

Operating and installation instructions

REMKO RVT series

Wall units - cooling and heating

RVT 265 DC, RVT 355 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	11
2.3	Performance data	12
3	Design and function	16
3.1	Characteristics of REMKO inverter air conditioner with split design	16
3.2	Unit description	18
4	Operation	19
4.1	General notes	19
4.2	Indicators on indoor unit	19
4.3	Keys on the remote control	20
5	Installation instructions for qualified personnel	28
5.1	Important notes prior to installation	28
5.2	Wall openings	28
5.3	Installation materials	28
5.4	Layout, indoor unit	28
5.5	Installation, mounting outdoor unit	29
5.6	Minimum clearances	31
5.7	Connection variants for the indoor unit	31
5.8	Oil return measures	32
5.9	Connection of the indoor unit when the refrigerant piping is installed under the plaster	33
5.10	Wall bracket of the indoor units	33
6	Installation	34
6.1	Installation of the indoor unit	34
6.2	Connecting the refrigerant piping	35
6.3	Additional notes on connecting the refrigerant piping	37
6.4	Leak testing	37
6.5	Adding refrigerant	38
7	Condensate drainage connection and safe drainage	38
8	Electrical wiring	40
8.1	General Information	40
8.2	Connecting the indoor unit	40
8.3	Connecting the outdoor unit	41

REMKO RVT series

8.4	Electrical wiring diagram.....	41
8.5	Electrical drawings.....	43
8.6	Connection of a superordinate controller	45
9	Before commissioning.....	47
10	Commissioning.....	47
11	Troubleshooting, fault analysis and customer service.....	49
11.1	Troubleshooting and customer service.....	49
11.2	Indoor unit fault analysis.....	51
11.3	Resistances of the temperature probes.....	62
12	Care and maintenance.....	65
13	Shutdown.....	67
14	Exploded view and spare parts lists.....	68
14.1	Exploded view of indoor unit RVT 265-355 DC IT.....	68
14.2	Spare parts list for the indoor unit RVT 265-355 DC IT.....	69
14.3	Exploded view of the outdoor units RVT 265-355 DC AT.....	70
14.4	Spare parts list for outdoor units RVT 265-355 DC AT.....	71
15	Index.....	72

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.

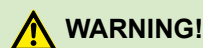
Safety notes in this manual are indicated by symbols. Safety notes are introduced with signal words which help to highlight the magnitude of the danger in question.



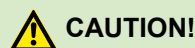
Contact with live parts poses an immediate danger of death due to electric shock. Damage to the insulation or individual components may pose a danger of death.



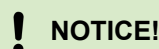
This combination of symbol and signal word warns of a situation in which there is immediate danger, which if not avoided may be fatal or cause serious injury.



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



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.



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 RVT 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 RVT 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		RVT 265 DC	RVT 355 DC
Operating mode		Inverter wall-mounted room air conditioner combination for cooling and heating	
Nominal cooling output ¹⁾	kW	2.63 (0.99-4.15)	3.52 (1.03-4.81)
Energy efficiency ratio SEER ¹⁾		9.2	9.0
Rated power consumption, electrical cooling ¹⁾	kW	0.483	0.75
Rated elec. curr. consump., cooling ¹⁾	A	2.1	3.3
Power consumption, annual, Q _{CE} ³⁾	kWh	102	137
Energy efficiency ratio, cooling ¹⁾		A+++	
Nominal heat capacity ²⁾	kW	4.10 (0.75-6.99)	4.24 (0.75-7.19)
Energy efficiency ratio SCOP ⁴⁾		5.3	
Rated power consumption, electrical heating ²⁾	kW	0.834	0.943
Rated elec. curr. consump., heating ²⁾	A	3.6	4.1
Power consumption, annual, Q _{HE} ³⁾	kWh	643	647
Energy efficiency ratio, heating ²⁾		A+++	
Max. power consumption	kW	2.42	3.11
Max. current consumption	A	10	13
EDP no.		1623750	1623760

Data specific to indoor unit (IT)		RVT 265 DC	RVT 355 DC
Application area (room volume), approx.	m ³	80	100
Adjustment range, room temperature	°C	+16 to +32	
Operating range	°C	+16 to +30	
Air flow volume per stage	m ³ /h	285/380/430/500/565	310/380/450/530/590
Sound pressure level per stage ⁵⁾	dB (A)	23/26/29/33/38	28/31/34/37/40
Sound pressure level, Silent/Turbo mode ⁵⁾	dB (A)	22	21
Sound power level max.	dB(A)	58	59
Enclosure class	IP	X0	
Condensate drainage connection	mm	18	
Dimensions: H/W/D	mm	298/895/248	
Weight	kg	13	
EDP no.		1623752	1623762

REMKO RVT series

Data specific to outdoor unit (AT)		RVT 265 DC	RVT 355 DC
Power supply	V/Ph/Hz	230/1~/50	
Operating range, cooling	°C	-25 to +50	
Operating range, heating	°C	-30 to +30	
Air flow rate, max.	m³/h	2000	
Enclosure class	IP	24	
Sound power level max.	dB (A)	59	61
Sound pressure level ⁵⁾	dB (A)	57	
Refrigerant ⁶⁾		R32	
Refrigerant, basic quantity	kg	0.87	
CO ₂ equivalent	t	0.58	
Operating pressure, max.	kPa	4300/1700	
Refrigerant, additional quantity >5m	g/m	20	
Refrigerant piping, max. length	m	25	
Refrigerant piping, max. height	m	10	
Refrigerant connection Liquid line	Inches (mm)	1/4 (6.35)	
Refrigerant connection Suction pipe	Inches (mm)	3/8 (9.52)	
Dimensions: H/W/D	mm	554/800/333	
Weight	kg	36.4	
EDP no.		1623751	1623761

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

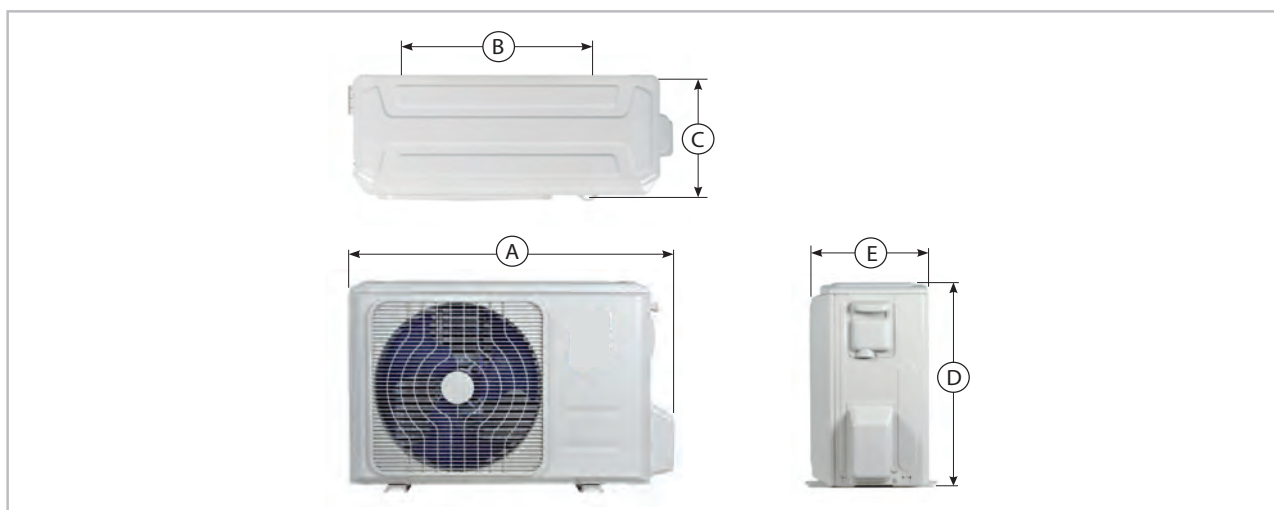
⁴⁾ The specified value is based on the average heating period

