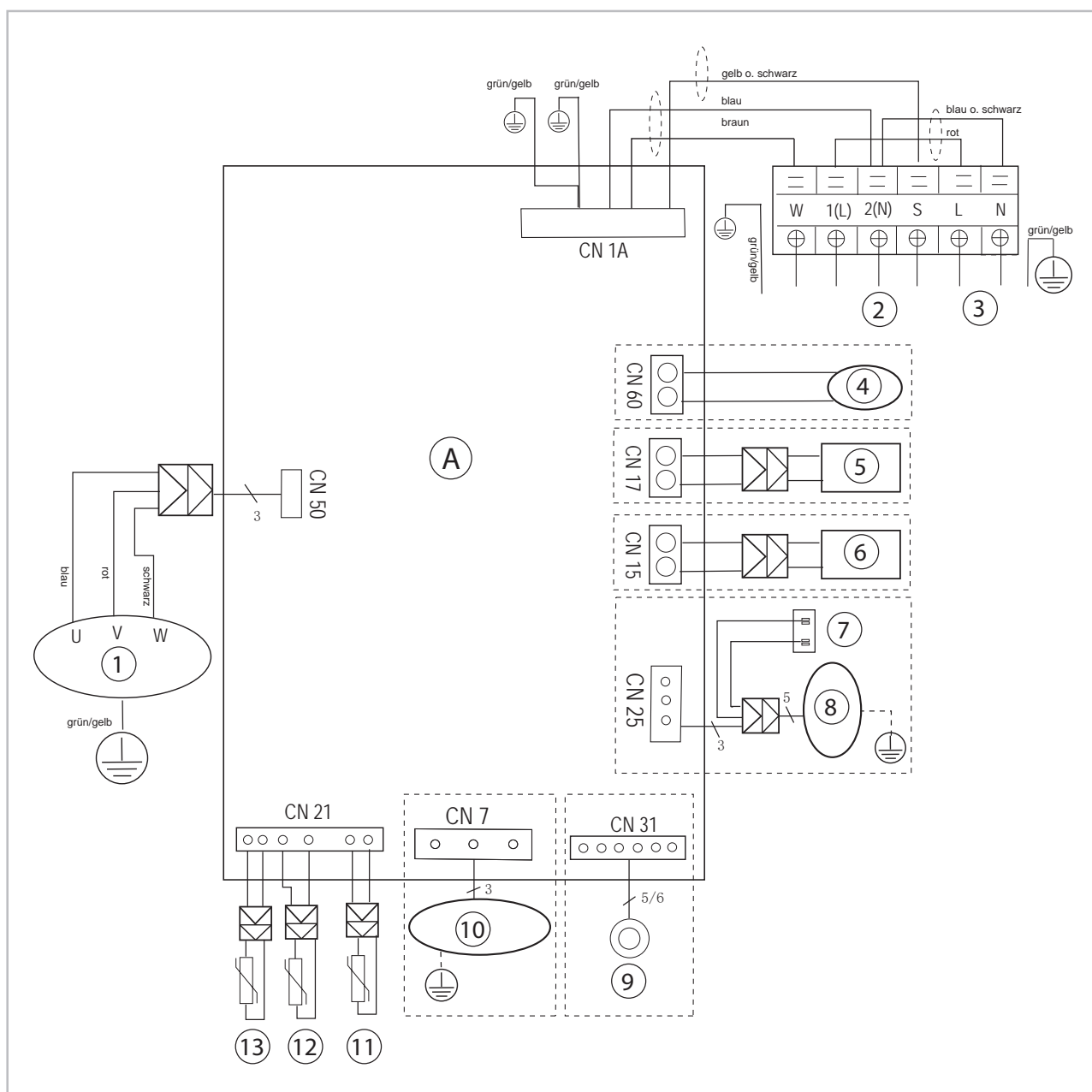


Fig. 45: Electrical drawings RVD 355 DC AT

- | | |
|----------------------------|--|
| A: Control board | 7: Condenser |
| 1: Compressor | 8: AC fan motor |
| 2: To indoor unit | 9: Electronic E-valve |
| 3: Power supply | 10: DC fan motor |
| 4: 4-way reversing valve | 11: Air inlet temperature probe |
| 5: Crankcase heating | 12: Temperature probe for condenser outlet |
| 6: Condensate tray heating | 13: Temperature probe for heat gas line |

REMKO RVD series

Outdoor unit RVD 525 DC AT

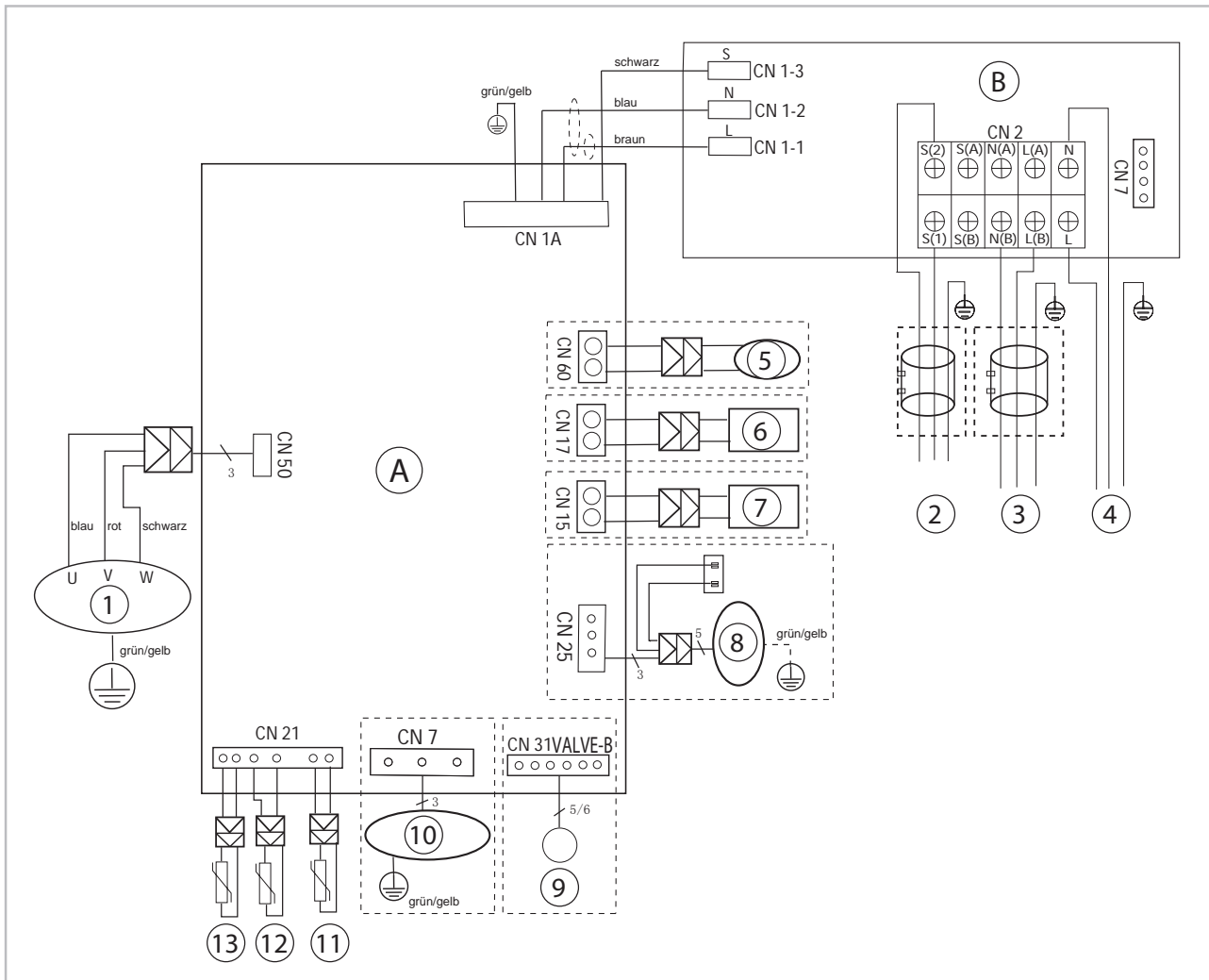


Fig. 46: Electrical drawings RVD 525 DC AT

- | | |
|--------------------------------------|--|
| A: Control board | 7: Condensate tray heating |
| B: Auxiliary circuit board | 8: AC fan motor |
| 1: Compressor | 9: Electronic E-valve |
| 2: Communication line to indoor unit | 10: DC fan motor |
| 3: Supply line to indoor unit | 11: Air inlet temperature probe |
| 4: Power supply | 12: Temperature probe for condenser outlet |
| 5: 4-way reversing valve | 13: Temperature probe for heat gas line |
| 6: Crankcase heating | |

Outdoor unit RVD 685 DC AT

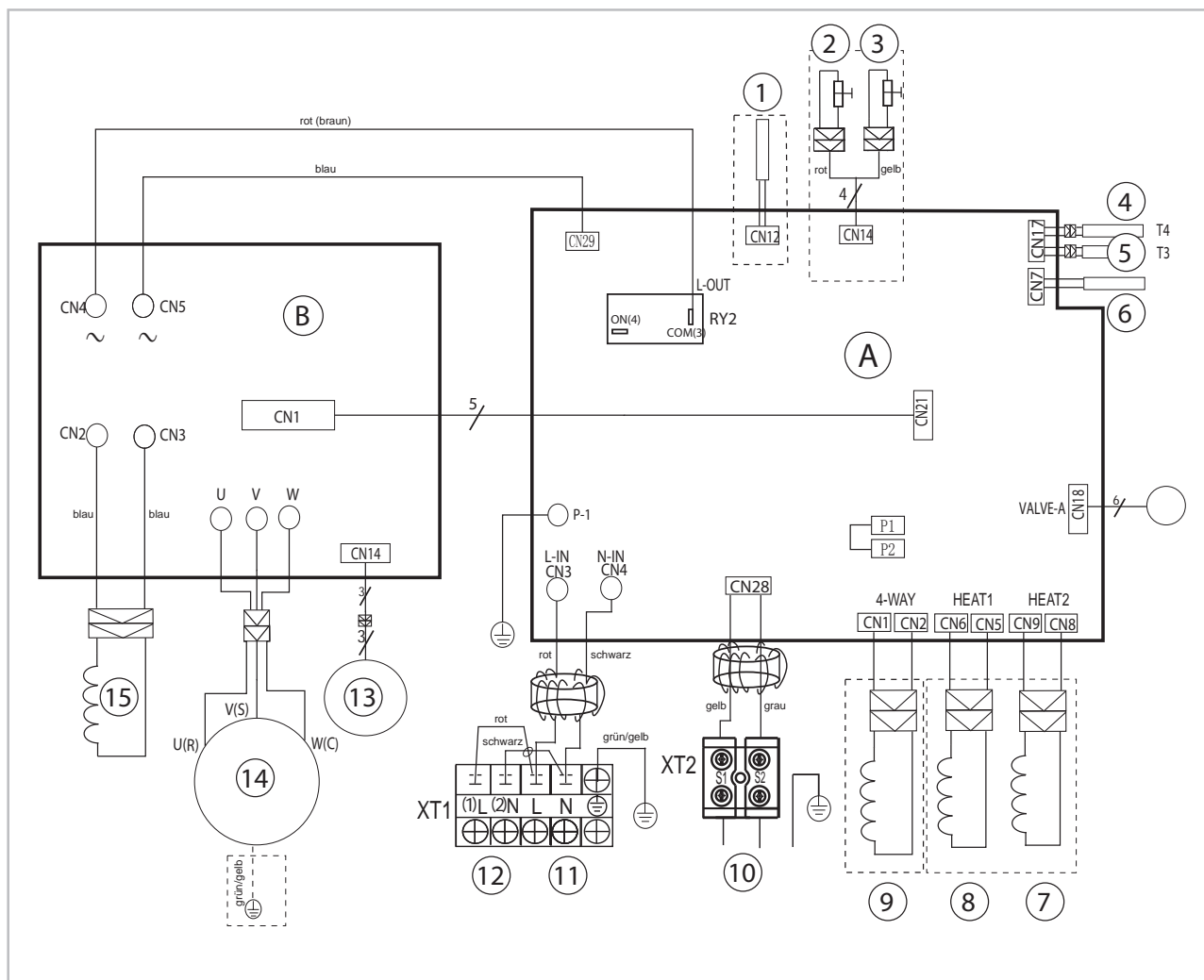


Fig. 47: Electrical drawings RVD 685 DC AT

- | | |
|---|---------------------------------------|
| A: Control board | 8: Crankcase heating |
| B: Inverter board | 9: 4-way reversing valve |
| 1: Klixon | 10: Communication line to indoor unit |
| 2: Low pressure switch | 11: Power supply |
| 3: High pressure switch | 12: Supply line to indoor unit |
| 4: Air inlet temperature probe | 13: DC fan motor |
| 5: Temperature probe for condenser outlet | 14: Compressor |
| 6: Temperature probe for heat gas line | 15: Transformer |
| 7: Condensate tray heating | |

REMKO RVD series

Outdoor unit RVD 1055 DC AT

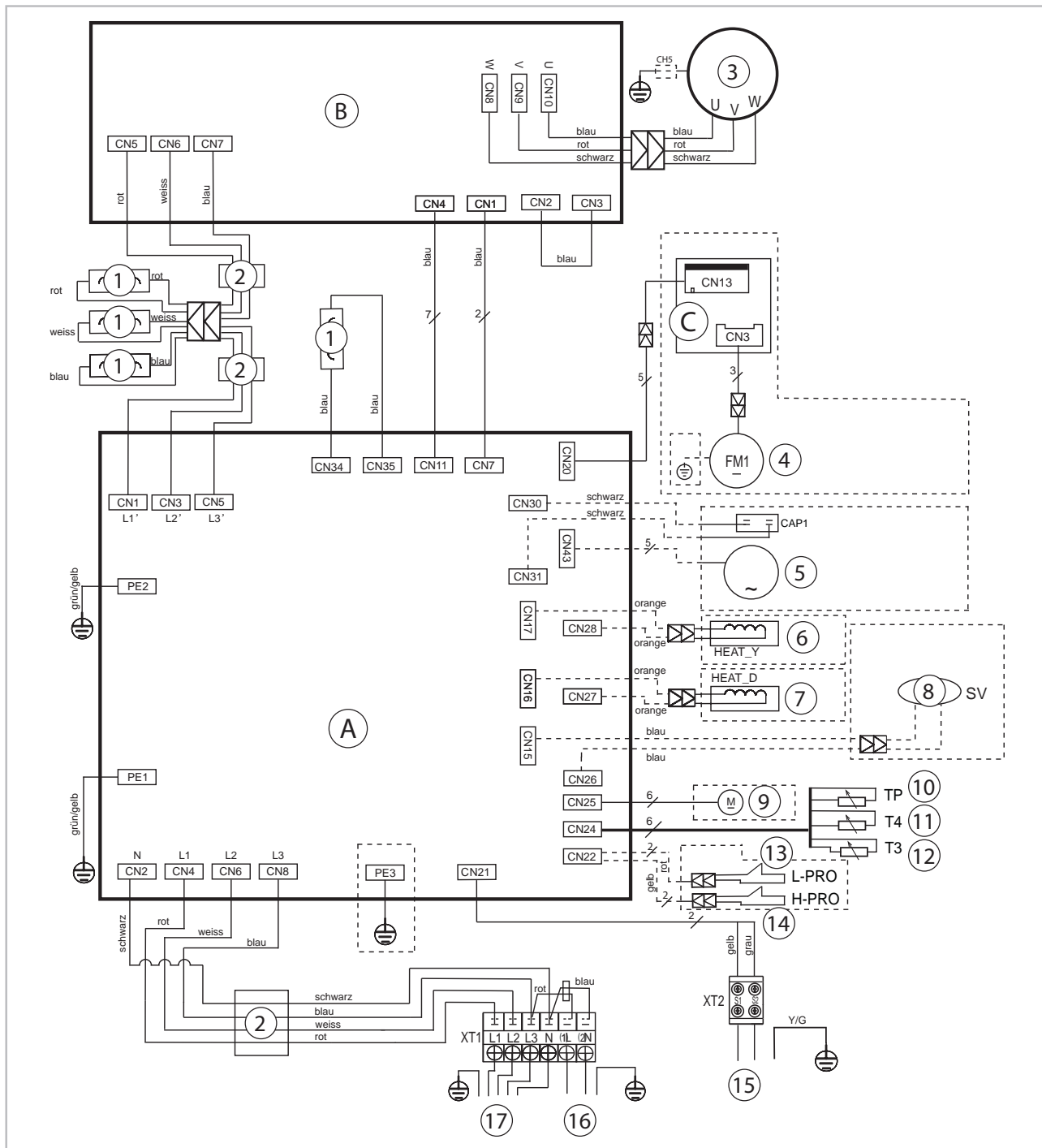


Fig. 48: Electrical drawings RVD 1055 DC AT

- | | |
|-------------------------------|--|
| A: Control board | 8: 4-way reversing valve |
| B: Inverter board | 9: Electronic E-valve |
| C: Control board DC fan motor | 10: Temperature probe for heat gas line |
| 1: Transformer | 11: Temperature probe for condenser outlet |
| 2: Magnetic ring | 12: Air inlet temperature probe |
| 3: Compressor | 13: Low pressure switch |
| 4: DC fan motor | 14: High pressure switch |
| 5: AC fan motor | 15: Communication line to indoor unit |
| 6: Crankcase heating | 16: Supply line to indoor unit |
| 7: Condensate tray heating | 17: Power supply |

8.6 Connection of a superordinate controller provided by the customer

Units of type RVD can be switched on and off by a superordinate controller. In order to utilise the potential-free contact for externally switching the unit on and off, it is first necessary to remove the jumper (JR6) at the indoor unit control board. The contacts are then available.

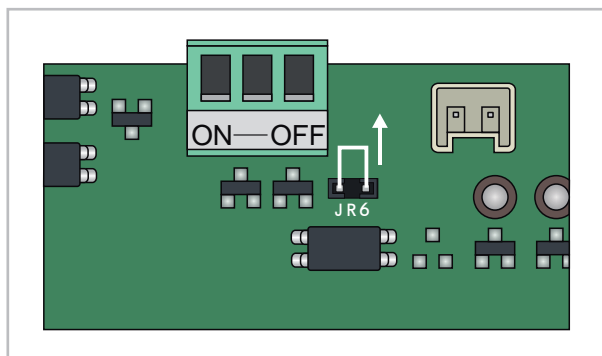


Fig. 49: Removing the jumper

The building controller is now connected via the two outer contacts of the plug labelled ON - OFF. If the connection between the two contacts is open, the system is in stand-by mode. The "Operation LED" and the "Timer LED" blink alternately. The unit can no longer be switched on using the remote control.

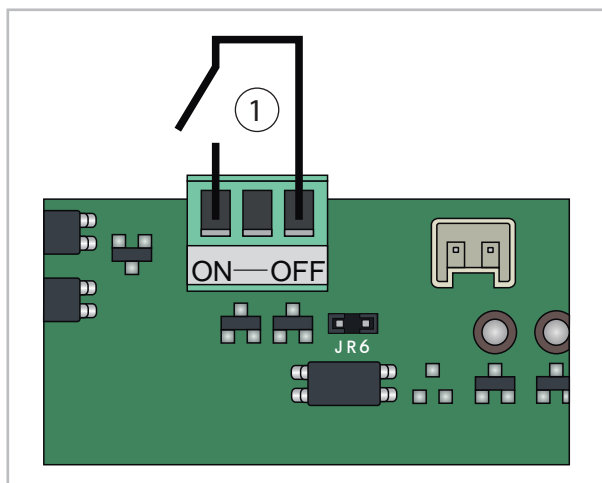


Fig. 50: Open contact

1: Stand-By

If the connection between the two contacts is closed, the unit is reactivated and switches to the last operating mode used.

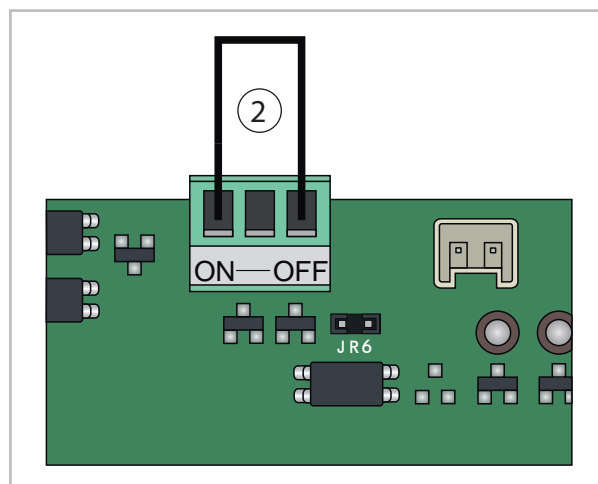


Fig. 51: Closed contact

2: Operation

REMKO RVD series

9 Before commissioning

After leak testing has been successfully completed, connect the vacuum pump via the pressure gauge station to the valve connections on the outdoor unit (see chapter "Leak testing") and create a vacuum.