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")

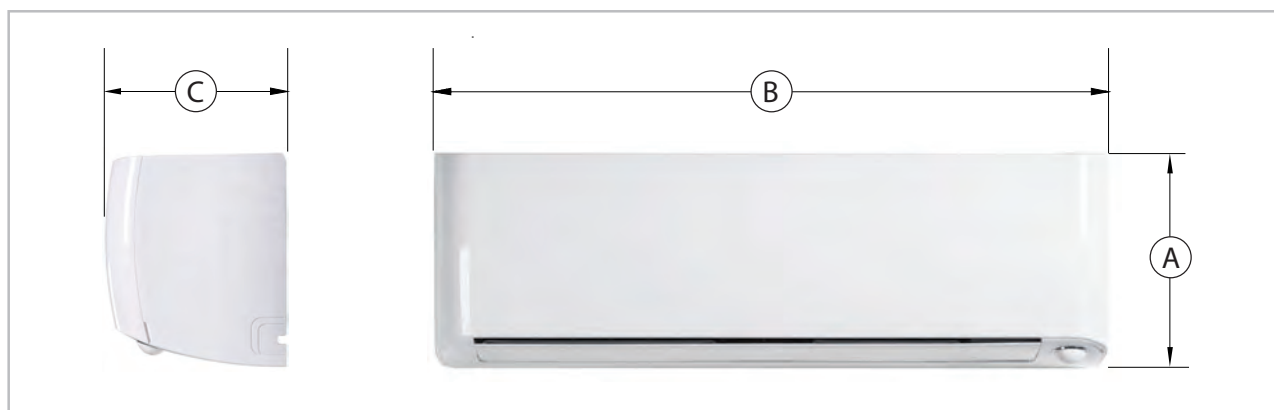
2.2 Unit dimensions

Outdoor units



Measurements (mm)	A	B	C	D	E
RVT 265-355 DC AT	800	487	333	554	300

Indoor units



Measurements (mm)	A	B	C
RVT 265-355 DC	298	895	248

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

REMKO RVT series

2.3 Performance data

Cooling capacity RVT 265 DC

Inside		Outside temperature (TK, °C)								
		20			25			30		
		Cooling capacity (A = Total, B = Sensitive, C = Power consumption)								
TK	FK	A	B	C	A	B	C	A	B	C
°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW
20	14	2.71	2.11	0.37	2.59	2.07	0.40	2.48	2.03	0.43
22	16	2.85	2.18	0.37	2.73	2.14	0.40	2.61	2.10	0.44
25	18	3.00	2.25	0.37	2.87	2.21	0.41	2.74	2.17	0.44
27	19	3.06	2.27	0.38	2.93	2.23	0.41	2.80	2.18	0.44
30	22	3.28	2.38	0.38	3.14	2.34	0.41	2.99	2.29	0.45
32	24	3.40	2.43	0.38	3.25	2.39	0.42	3.11	2.35	0.45

Inside		Outside temperature (TK, °C)					
		35			40		
		Cooling capacity (A = Total, B = Sensitive, C = Power consumption)					
TK	FK	A	B	C	A	B	C
°C	°C	kW	kW	kW	kW	kW	kW
20	14	2.33	1.96	0.47	2.29	1.97	0.50
22	16	2.46	2.03	0.48	2.41	2.04	0.51
25	18	2.59	2.10	0.48	2.54	2.10	0.51
27	19	2.64	2.11	0.48	2.59	2.12	0.52
30	22	2.82	2.22	0.49	2.77	2.23	0.52
32	24	2.93	2.27	0.49	2.87	2.28	0.52

Heating capacity RVT 265 DC

Inside	Outside temperature (TK, °C)							
	-25		-20		-15		-10	
	Heating capacity (A = Total, B = Sensitive, C = Power consumption)							
TK	A	C	A	C	A	C	A	C
°C	kW	kW	kW	kW	kW	kW	kW	kW
15	2.62	1.58	2.98	1.64	3.59	1.66	3.76	1.57
18	2.58	1.60	2.94	1.67	3.54	1.68	3.71	1.59
20	2.54	1.63	2.89	1.69	3.49	1.71	3.65	1.62
22	2.49	1.64	2.83	1.71	3.42	1.73	3.58	1.63
24	2.47	1.66	2.81	1.73	3.38	1.74	3.54	1.65
25	2.44	1.67	2.78	1.74	3.35	1.75	3.51	1.66
27	2.42	1.68	2.75	1.75	3.31	1.77	3.47	1.67

Inside	Outside temperature (TK, °C)							
	-7		2		7		10	
	Heating capacity (A = Total, B = Sensitive, C = Power consumption)							
TK	A	C	A	C	A	C	A	C
°C	kW	kW	kW	kW	kW	kW	kW	kW
15	3.85	1.51	4.14	1.50	4.23	0.81	4.01	0.73
18	3.79	1.54	4.08	1.53	4.16	0.82	3.96	0.74
20	3.73	1.56	4.02	1.55	4.10	0.83	3.90	0.75
22	3.66	1.58	3.94	1.57	4.02	0.84	3.82	0.76
24	3.62	1.59	3.90	1.58	3.98	0.85	3.78	0.77
25	3.58	1.60	3.86	1.59	3.94	0.85	3.74	0.77
27	3.55	1.61	3.82	1.61	3.90	0.86	3.70	0.78

REMKO RVT series

Cooling capacity RVT 355 DC

Inside		Outside temperature (TK, °C)								
		20			25			30		
		Cooling capacity (A = Total, B = Sensitive, C = Power consumption)								
TK	FK	A	B	C	A	B	C	A	B	C
°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW
20	14	3.55	2.77	0.57	3.41	2.72	0.62	3.26	2.67	0.67
22	16	3.73	2.86	0.58	3.59	2.81	0.63	3.43	2.76	0.68
25	18	3.93	2.95	0.58	3.77	2.91	0.63	3.61	2.85	0.69
27	19	4.01	2.97	0.59	3.85	2.93	0.64	3.68	2.87	0.69
30	22	4.29	3.11	0.59	4.12	3.07	0.64	3.94	3.01	0.70
32	24	4.45	3.18	0.59	4.27	3.14	0.65	4.09	3.08	0.70