Perform the following checks prior to putting the unit into operation for the first time and after any work on the cooling cycle. Record the results in the commissioning report:

- Check all refrigerant piping and valves for leak-tightness using leak detection spray or soapy water.
- Check the refrigerant piping and insulation for damage.
- Check the electrical connection between the indoor unit and the outdoor unit for correct polarity.
- Check that all fastenings, mountings, etc. are firm and at the correct level.

10 Commissioning

! NOTICE!

Commissioning should only be performed by specially trained personnel and documented after the certificate has been issued. Observe the operating manuals for the indoor unit and outdoor unit when commissioning the entire system.

Once all the components have been connected and tested, the system can be put into operation. A functional check should be performed to verify its correct function and identify any unusual operating behaviour prior to handing it over to the operator.

! NOTICE!

Check that the shut-off valves and valve caps are tight after carrying out any work on the cooling cycle. Use appropriate sealant products as necessary.

Functional checks and test run

Check the following points:

- Leak-tightness of the refrigerant piping.
- Compressor and fan running smoothly.
- In cooling mode, cold air output by the indoor unit, and warm air output by the outdoor unit.
- Function test of the indoor unit and all program sequences.
- Check of the surface temperature of the suction pipe and that the vaporiser is not overheating. To measure the temperature, hold the thermometer to the suction pipe and subtract the boiling point temperature reading on the pressure gauge from the measured temperature.
- Record the measured temperatures in the commissioning report.

Function test of the cooling and heating modes

1. ➤ Remove the protective caps from the valves.
2. ➤ Start the commissioning procedure by briefly opening the shut-off valves on the outdoor unit until the pressure gauge indicates a pressure of approx. 2 bar.
3. ➤ Check all connections for leaks with leak detection spray and suitable leak detectors.
4. ➤ If no leaks are found, fully open the shut-off valves by turning them anti-clockwise using a spanner. If leaks are found, remedy the faulty connection. It is imperative that the vacuum creation and drying steps are repeated.
5. ➤ Activate the main circuit breaker or fuse.
6. ➤ Use the remote control to switch on the unit and select the cooling mode, maximum fan speed and lowest target temperature.
7. ➤ Check the overheating, outside, inside, outlet and vaporisation temperatures and record the measured values in the commissioning report. Check the correct function and settings of all regulation, control and safety devices.
8. ➤ Check the unit control system using the functions described in the chapter "Operation". Timer, temperature setting, fan speeds and switching to ventilation or dehumidification mode.
9. ➤ Check the correct function of the condensate drainage line by pouring distilled water into the condensate tray. A bottle with a spout is recommended for pouring the water into the condensate tray.
10. ➤ Switch the indoor unit to heating mode.
11. ➤ During the test run, check the functionality of all of the previously described safety devices.
12. ➤ Record the measured values into the commissioning report and familiarise the operator with the system.
13. ➤ Remove the pressure gauge. Check that seals have been fitted in the sealing caps.
14. ➤ Re-install all disassembled parts.

11 Shutdown

Temporary shutdown

1. ➤ Let the indoor unit run for 2 to 3 hours in recirculation 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 electrical power supply to the unit.
4. ➤ Cover the unit as far as possible with plastic foil in order to protect it from the influences of weather.

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.

REMKO RVD series

12 Troubleshooting, customer service and fault analysis

12.1 Troubleshooting and customer service

The unit and components are manufactured using state-of-the-art production methods and tested several times to verify their correct function. 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, defective mains fuse / main switch in OFF position	Does all other electrical equipment function correctly?	Check the voltage and if necessary, wait for it to come back on
	Damaged power supply	Does all other elec. equipment function correctly?	Repair by specialist firm
	Wait time after switching on is too short	Have approx. 5 minutes elapsed since the restart?	Schedule longer wait times
	Temperature outside operating range	Are the fans in the indoor unit and outdoor unit working correctly?	Observe temperature ranges of 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
	High-pressure / low-pressure switches have triggered	Check refrigerant pressure and look for leaks if necessary	Rectify leakage and restart
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
	Defective remote control	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 in remote control jammed / two buttons pressed at same time	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	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
	Neither cooling nor heating mode has been set	Does the cooling symbol appear on the display?	Correct the settings for the unit
	Fins on outdoor unit blocked by foreign objects	Is the fan on the outdoor component running? Are the fins unobstructed?	Check the fan or winter fan speed control, reduce the air resistance
	Leaking cooling cycle	Are there signs of frost on the exchanger fins of the indoor unit?	Repair by specialist
	Outdoor unit iced up	Check outdoor unit. Has the cassette probe on the outdoor unit been correctly positioned?	De-ice and fit the probe at the point where the most ice forms
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? Check there is no blockage in the pipe.	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. If the liquid level switch or the condensate pump is defective, have them replaced
	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

NOTE

If the outdoor unit makes noises at low outside temperatures, even although it is switched off, this is not a malfunction. This is the winding of the compressor being run briefly in order to heat up the oil within it and also to guarantee the viscosity at low ambient temperatures. If you do not use the unit in the winter then you can switch off the breaker. Switch it back on again at least 12 hours before the next time that the unit will be required!

REMKO RVD series

Malfunction indicated by flashing code RVD 355-525 DC

Error description	Number of flashes per second) ¹⁾	LED timer ²⁾	Error code
EEPROM error, indoor unit	1	OFF	E0
Communication error between indoor unit and outdoor unit	2	OFF	E1
Evaporator fan motor speed control not OK	4	OFF	E3
Room air temperature probe faulty	5	OFF	E4
Evaporator temperature probe faulty	6	OFF	E5
No cooling capacity after 30 minutes	7	OFF	EC
Condensate pump liquid level switch triggered	8	OFF	EE
Safety shut-down due to increased power consumption	1	ON	F0
Outdoor unit air inlet temperature probe faulty	2	ON	F1
Condenser outlet temperature probe faulty	3	ON	F2
Temperature probe for heat gas line faulty	4	ON	F3
EEPROM error, outdoor unit	5	ON	F4
Condenser fan speed control not OK	6	ON	F5
Suction pipe temperature probe in AT faulty	7	ON	F6
Fin motor defective or not connected			F7
Inverter error	1	FLASHES	P0
Over/undervoltage error	2	FLASHES	P1
Safety shut-down compressor excess temperature	3	FLASHES	P2
Safety shut-down due to low outside temperature	4	FLASHES	P3
Compressor control faulty	5	FLASHES	P4
Mode conflict	6	FLASHES	P5
Low pressure alarm	7	FLASHES	P6

¹⁾ LED [1] in the bottom figure

²⁾ LED [2] in the bottom figure

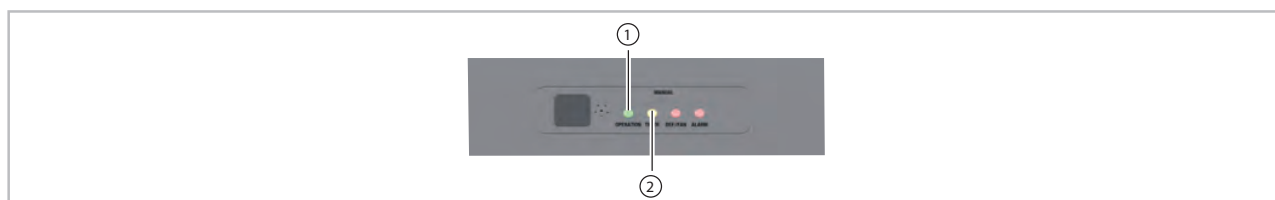


Fig. 52: Malfunction indicated by flashing code RVD 355-525 DC

Malfunction indicated by flashing code RVD 685-1055 DC

Error description	Number of flashes per second) ¹⁾	LED timer ²⁾	Error code ³⁾
EEPROM error, indoor unit	1	OFF	E0
Communication error between indoor unit and outdoor unit	2	OFF	E1
Evaporator fan motor speed control not OK	4	OFF	E3
Room air temperature probe faulty	5	OFF	E4
Evaporator temperature probe faulty	6	OFF	E5
No cooling capacity after 30 minutes	7	OFF	EC
Condensate pump liquid level switch triggered	8	OFF	EE
Safety shut-down due to increased power consumption	1	ON	F0
Outdoor unit air inlet temperature probe faulty	2	ON	F1
Condenser outlet temperature probe faulty	3	ON	F2
Temperature probe for heat gas line faulty	4	ON	F3
EEPROM error, outdoor unit	5	ON	F4
Condenser fan speed control not OK	6	ON	F5
Temperature probe suction pipe in outdoor unit faulty	7	ON	F6
Fin motor defective or not connected			F7
Inverter error	1	FLASHES	P0
Over/undervoltage error	2	FLASHES	P1
Safety shut-down compressor excess temperature	3	FLASHES	P2
Safety shut-down due to low outside temperature	4	FLASHES	P3
Compressor control faulty	5	FLASHES	P4
Mode conflict	6	FLASHES	P5
Low pressure alarm	7	FLASHES	P6

¹⁾ LED [1] in the bottom figure

²⁾ LED [2] in the bottom figure

³⁾ LED [3] in the bottom figure

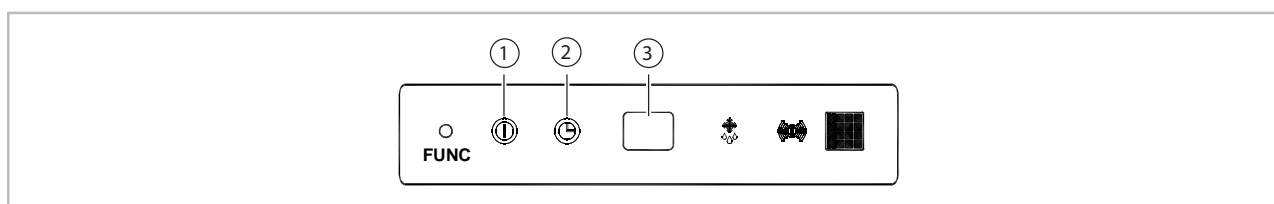


Fig. 53: Malfunction indicated by flashing code RVD 685-1055 DC

REMKO RVD series

12.2 Indoor unit fault analysis

Error code:	E0 / F4
Reason:	The control board of the outdoor unit or indoor unit cannot read the unit memory (EEPROM)
Cause:	<ul style="list-style-type: none">■ Installation error■ Control boards of outdoor unit or indoor unit defective

Switch off voltage, switch on again 2 minutes later. Is the error still present?	
↓YES	
Replace the circuit boards of the outdoor unit and indoor unit in turn, in order to locate the defective EEPROM	

Error code:	E1
Reason:	The indoor unit does not receive a signal from the outdoor unit within 110 seconds.
Cause:	<ul style="list-style-type: none"> ■ Electrical connection not configured correctly ■ Control boards outdoor unit or indoor unit defective

Switch off voltage, switch on again 2 minutes later. Is the error still present?		
↓YES		
Measure the voltage between the "S" and "N" terminals of the outdoor unit. Is the measured value positive?	NO →	Check electrical connections in the indoor unit. Are they OK?
↓YES		↓YES
Check electrical connections in the outdoor unit. Are they OK?		Replace the control boards of the indoor unit. Is the fault remedied?
↓YES		↓NO
Is the transformer OK?		Replace the control boards of the outdoor unit
	NO →	Replace the transformer
↓YES		
Replace the control boards of the outdoor unit. Is the fault remedied?		
↓NO		
Replace the control boards of the indoor unit		

REMKO RVD series

Error code:	E3 / F5
Reason:	If the fan speed of the indoor unit/outdoor unit falls below 300 rpm, the unit switches off and the display shows error code E3 or E5
Cause:	<ul style="list-style-type: none"> ■ Electrical connection faulty ■ Evaporator fan wheel defective ■ Evaporator fan motor defective ■ Control board faulty

Switch off voltage, switch on again 2 minutes later. Is the error still present?	NO →	The unit operates normally.
↓ YES		
De-energise the unit and attempt to turn the fan wheel by hand. Does it rotate freely?	NO →	Check the motor and the fan wheel bearing, and replace the defective parts.
↓ YES		
Check the electrical connections. Are these correctly implemented?	NO →	Correctly establish the electrical connection
↓ YES		
Measure the voltage at the corresponding connector plug on the control board (see section <i>Procedure</i> on page 57). Does the measured voltage lie within the tolerance range?	NO →	Replace the control board.
↓ YES		
Replace the fan motor. Is the fault remedied?	NO →	

Procedure

DC fan motor of the indoor unit (control chip is installed in the motor):

Switch on the voltage to the unit. In standby mode, measure the unit between terminals 1-3 and 4-3 of the connector plug. Check the measured values against those listed in the table below. If these differ, there is a problem with the control board and it must be replaced.

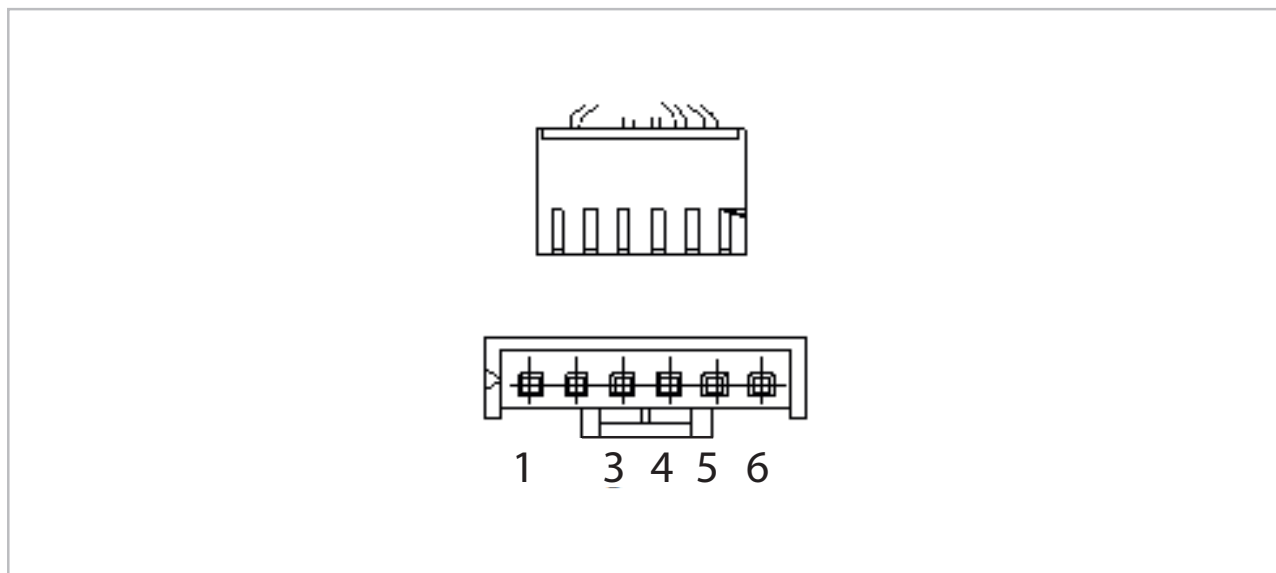


Fig. 54: Motor measurements

Terminal	Colour	Voltage
1	Red	280V~380 V
2	---	---
3	Black	0 V
4	White	17-17.5V
5	Yellow	0~5.6V
6	Blue	17-17.5V

DC fan motor of the outdoor unit (control chip is installed in the motor):

Measure the resistance between terminals 1-3 and 4-3. This should be roughly identical. If the resistance deviates significantly, assume that the motor is defective and must be replaced.

REMKO RVD series

Error code:	EC
Reason:	The evaporator probe T2 measures the actual value with the compressor start and takes this as the reference value T_{Start} . If, 5 minutes after the compressor start, the value T_{Start} has not dropped by 2 °C for at least 4 seconds then the system assumes that the refrigerant is low. The measurement is performed a total of 3 times before the display shows the error code "EC".
Cause:	<ul style="list-style-type: none"> ■ Refrigerant low or cooling circuit blocked ■ Evaporator probe T2 defective ■ Indoor unit control board defective

Switch off voltage, switch on again 2 minutes later. Is the error still present?		
↓YES		
Check whether the indoor unit blows out cold air.	YES →	Check the position and function of the evaporator probe T2. Is it correctly seated and with the correct resistance?
↓NO		↓YES
Check the cooling circuit for leaks. Leaks found?		Exchange the control boards of the indoor unit.
	YES →	Remedy leaks and put the unit back into operation.
↓NO		
Check the cooling circuit for any blockages. Are the shut-off valves on the outdoor unit open?		

Error code:	E4 / E5 / F1 / F2 / F3
Reason:	If the test voltage of the probes is lower than 0.06 V or higher than 4.94 V then the display shows the error code of the corresponding probe.
Cause:	<ul style="list-style-type: none"> ■ Electrical connection faulty ■ Temperature probe defective ■ Control board defective

Check the connecting cable between the control board and the temperature probe. Is it OK and correctly connected?	NO ↓	Establish a proper connection.
↓YES		
Check the probe for correct resistance, depending on the temperature (see resistance table)	NO ↓	Replace the probe.
↓YES		
Replace the corresponding control board.		

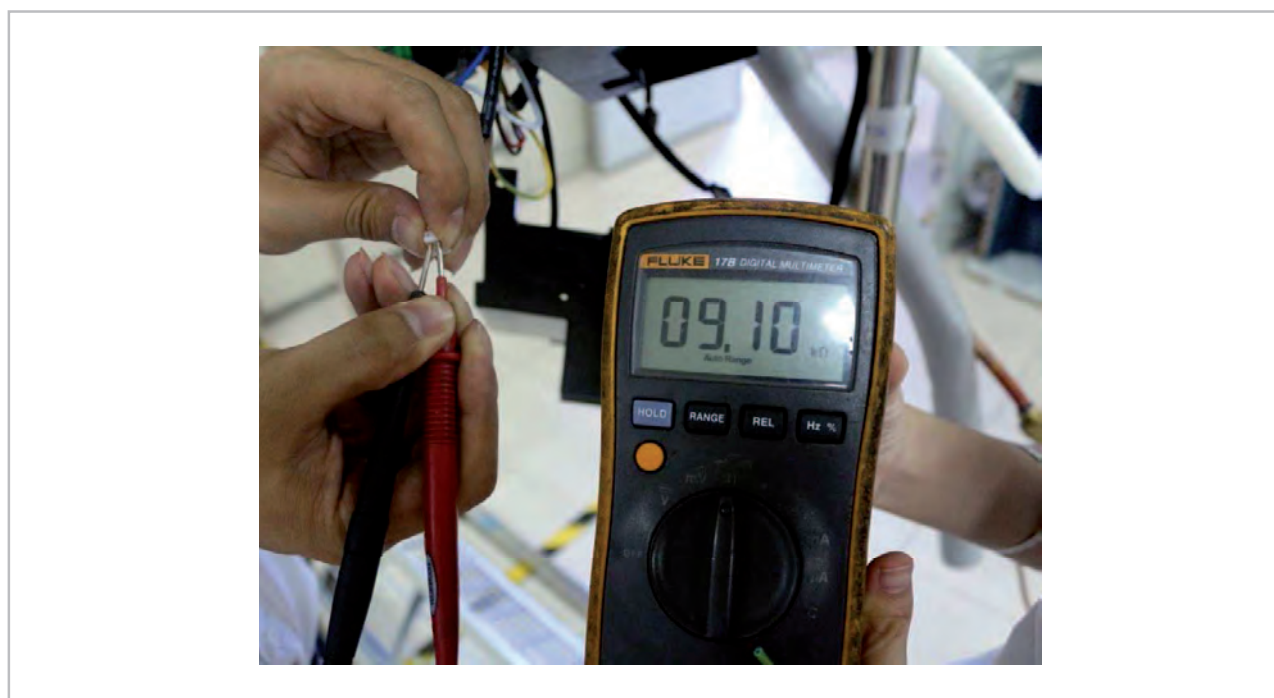


Fig. 55: Check the probes

REMKO RVD series

Error code:	F0
Reason:	Safety shutdown due to overly high current consumption of individual unit components
Cause:	<ul style="list-style-type: none"> Faulty power supply Cooling circuit blocked Faulty control board Electrical connections faulty Compressor defective

Check the supply voltage. Is this correct?	NO →	Switch the unit off and ensure correct supply voltage.
↓YES		
Check the cooling circuit for any blockages. Is the cooling circuit OK?	NO →	Remove the blockage (shut-off valve open?)
↓YES		
Check the winding resistances of the compressor. Are they OK?	NO →	Replace the compressor.
↓YES		
Check the electrical connections. Are these correctly implemented?	NO →	Replace or correct the electrical connections.
↓YES		
Does the transformer operate fault-free?	NO →	Replace the transformer or control boards of the outdoor unit.
↓YES		
Replace the outdoor unit.		