Inside		Outside temperature (TK, °C)					
		35			40		
		Cooling capacity (A = Total, B = Sensitive, C = Power consumption)					
TK	FK	A	B	C	A	B	C
°C	°C	kW	kW	kW	kW	kW	kW
20	14	3.11	2.61	0.73	3.02	2.59	0.78
22	16	3.27	2.70	0.74	3.18	2.68	0.79
25	18	3.45	2.79	0.75	3.34	2.77	0.80
27	19	3.52	2.81	0.75	3.41	2.80	0.80
30	22	3.76	2.96	0.76	3.65	2.94	0.81
32	24	3.90	3.03	0.76	3.79	3.01	0.81

Heating capacity RVT 355 DC

Inside	Outside temperature (TK, °C)							
	-25		-20		-15		-10	
	Heating capacity (A = Total, B = Sensitive, C = Power consumption)							
TK	A	C	A	C	A	C	A	C
°C	kW	kW	kW	kW	kW	kW	kW	kW
15	2.76	1.83	3.02	1.92	3.72	1.95	3.90	1.89
18	2.72	1.86	2.98	1.95	3.67	1.98	3.84	1.92
20	2.68	1.89	2.93	1.98	3.61	2.01	3.78	1.95
22	2.62	1.90	2.87	2.00	3.54	2.03	3.71	1.97
24	2.60	1.92	2.84	2.02	3.50	2.05	3.67	1.99
25	2.57	1.93	2.82	2.03	3.47	2.06	3.63	2.00
27	2.54	1.95	2.79	2.05	3.43	2.08	3.59	2.02

Inside	Outside temperature (TK, °C)							
	-7		2		7		10	
	Heating capacity (A = Total, B = Sensitive, C = Power consumption)							
TK	A	C	A	C	A	C	A	C
°C	kW	kW	kW	kW	kW	kW	kW	kW
15	4.42	1.88	4.60	1.88	4.38	0.91	4.16	0.82
18	4.36	1.91	4.53	1.90	4.31	0.93	4.10	0.84
20	4.29	1.94	4.46	1.93	4.25	0.94	4.04	0.85
22	4.21	1.96	4.37	1.95	4.17	0.95	3.96	0.86
24	4.16	1.98	4.33	1.97	4.12	0.96	3.92	0.87
25	4.12	1.99	4.28	1.98	4.08	0.97	3.88	0.87
27	4.08	2.01	4.24	2.00	4.04	0.98	3.84	0.88

REMKO RVT series

3 Design and function

3.1 Characteristics of REMKO inverter air conditioner with split design

REMKO inverter technology

The air conditioner's condenser is equipped with a requirement-dependent speed control system. The power control on conventional air conditioners provides only two states, either ON (full output) or OFF (no output). The air conditioner turns on below a specified temperature and turns off when this temperature is reached. This kind of heat regulation is very inefficient. Heat regulation in the Remko inverter air conditioner is modulated to the actual need. The electronics system has an integrated frequency-converter which serves to modify the condenser speed and the speed of the blower as required. The condenser works at a higher

speed when under full load than under partial load. The lower speeds ensure a longer operational life-time for the components, improved coefficient of performance and lower noise. Lower speeds also result in lower energy consumption (electricity) and longer service life. I.e.: inverter air conditioner will run practically throughout the cooling season. In all, the highest efficiency possible.



Thanks to innovative inverter technology, this air conditioner will almost always operate by adapting its cooling capacity to the actual requirements of the cooling season, and will in fact turn itself off when heat is removed. The same applies in the opposite direction with heating.

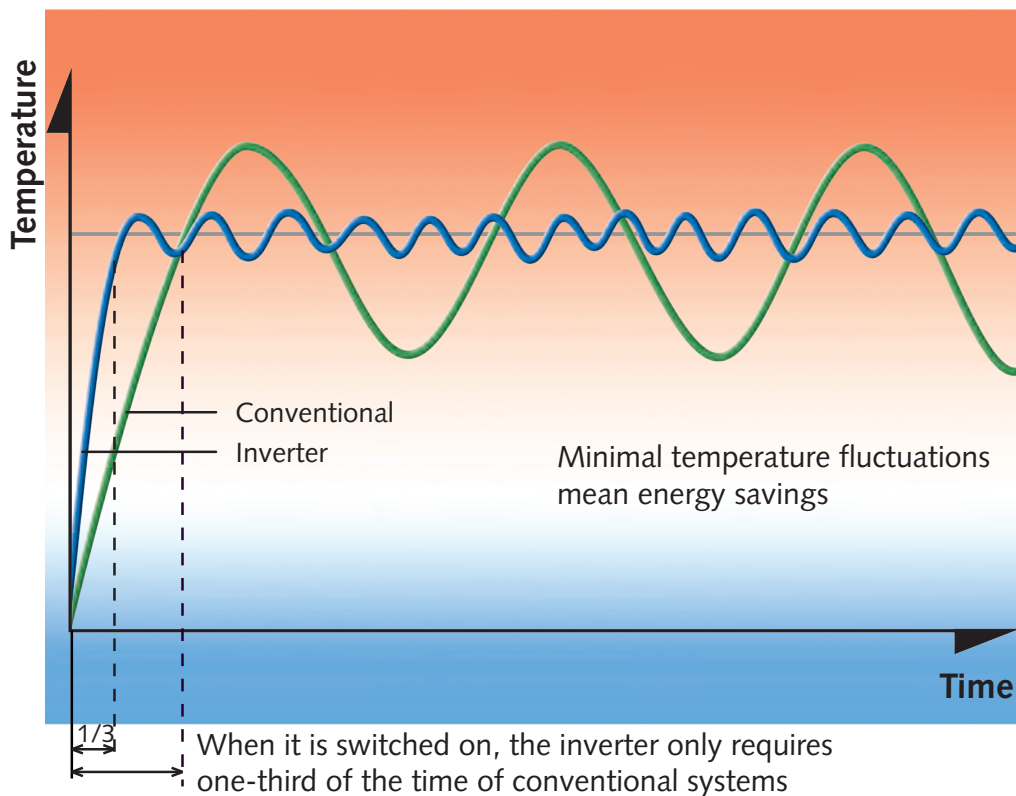


Fig. 1: Modern inverter technology

Cooling mode

Because of circuit reversal, heating is also possible. In heating mode, the components of the refrigeration circuit are used to produce warm air thus in the building can be heated.

The comfort zone in the illustration below shows which values for temperature and humidity are considered comfortable for people. This range should ideally be met when heating or air-conditioning buildings.