Error code:	P0
Reason:	If the power supply to the compressor controller is faulty, the display shows the error code "P0" and the unit switches off
Cause:	<ul style="list-style-type: none"> ■ External enabling contact open ■ Electrical connection faulty ■ Faulty control board ■ Condenser fan motor defective or blocked ■ Compressor defective

Check the external enabling contact CN23 and the jumper JR6. Are both contacts open? (See <i>Chapter 8.6 'Connection of a superordinate controller provided by the customer' on page 47</i>)	YES →	Close the external enabling contact CN23 or the jumper JR6.
↓NO		
Check the connecting cables between the control board and compressor? Are they faulty?	YES →	Establish a correct connection between the control board and compressor.
↓NO		
Check the inverter controller (see section <i>'Check the inverter controller' on page 62</i>). Fault eliminated?	NO →	Replace the control board.
↓YES		
Check the condenser fan motor. Is it working correctly?	NO →	See troubleshooting fault F5
↓YES		
Check the winding resistances of the compressor. Are they OK?	NO →	Replace the compressor.
↓YES		
Exchange the control boards of the outdoor unit.		

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Check the inverter controller

Switch off the power supply to the unit. Wait until the capacitors are fully discharged and disconnect the compressor from the control board.

Check the resistances at the outputs of the control board with the aid of a digital voltmeter as follows:

Voltmeter		Normal resistance
(+) Red	(-) Black	
U	N	∞ (multiple M Ω)
V		
W		
(+) Red		

Error code:	P1
Reason:	Overvoltage or undervoltage protection has tripped
Cause:	<ul style="list-style-type: none"> Faulty supply voltage Refrigerant low or cooling circuit blocked Faulty control board

Check the power supply. Is the supply voltage correct?	NO →	Switch the unit off and have the power supply checked/corrected.
↓YES		
Check the electrical connections. Are they OK?	NO →	Replace the electrical connections.
↓YES		
Switch the power on and put the unit into standby mode. Measure the voltage on the board, at contacts "P" and "N". This should be approx. 310 V, 340 V or 380 V DC. Now start the unit. The voltage between "P" and "N" should now be between 220-400V. Is the correct voltage applied?	NO →	Replace the control board.
↓YES		
Check the transformer. Is a defect present?	NO →	Replace the control board.
↓YES		
Replace the transformer.		

Error code:	P2 (with units with a thermal contact)
Reason:	If the test voltage of the thermal contact does not lie at 5 V, then the display shows the error message "P2"
Cause:	<ul style="list-style-type: none"> Faulty supply voltage Refrigerant low or cooling circuit blocked Faulty control board

Check the air flow volumes of the indoor unit and outdoor unit. Are they blocked or dirty?	YES →	Clean the filter or heat exchanger and ensure a sufficient air flow volume.		
↓NO				
Switch off the power supply to the unit and switch it on again after 10 mins. Does the unit start up?				
↓YES				
Check the temperature of the compressor. Has it heated up?	NO →	Check the thermal contact. Is it correctly connected?		
		↓YES	↓NO	
		Measure the resistance of the thermal contact. Is it 0?		Connect it correctly.
		↓YES	NO →	Replace the thermal contact.
Check the cooling circuit. Is it OK?	YES →	Replace the control board of the outdoor unit.		

REMKO RVD series

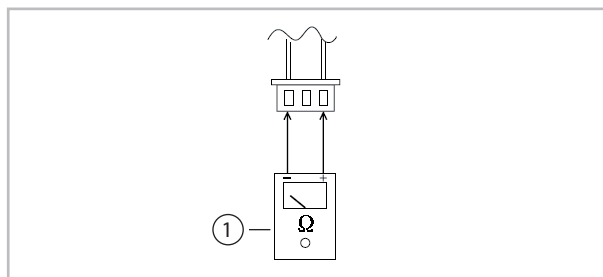
Error code:	P4
Reason:	Safety shutdown of inverter controller. Internal system monitoring triggered (e.g. communication problem between board and compressor, the compressor speed is not OK)
Cause:	<ul style="list-style-type: none"> Faulty electrical connections Inverter regulation on board defective Condenser fan motor defective Compressor defective Control board defective

Check the electrical connection between the control board and compressor. Are these correctly implemented?	YES →	Establish a proper connection.
↓ NO		
Check the inverter controller. Is this functional?	NO →	Replace the control board.
↓ YES		
Check the condenser fan motor. Is it OK?	NO →	Follow the instructions for troubleshooting fault F5
↓ YES		
Check the winding resistances of the compressor. Are they OK?	NO →	Replace the compressor
↓ YES		
Replace the control boards of the outdoor unit.		

Check individual components

Check the temperature probes

Disconnect the temperature probe from the control board and measure the resistance on the plug's contacts.



1: Multimeter

Error code:	dF
Reason:	The unit is in heating mode and the outdoor unit is being defrosted. After the defrost phase, the indoor unit automatically switches back to the last operating mode.

12.3 Resistances of the temperature probes

Probe T1, T2, T3 and T4

Temp. (°C)	Resistance (kΩ)	Temp. (°C)	Resistance (kΩ)
-20	115.27	12	18.72
-19	108.15	13	17.80
-18	101.52	14	16.93
-17	96.34	15	16.12
-16	89.59	16	15.34
-15	84.22	17	14.62
-14	79.31	18	13.92
-13	74.54	19	13.26
-12	70.17	20	12.64
-11	66.09	21	12.06
-10	62.28	22	11.50
-9	58.71	23	10.97
-8	56.37	24	10.47
-7	52.24	25	10.00
-6	49.32	26	9.55
-5	46.57	27	9.12
-4	44.00	28	8.72
-3	41.59	29	8.34
-2	39.82	30	7.97
-1	37.20	31	7.62
0	35.20	32	7.29
1	33.33	33	6.98
2	31.56	34	6.68
3	29.91	35	6.40
4	28.35	36	6.13
5	26.88	37	5.87
6	25.50	38	5.63
7	24.19	39	5.40
8	22.57	40	5.18
9	21.81	41	4.96
10	20.72	42	4.76
11	19.69	43	4.57

Temp. (°C)	Resistance (kΩ)	Temp. (°C)	Resistance (kΩ)
44	4.39	79	1.21
45	4.21	80	1.17
46	4.05	81	1.14
47	3.89	82	1.10
48	3.73	83	1.06
49	3.59	84	1.03
50	3.45	85	1.00
51	3.32	86	0.97
52	3.19	87	0.94
53	3.07	88	0.91
54	2.96	89	0.88
55	2.84	90	0.85
56	2.74	91	0.83
57	2.64	92	0.80
58	2.54	93	0.78
59	2.45	94	0.75
60	2.36	95	0.73
61	2.27	96	0.71
62	2.19	97	0.69
63	2.11	98	0.67
64	2.04	99	0.65
65	1.97	100	0.63
66	1.90	101	0.61
67	1.83	102	0.59
68	1.77	103	0.58
69	1.71	104	0.56
70	1.65	105	0.54
71	1.59	106	0.53
72	1.54	107	0.51
73	1.48	108	0.50
74	1.43	109	0.48
75	1.39	110	0.47
76	1.34	111	0.46
77	1.29	112	0.45
78	1.25	113	0.43

REMKO RVD series

Temp. (°C)	Resistance (kΩ)	Temp. (°C)	Resistance (kΩ)
114	0.42	127	0.30
115	0.41	128	0.29
116	0.40	129	0.28
117	0.39	130	0.28
118	0.38	131	0.27
119	0.37	132	0.26
120	0.36	133	0.26
121	0.35	134	0.25
122	0.34	135	0.25
123	0.33	136	0.24
124	0.32	137	0.23
125	0.32	138	0.23
126	0.31	139	0.22

Probe T5

Temp. (°C)	Resistance (kΩ)	Temp. (°C)	Resistance (kΩ)
-20	542.7	-2	200.7
-19	511.9	-1	190.5
-18	483.0	0	180.9
-17	455.9	1	171.9
-16	430.5	2	163.3
-15	406.7	3	155.2
-14	384.3	4	147.6
-13	363.3	5	140.4
-12	343.6	6	133.5
-11	325.1	7	127.1
-10	307.7	8	121.0
-9	291.3	9	115.2
-8	275.9	10	109.8
-7	261.4	11	104.6
-6	247.8	12	99.69
-5	234.9	13	95.05
-4	222.8	14	90.66
-3	211.4	15	86.49

Temp. (°C)	Resistance (kΩ)	Temp. (°C)	Resistance (kΩ)
16	82.54	51	18.96
17	78.79	52	18.26
18	75.24	53	17.58
19	71.86	54	16.94
20	68.66	55	16.32
21	65.62	56	15.73
22	62.73	57	15.16
23	59.98	58	14.62
24	57.37	59	14.09
25	54.89	60	13.59
26	52.53	61	13.11
27	50.28	62	12.65
28	48.14	63	12.21
29	46.11	64	11.79
30	44.17	65	11.38
31	42.33	66	10.99
32	40.57	67	10.61
33	38.89	68	10.25
34	37.30	69	9.90
35	35.78	70	9.57
36	34.32	71	9.25
37	32.94	72	8.94
38	31.62	73	8.64
39	30.36	74	8.36
40	29.15	75	8.08
41	28.00	76	7.82
42	26.90	77	7.57
43	25.86	78	7.32
44	24.85	79	7.09
45	23.89	80	6.86
46	22.89	81	6.64
47	22.10	82	6.43
48	21.26	83	6.23
49	20.46	84	6.03
50	19.69	85	5.84

Temp. (°C)	Resistance (kΩ)	Temp. (°C)	Resistance (kΩ)
86	5.66	109	2.86
87	5.49	110	2.78
88	5.32	111	2.70
89	5.16	112	2.63
90	5.00	113	2.56
91	4.85	114	2.49
92	4.70	115	2.42
93	4.56	116	2.36
94	4.43	117	2.29
95	4.29	118	2.23
96	4.17	119	2.17
97	4.05	120	2.12
98	3.93	121	2.06
99	3.81	122	2.01
100	3.70	123	1.96
101	3.60	124	1.91
102	3.49	125	1.86
103	3.39	126	1.81
104	3.30	127	1.76
105	3.20	128	1.72
106	3.11	129	1.67
107	3.03	130	1.63
108	2.94		

REMKO RVD series

13 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!