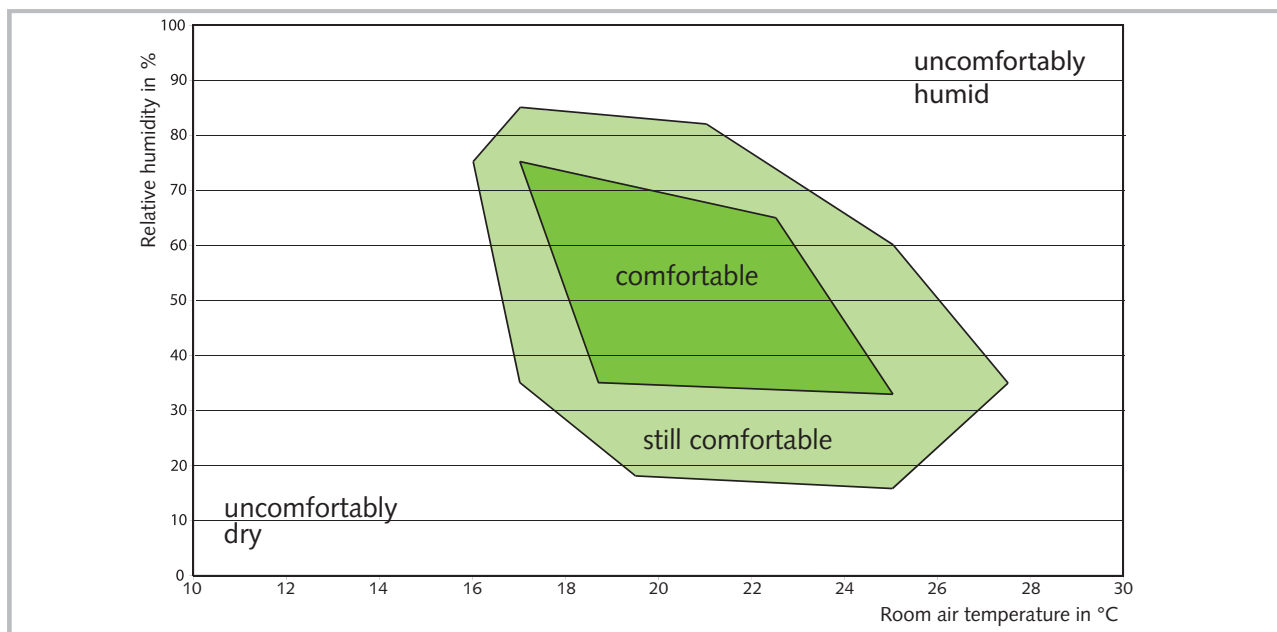


Fig. 2: Comfort zone

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3.2 Unit description

The RVT series room air conditioners have a REMKO RVT...AT outdoor unit as well as an RVT...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 indoor unit is designed to be mounted high up on the wall, in indoor areas. It is operated by an infrared remote control.

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 consists of a fin evaporator, evaporator fan, controller and condensate tray.

Floor brackets, wall brackets, refrigerant piping and condensate pumps are available as accessories.

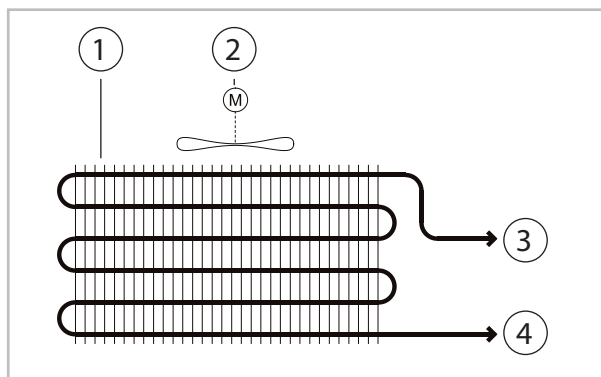


Fig. 3: Cooling cycle diagram for indoor unit

- 1: Evaporator
- 2: Evaporator fan
- 3: Suction pipe connection
- 4: Injection pipe connection

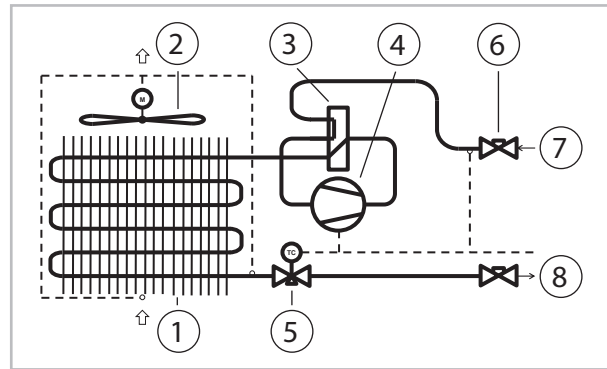


Fig. 4: Cooling cycle diagram for outdoor unit

- 1: Condenser
- 2: Condenser fan
- 3: Reversing valve
- 4: Compressor
- 5: Capillary tube injection
- 6: Pressure gauge connection
- 7: Suction pipe connection valve
- 8: Injection pipe connection valve

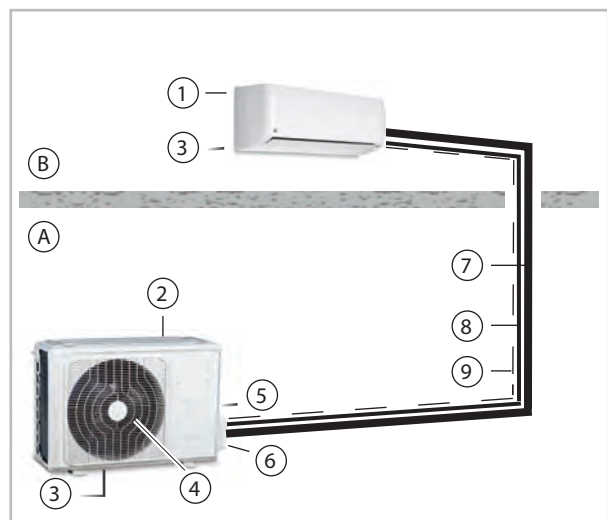


Fig. 5: System layout

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

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

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.

Manual mode

The indoor unit can also be switched on manually if the infrared remote control is lost/defective. Manual operation is intended for emergency operation and is not suitable for basic unit operation. Please replace the remote control. The key for manual activation is located on the right side of the unit.

The following settings apply for manual operation:

Pressing once: Automatic mode,

Pressing twice: Cooling mode,

Pressing three times: Unit OFF

Infrared remote control

The infrared remote control sends the programmed settings a distance of up to 8 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. 6: Maximum distance



Alarms are indicated by a code (see chapter Troubleshooting and customer service).

! NOTICE!

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



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

4.2 Indicators on indoor unit



1: Display of coded error message and target temperature

If the display shows "CL", the filters must be cleaned immediately.

If the display shows "nF", the filters must be replaced. Press LED key 4 after carrying out the work to deactivate the reminder functions.