Contact Remko GmbH & Co. KG to sign up for a maintenance contract

Care

- Ensure that the indoor unit and outdoor unit are free of dirt, mould and other deposits.

- Only clean the units with 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 indoor unit and outdoor unit prior to long shutdown periods.

Maintenance

- It is recommended that you take out a maintenance contract with an annual service from an appropriate specialist firm.
- For systems which operate year-round (e.g. in server rooms), the maintenance intervals must be reduced accordingly.



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

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 below

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. The filter is held in place by the flaps screwed in at the side of the guard (Fig. 56).
3. ➤ Clean the grill and cover with a soft, damp cloth.
4. ➤ Switch the power supply back on.

Air filter for indoor unit

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



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.

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. 56).
3. ➤ Tilt the filter and lift it out (Fig. 56).
4. ➤ Clean the filter with a commercially available vacuum cleaner (Fig. 57). 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. 58).
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.

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.



Fig. 57: Cleaning with a vacuum cleaner



Fig. 58: Cleaning with lukewarm water



Fig. 56: Pull out the filter

REMKO RVD series

14 Exploded view and spare parts lists

14.1 Exploded view - Indoor unit RVD 355-525 DC

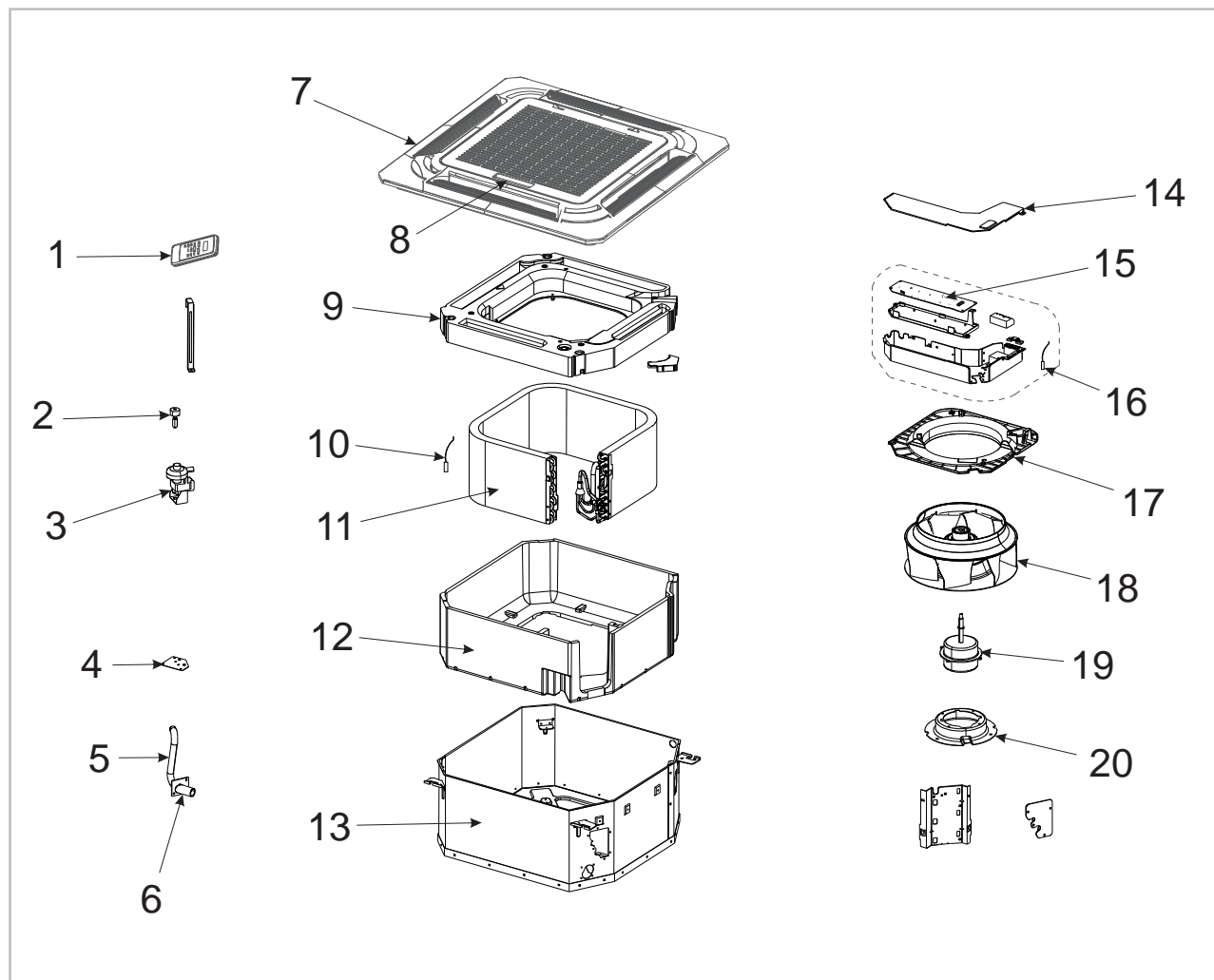


Fig. 59: Exploded view of the unit RVD 355-525 DC IT

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

14.2 Spare parts list - Indoor unit RVD 355-525 DC



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	Infrared remote control
2	Condensate pump liquid level switch
3	Condensate pump
4	Condensate pump mounting plate
5	Condensate hose
6	Condensate connection
7	Unit trim
8	Display board
9	Condensate tray
10	Temperature probe, evaporator
11	Evaporator
12	Evaporator housing
13	Unit housing
14	Terminal block cover
15	Control board
16	Temperature probe, indoor air
17	Air inlet nozzle
18	Fan wheel
19	Fan motor
20	Fan motor mounting plate

REMKO RVD series

14.3 Exploded view - Indoor unit RVD 685-1055 DC

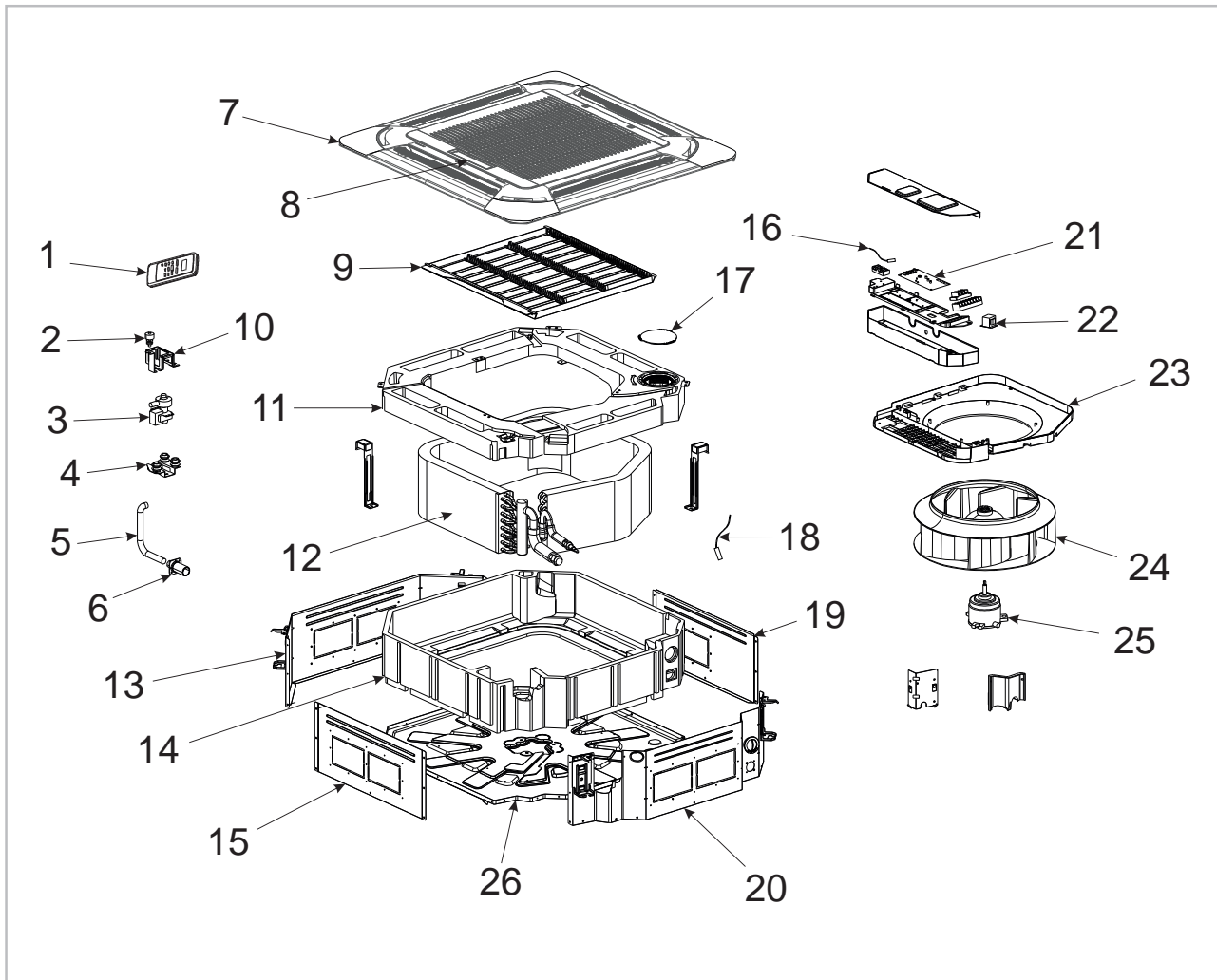


Fig. 60: Exploded view of the unit RVD 685-1055 DC IT

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

14.4 Spare parts list - Indoor unit RVD 685-1055 DC



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	Infrared remote control
2	Condensate pump liquid level switch
3	Condensate pump
4	Condensate pump mounting plate
5	Condensate hose
6	Condensate connection
7	Unit trim
8	Display board
9	Air filter
10	Liquid level switch mounting plate
11	Condensate tray
12	Evaporator
13	Casing part, left
14	Unit housing
15	Casing part, front
16	Temperature probe, indoor air
17	Condensate tray sealing cap
18	Temperature probe, evaporator
19	Casing part, rear
20	Casing part, right
21	Control board
22	Transformer
23	Air inlet nozzle
24	Fan wheel
25	Fan motor
26	Housing floor