REMKO RVT series

4.3 Keys on the remote control

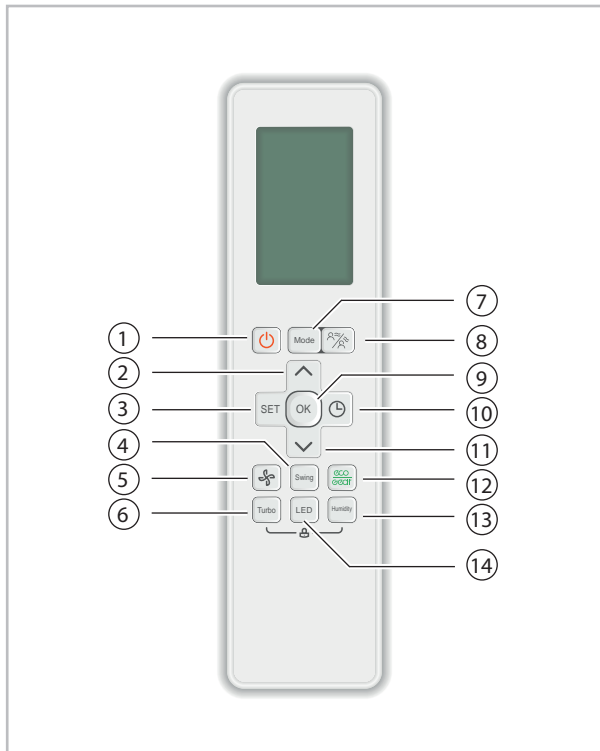


Fig. 7: Keys on the remote control

① "ON/OFF" key

Switches the air conditioning unit on or off.

② "Arrow up" key

Increases the temperature setpoint in 0.5 °C increments up to the maximum setting value of 30 °C.

With the humidity function activated:

Increases the humidity setpoint in 5 % increments up to the maximum setting value of 85 %.

③ "SET" key

Cycles through the various additional functions at the top of the screen in the following order:

- 👁 Intelligent Eye
- ✳ Self clean
- 🍃 Fresh (ion generator)
- 🌙 Sleep
- 👤 Follow me
- 🚫 Not available

④ "Swing" key

Pressing briefly starts and stops the horizontal fin movement.

Pressing the key for 2 seconds starts and stops the vertical fin movement.

⑤ "Fan speed" key

Switches between the different fan speeds in the following order:

AUTO ⇒ 20% ⇒ 40% ⇒ 60% ⇒ 80% ⇒ 100% ⇒ ...

The fan speed can also be adjusted in 1% steps with the "Arrow up" and "Arrow down" keys.

Pressing and holding the key activates the silence function.

⑥ "Turbo" key

Activates or deactivates the turbo function to reach the setpoint as quickly as possible.

⑦ "Mode" key

Switches between the available operating modes in the following order:

AUTO ⇒ COOL ⇒ DRY ⇒ HEAT ⇒ FAN ⇒ ...

AUTO: Automatic mode

COOL: Cooling

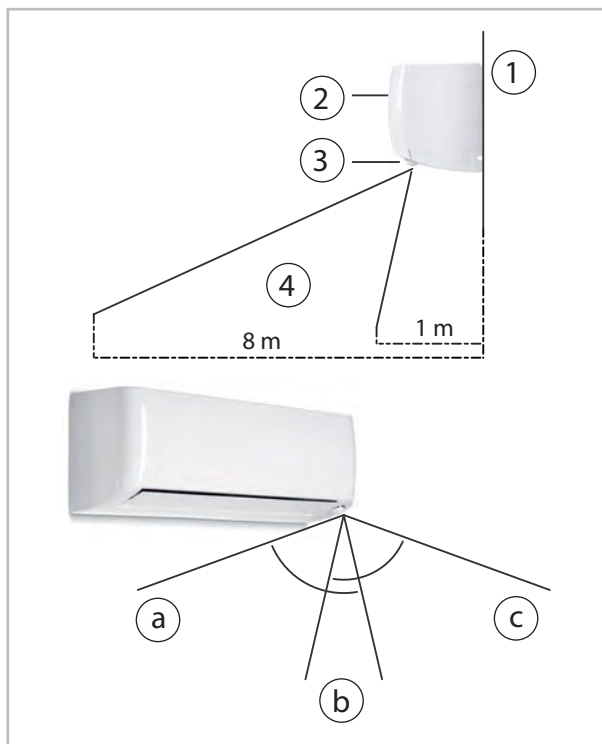
DRY: Dehumidification

HEAT: Heating

FAN: Recirculation mode

⑧ "Airflow redirection" key

Activates the automatic wind direction reversal. The unit directs the airflow to a person detected in the room when the function is activated. By pressing the key again, the unit directs the airflow away from the person. The fan flaps remain in the current position. Pressing the key repeatedly deactivates this function. Note: If there are two or more persons/moving objects within the acquisition range of the Intelligent eye, this function cannot be used.



- 1: Wall
- 2: Indoor unit
- 3: Intelligent eye
- 4: Acquisition range
- a: Left - $75^\circ \pm 10^\circ$
- b: Centre - $30^\circ \pm 10^\circ$
- c: Right - $75^\circ \pm 10^\circ$

⑨ "OK" key

Activates or deactivates a previously selected additional function.

⑩ "Timer"

Activates or deactivates the switch-on or switch-off delay.

⑪ "Arrow down" key

Reduces the temperature setpoint in 0.5°C increments up to the minimum setpoint. Setting value of 16°C .

With the humidity function activated:

Reduces the humidity setpoint in 5 % increments up to the minimum setpoint. Setting value of 35 %.

⑫ "eco gear" key

Switches between the available energy-saving functions in the following order:

eco \Rightarrow gear 75 % \Rightarrow gear 50 % \Rightarrow OFF \Rightarrow eco ...

eco:

the setpoint is raised to 24°C and the fan speed is set to automatic. If the setpoint is higher than 24°C before the eco function is activated, the setpoint is not changed.

If a setpoint of $< 24^\circ\text{C}$ is set, the eco function is deactivated.

gear 75 %:

inducts the power consumption to max. 75 %.

gear 50 %:

inducts the power consumption to max. 50%

⑬ "Humidity" key

Switches the control variable from room temperature to relative humidity in "Dehumidification" operating mode.

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⑭ "LED" key

Deactivates or activates the illumination of the LED display and the signal tones of the indoor unit.

Indicators on the LCD

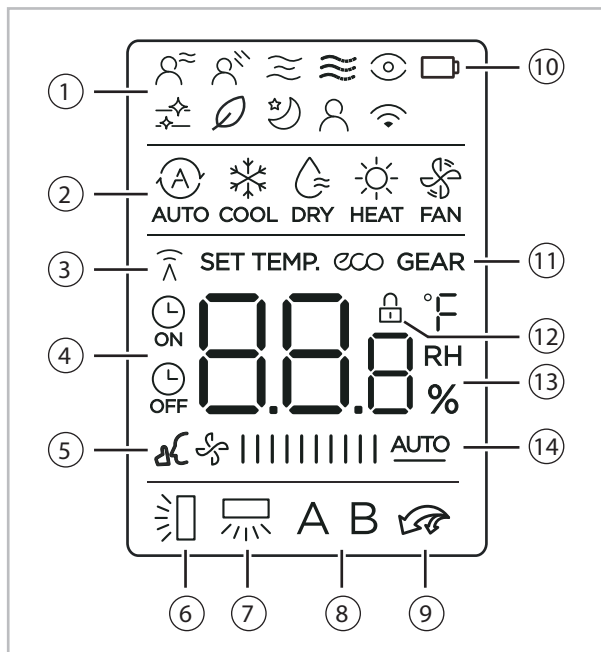


Fig. 8: Indicators on the LCD

① Additional functions

Displays the active additional functions.

② Operating mode

Indicates the active operating mode.

③ TIMER OFF symbol

This symbol appears when TIMER OFF is switched on.

③ Data transmission

Appears when data is transmitted from the infrared remote control to the indoor unit.

④ Timer

Displays the corresponding symbol when the switch-on delay (ON) or switch-off delay (OFF) is activated.

⑤ Silence

Appears when the silence function is active.

⑥ Horizontal swing function

Shows the position or the activated swing function of the horizontal swing slat.

⑦ Vertical swing function

Displays the position or the activated swing function of the vertical swing slats.

⑧ Not available

⑨ Turbo mode

Appears when turbo mode is activated.

⑩ Battery indicator

Indicates the remaining capacity of the remote control battery.

⑪ eco gear

Appears when the eco gear function is activated.

⑫ Key lock

Appears when the remote control key lock is active.

⑬ Temperature indicators

Displays the setpoint for the temperature setting (16 °C - 30 °C) or the relative humidity (35 % - 85 %).

⑭ Fan speed symbol

This is where the selected fan speeds are displayed: AUTO and the five fan speed settings. The fan speed is set to "Automatic" when either "Auto" or "Dehumidification" mode is activated.



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

"Auto" 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 **"ON/OFF"** key [1] to switch on the air conditioning unit.
2. ➤ Press the **"MODE"** key [2] to select "Auto" mode.
3. ➤ Press the **"Arrow up / Arrow down"** key [3] to set the desired temperature. The temperature can be set to between 16 °C - 30 °C, in increments of 1 °C.

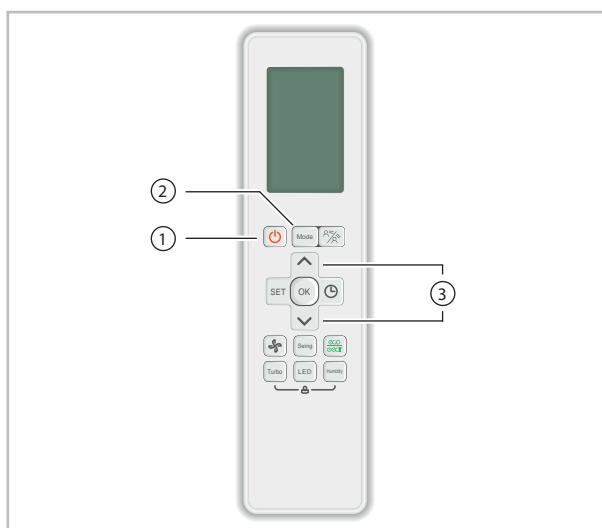


Fig. 9: "Auto" mode

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

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

1. ➤ Press the **"ON/OFF"** key [1] to switch on the air conditioning unit.
2. ➤ Press the **"MODE"** key [2] to select "Cooling", "Heating" or "Recirculation" mode.
3. ➤ Press the **"Arrow up / Arrow down"** key [3] to set the desired temperature. The temperature can be set to between 16 °C - 30 °C, in increments of 0.5 °C.
4. ➤ Press the **"FAN"** key [4] to set the desired fan stage.

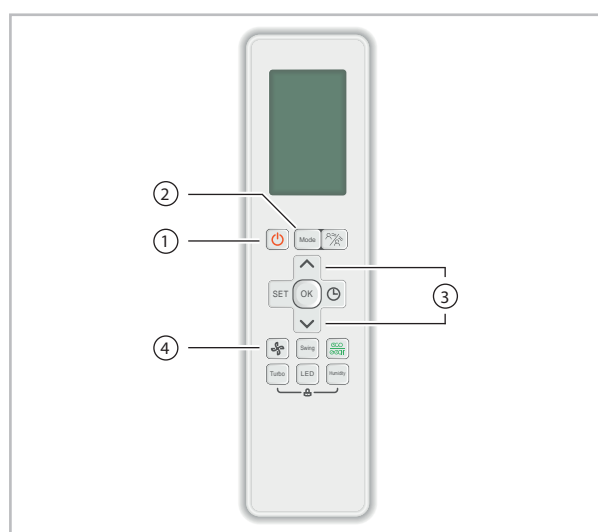


Fig. 10: "Cooling", "Heating" and "Recirculation" mode

REMKO RVT series

"Dehumidification" mode

1. Press the **"ON/OFF"** key [1] to switch on the air conditioning unit.
2. Press the **"MODE"** key [2] to select "Dehumidification" mode.
3. Press the **"Humidity"** key [4] to set the unit of the controlled variable to relative humidity (RH).
4. Press the **"Arrow up / Arrow down"** key [3] to set the desired relative humidity. The set-point can be adjusted between 35 and 85 % in 5 % increments.

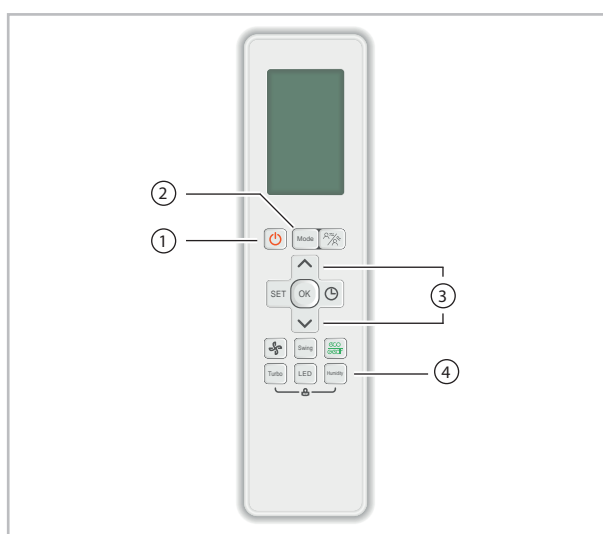


Fig. 11: "Dehumidification" mode



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"** key to set the "switch-on time" and the "switch-off time" for the unit.

Setting the "switch-on time"

The air conditioning unit has two different timer modes:

Timer ON determines the time after which the unit automatically switches itself on.

Timer OFF determines the time after which the unit automatically switches itself off.

Activate the "Timer on" function by pressing the Timer key [1]. The Timer ON symbol now appears on the display. Use the "Arrow up" and "Arrow down" keys [2] to select the desired switch-on time. The function activates itself after one second.

The target temperature and the Timer ON symbol now appear on the display again as confirmation of the function.