REMKO RVD series

15 Exploded view - Outdoor unit RVD 355 DC

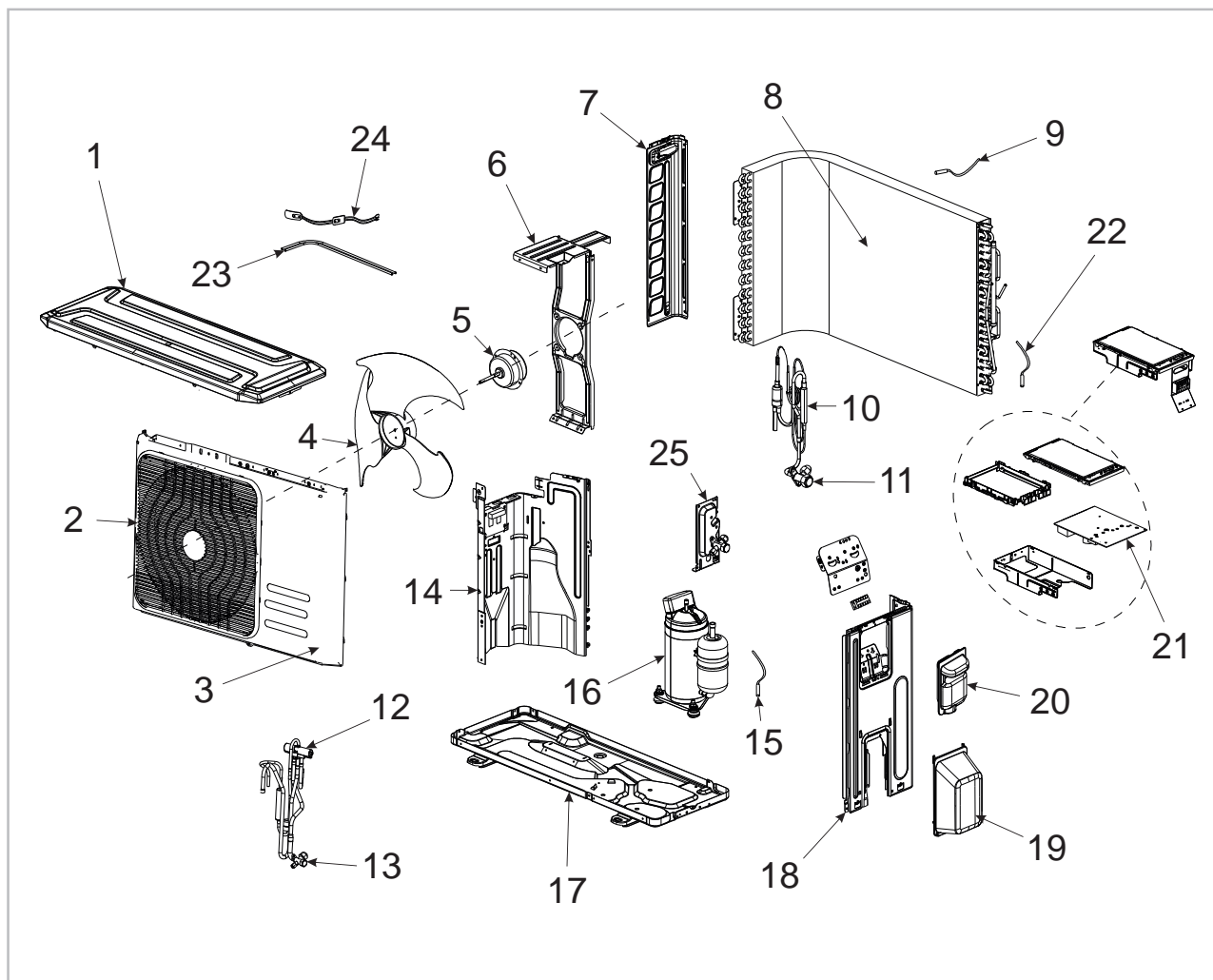


Fig. 61: Exploded view of the unit RVD 355 DC AT

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

16 Spare parts list - Outdoor unit RVD 355 DC



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	Cover panel
2	Protection grid, front wall
3	Front panel
4	Fan blade
5	Fan motor
6	Fan motor mounting plate
7	Corner panel, left
8	Condenser
9	Air inlet temperature probe
10	Electronic injection valve
11	Shut-off valve, injection pipe
12	4-way reversing valve
13	Shut-off valve, suction pipe
14	Partitioning panel
15	Temperature probe for heat gas line
16	Compressor
17	Floor panel
18	Side panel, right
19	Refrigerant connections cover
20	Terminal block cover
21	Control board
22	Temperature probe for condenser outlet
23	Condensate tray heating
24	Crankcase heating
25	Mounting plate for refrigerant connections

REMKO RVD series

17 Exploded view - Outdoor unit RVD 525 DC

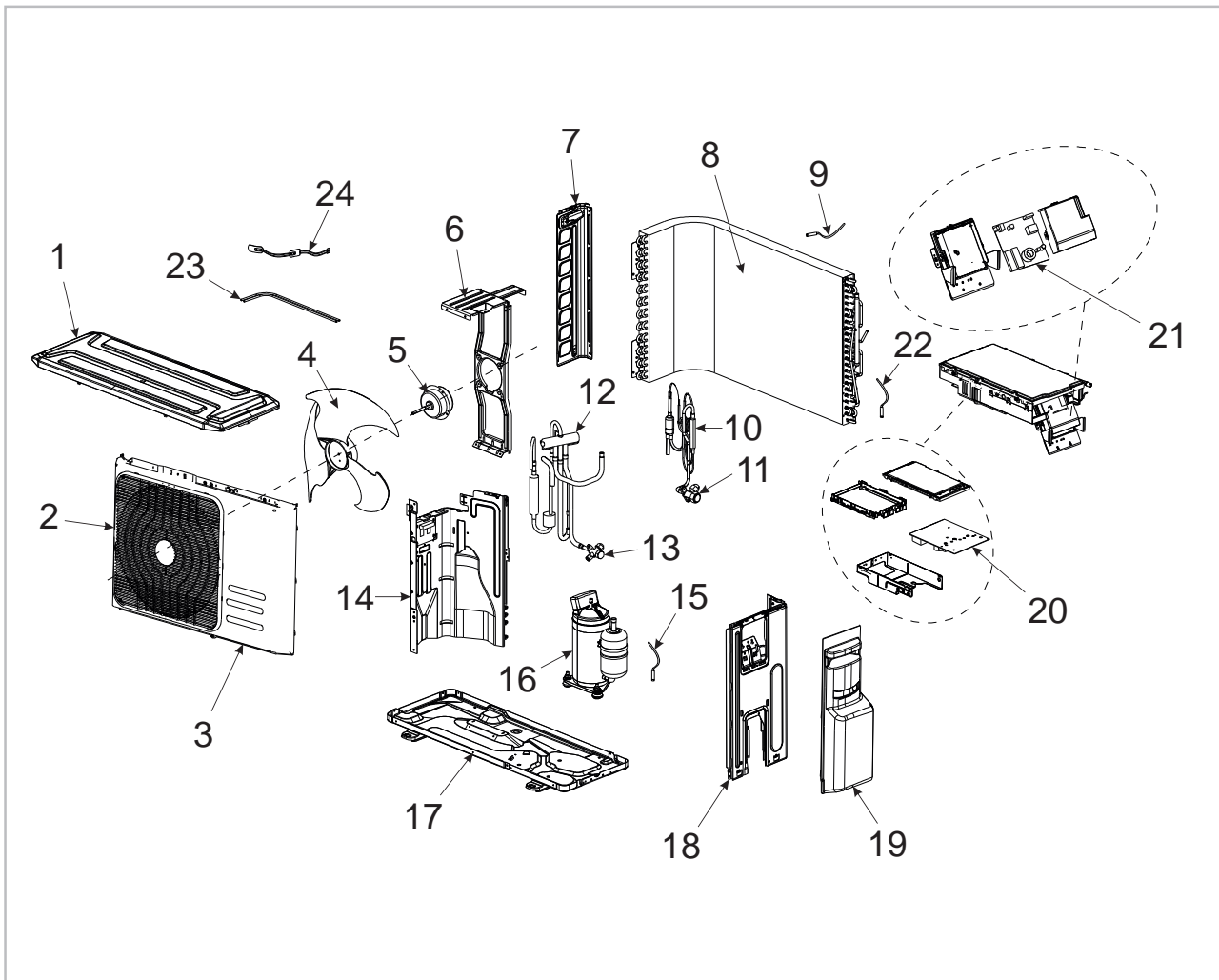


Fig. 62: Exploded view of the unit RVD 525 DC AT

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

18 Spare parts list - Outdoor unit RVD 525 DC



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	Cover panel
2	Protection grid, front wall
3	Front panel
4	Fan blade
5	Fan motor
6	Fan motor mounting plate
7	Corner panel, left
8	Condenser
9	Air inlet temperature probe
10	Electronic injection valve
11	Shut-off valve, injection pipe
12	4-way reversing valve
13	Shut-off valve, suction pipe
14	Partitioning panel
15	Temperature probe for heat gas line
16	Compressor
17	Floor panel
18	Side panel, right
19	Refrigerant connections cover
20	Control board
21	Auxiliary circuit board
22	Temperature probe for condenser outlet
23	Condensate tray heating
24	Crankcase heating