Activate the "Timer OFF" function by pressing the Timer key [1] twice. The "Timer OFF" symbol now appears on the display.

Use the "Arrow up" and "Arrow down" keys [2] to select the desired switch-off time. The function activates itself after one second.

The temperature and the Timer ON symbol now appear on the display again as confirmation of the function.

Both functions can also be used together. For example, if the unit is to switch on in 6 hours and switch off two hours later, proceed as follows:

Press the Timer key [1] and ensure that the Timer ON symbol illuminates. Press the "Arrow up / Arrow down" keys [2] until "6.0h" appears on the display. Now press the Timer key [1] again. The Timer OFF symbol should appear on the display. Use the "Arrow up / Arrow down" keys [2] to set the time to 8.0h and then wait one second for the functions to activate themselves automatically.

Times which have already been set can be changed. To do this, select either Timer ON or Timer OFF mode and change the time using the "Arrow up / Arrow down" keys [2]. Please note that this delay is then activated from the current point in time, not the point in time when the original programming took place!

Delays which have already been programmed can be deactivated by reducing the time to 0.0h in the respective menu (Timer ON or Timer OFF).



When the switch-on and switch-off times are being set, this can be done at 30 minute intervals for the first 10 hours, and at hourly intervals thereafter. The maximum switch-on or switch-off delay is 24 hours.

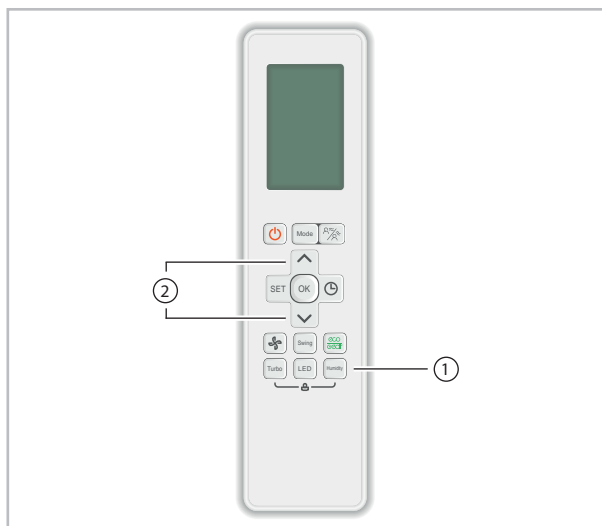


Fig. 12: "Timer" mode



- 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.

Examples of 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.

- Press the "TIMER" key. 0.0h and the "Timer ON" symbol now appear on the display.
- Press the "Arrow up" or "Arrow down" key until the desired start time appears in the "TIMER ON" area of the remote control.
- 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.

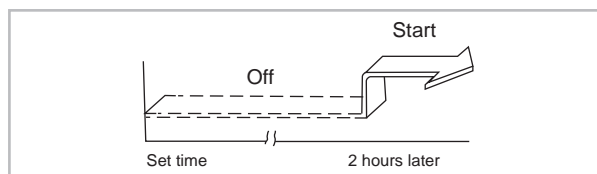


Fig. 13: "TIMER ON" example

"TIMER OFF" (Auto off mode)

Example:

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

- Press the "TIMER" key twice. 0.0h and the "Timer OFF" symbol now appear on the display.
- Press the "Arrow up" or "Arrow down" key until "4h" appears in the "TIMER OFF" area of the remote control.
- 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.

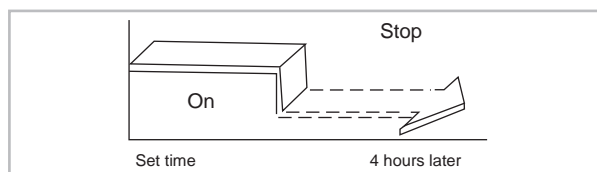


Fig. 14: "TIMER OFF" example

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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" key.
2. Press the "Arrow up" or "Arrow down" key until "10h" appears on the display.
3. Press the "TIMER" key.
4. Press the "Arrow up" or "Arrow down" key until "2h" is displayed.
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.

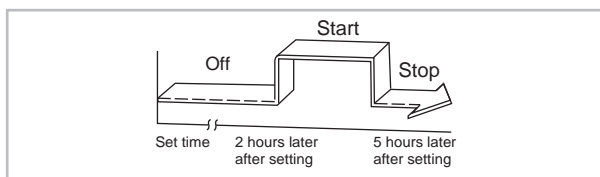


Fig. 15: "TIMER OFF"/"TIMER ON" example

Additional functions

With the "Set" key [1], the following additional functions can be activated when the unit is switched on:

Intelligent Eye

If this function is activated, the unit monitors the presence of people in the room with the help of the motion sensor. If there is no person in the room for 30 minutes, the energy saving function is activated and the compressor frequency is automatically reduced. As soon as a person enters the room, the energy-saving function is deactivated again.

Self Clean

When the Self Clean function is activated, the indoor unit automatically cleans the heat exchanger to prevent mould and odour formation. The cleaning process can take up to 45 minutes. "CL" is shown on the unit display during the process.

BioClean

When the BioClean function is activated, negatively charged ions are added to the airflow to bind the particles contained in the air. The bundled particles then fall to the ground and can be filtered out of the air more easily.

Sleep

The sleep function can be used to save energy during night operation. When the sleep function is activated, the temperature setpoint is regularly reduced (cooling mode) or increased (heating mode).

Follow me

The "Follow me" function activates the temperature detection of the infrared remote control. The actual temperature is then transmitted to the indoor unit every 3 minutes. Note: In order for the temperature to be transmitted by the infrared remote control at all times, there must be visual contact between the infrared remote control and the indoor unit at all times.

AP function

Function not available

The desired function can then be selected with the "Arrow up / Arrow down" keys [2] and confirmed with the "OK" key [3].

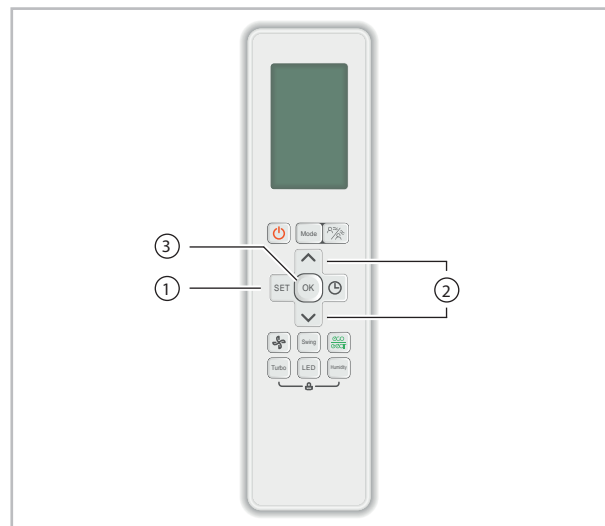


Fig. 16: Additional functions

Frost protection function

The frost protection function keeps the room air temperature above 8°C to prevent damage to the building structure.