REMKO RVD series

19 Exploded view - Outdoor unit RVD 685 DC

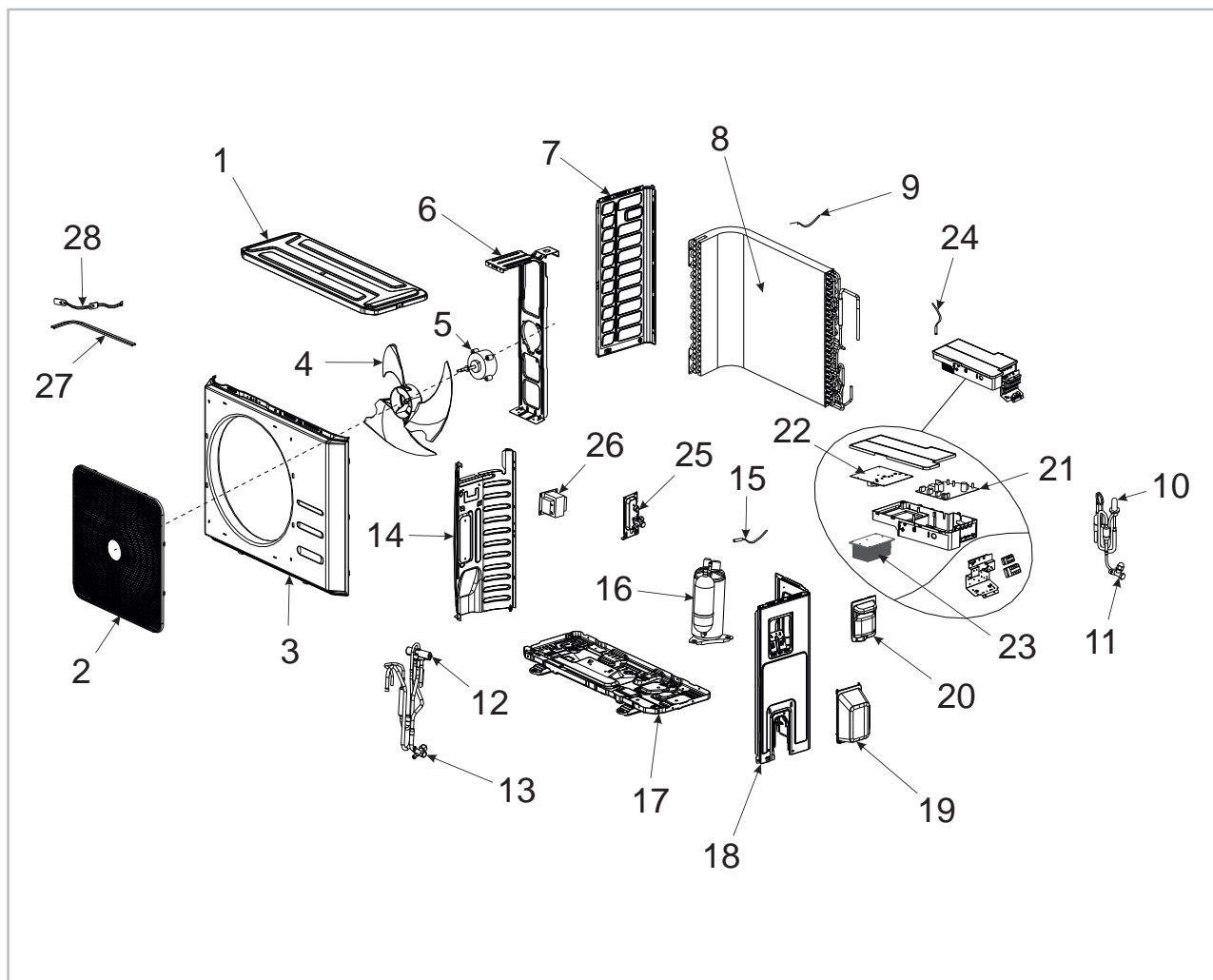


Fig. 63: Exploded view of the unit RVD 685 DC AT

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

20 Spare parts list - Outdoor unit RVD 685 DC



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	Cover panel
2	Protection grid, front wall
3	Front panel
4	Fan blade
5	Fan motor
6	Fan motor mounting plate
7	Corner panel, left
8	Condenser
9	Air inlet temperature probe
10	Electronic injection valve
11	Shut-off valve, injection pipe
12	4-way reversing valve
13	Shut-off valve, suction pipe
14	Partitioning panel
15	Temperature probe for heat gas line
16	Compressor
17	Floor panel
18	Side panel, right
19	Refrigerant connections cover
20	Terminal block cover
21	Control board
22	Inverter board
23	Cooling fins
24	Temperature probe for condenser outlet
25	Mounting plate for refrigerant connections
26	Transformer
27	Condensate tray heating
28	Crankcase heating

REMKO RVD series

21 Exploded view - Outdoor unit RVD 1055 DC

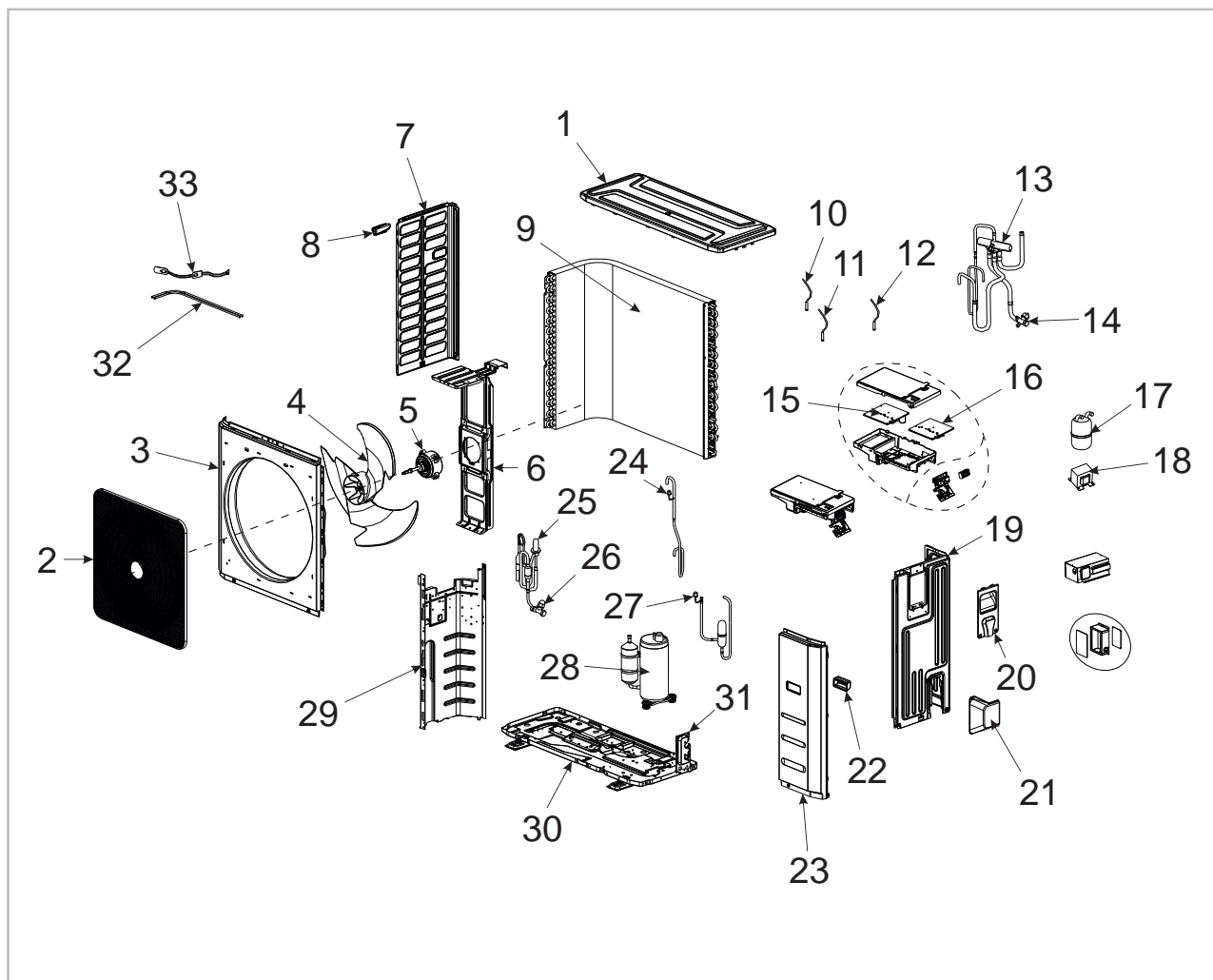


Fig. 64: Exploded view of the unit RVD 1055 DC AT

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

22 Spare parts list - Outdoor unit RVD 1055 DC



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	Cover panel
2	Protection grid, front wall
3	Front panel
4	Fan blade
5	Fan motor
6	Fan motor mounting plate
7	Side panel, left
8	Recessed grip side panel, left
9	Condenser
10	Temperature probe for condenser outlet
11	Temperature probe for heat gas line
12	Air inlet temperature probe
13	4-way reversing valve
14	Shut-off valve, suction pipe
15	Inverter board
16	Control board
17	Liquid separator
18	Transformer
19	Side panel, right
20	Terminal block cover
21	Shut-off valve cover
22	Recessed grip front panel, right
23	Front panel, right
24	Low pressure switch
25	Electronic injection valve
26	Shut-off valve, injection pipe
27	High pressure switch
28	Compressor
29	Partitioning panel
30	Floor panel

REMKO RVD series

No.	Designation
31	Shut-off valve mounting plate
32	Condensate tray heating
33	Crankcase heating

23 Index

C

Care and maintenance	68
Cleaning	
Air filter for indoor unit	68
Condensate pump	69
Cover on the indoor unit	68
Condensate drainage connection	31
Customer service	50

D

Display on indoor unit	16
Disposal of equipment	8

E

Electrical drawings	39, 41, 43, 44, 45, 46
Electrical wiring	33
Electrical wiring diagram	35, 36, 37, 38
Environmental protection	8
Exploded view of the unit	70, 72, 74, 76, 78, 80

F

Flashing code, fault display	52, 53
Fresh air connection	27
Fresh air inlet	28
Function test of the cooling and heating modes	49
Functional checks	48

I

Infrared remote control	15
Installation location, selection	24
Installation materials	23
Intended use	7

K

Keys on the remote control	17
----------------------------	----

M

Maintenance	68
Malfunction indicated by flashing code	52, 53
Malfunctions	
Checks	50
Possible causes	50
Remedial measures	50
Manual mode	15
Minimum clearances	25

O

Oil return measures	26
Ordering spare parts	71, 73, 75, 77, 79, 81

R

Remote control	
Keys	17
Resistances	
Temperature probes	65

S

Safe drainage in the event of leakages	31
Safety	
Dangers of failure to observe the safety	
notes	5
General	5
Identification of notes	5
Instructions for the operator	6
Note for inspection work	6
Note for installation work	6
Note for maintenance work	6
Personnel qualifications	5
Safety-conscious working	6
Unauthorised modification	7
Unauthorised replacement part manufacture	7
Selection of installation location	24
Setting of	
Address assignment MCC-1	40, 42
Anti-cold air function	40, 42
Automatic restart after power failure	40, 42
DIP switch	40, 42
Fan behaviour without demand	40, 42
Main / slave	42
Mode priority	40
Power	42
Temperature compensation	40, 42
Shutdown	
Permanent	49
Temporary	49
Spare parts list	71, 73, 75, 77, 79, 81
Superordinate controller, connection	47

T

Temperature probes	
Resistances	65
Test run	48
Troubleshooting and customer service	50

U

Unit installation	26
-------------------	----

W

Wall opening	23
Warranty	7
Wired remote control	16

REMKO QUALITY WITH SYSTEMS

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