1. ➤ Press the **"ON/OFF"** key [1] to switch on the air conditioning unit.
2. ➤ Press the **"MODE"** key [2] to select "Heating" mode.
3. ➤ Press the **"Arrow down"** key [3] until the temperature setpoint is at 16 °C. Then press the **"Arrow down"** key [3] twice within one second to activate the frost protection function

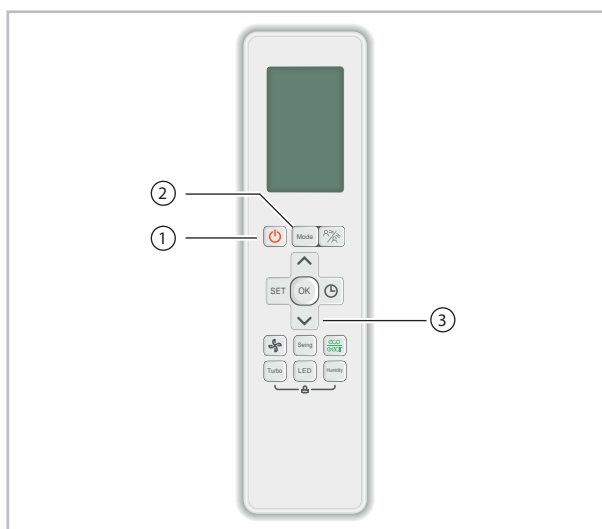


Fig. 17: Frost protection function

Key lock

The frost protection function keeps the room air temperature above 8°C to prevent damage to the building structure.

- Press the **"Turbo"** key [1] and the **"Humidity"** key [2] at the same time for 5 seconds to activate and deactivate the key lock.

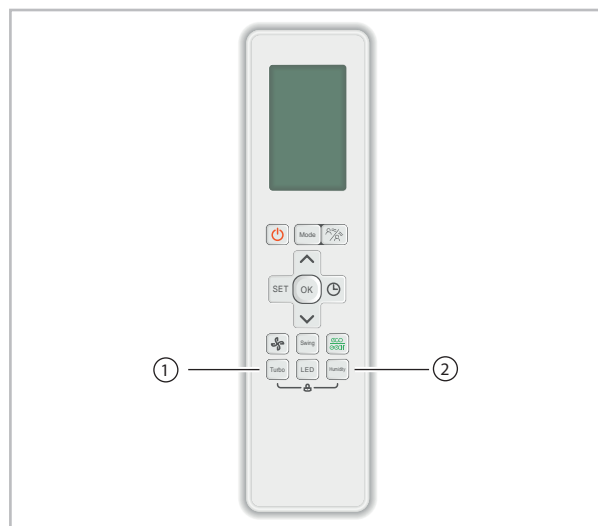


Fig. 18: Activate / deactivate key lock

REMKO RVT series

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 (liquid and suction pipe), valves and connections must be insulated to make them vapour diffusion proof. 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.
- Make special preparations regarding the oil return if the outdoor unit is located above the indoor unit (see section "Oil return measures").
- Add refrigerant if the basic length of the refrigerant piping exceeds 5 metres. For the quantity of additional refrigerant, refer to chapter "Adding refrigerant".
- Perform all electrical wiring in accordance with applicable DIN and VDE standards.
- Ensure the electrical cables are properly connected to the terminals, otherwise there is a risk of fire.
- Use four supports and the associated hooks to attach the ceiling cassette (only applies to ceiling cassettes).
- 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!

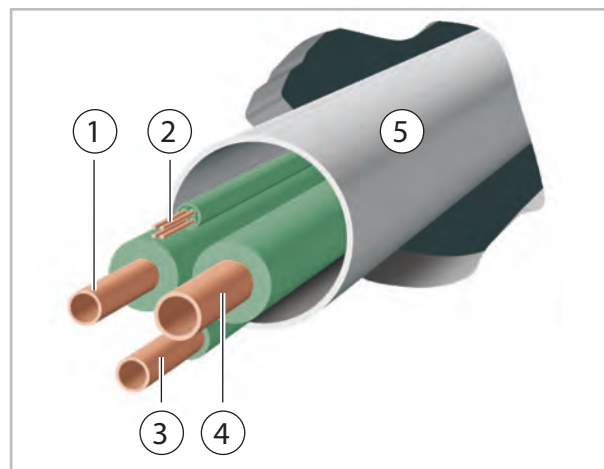


Fig. 19: Wall opening

- 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 to the wall by a wall bracket and 4 screws (to be 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.

5.4 Layout, indoor unit

The indoor unit is designed for horizontal wall installation above doors. However, it can also be used in the upper wall area (min. 2.0 m above the floor).

The minimum room size must be 4 m².

This varies according to the total fill quantity of the system. Observe the valid DIN standards for the calculation!

5.5 Installation, mounting outdoor unit

Outdoor unit installation location

- The device may be attached only to a load-bearing structure or wall. Ensure that the outdoor unit is installed only vertically. The installation site should be well ventilated.
- To minimise noise, install floor consoles with vibration dampers and a considerable distance from acoustically-reflective walls to minimise noise.
- The minimum clearances specified on the next page should be maintained when carrying out the installation. These minimum distances serve to ensure unrestricted air intake and exhaust. Additionally, there must be adequate space available for installation, maintenance and repair.
- If the outdoor unit is erected in an area of strong winds, then the device must be protected against them (Fig. 20). The snow line is to be observed during installation (Fig. 21).
- The outdoor unit must always be installed on vibration dampers. Vibration dampers prevent the transmission of vibrations through the floor or walls.
- A heated, condensate tray ensures that condensation from the pan can drain off. Ensure that the condensate is prevented from freezing so that it can drain off (gravel, drainage). The Water Ecology Act is to be observed.
- The outdoor unit must always be installed outdoors. Do not install the outdoor unit in enclosed rooms, including basement and window shafts.
- During installation, add about 20 cm to the expected snow depth to guarantee unimpeded intake and exhaust of outdoor air year round (Fig. 21).
- The installation site of the outdoor unit should be agreed together with the operator primarily so that operating noise is minimised and not in terms of "short routes". Thanks to the split-design technology there are a great deal of different installation options with almost identical efficiency available.

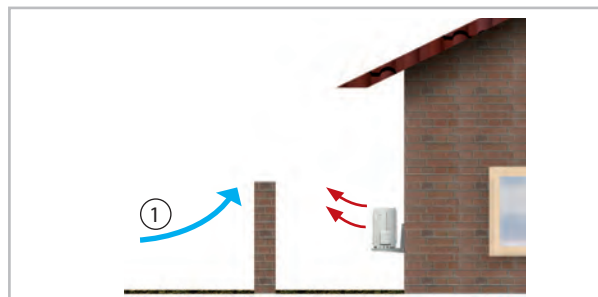


Fig. 20: Protection from wind

1: Wind

! NOTICE!

The site for the outdoor unit must be selected so that machinery noise that occurs disturbs neither the residents nor the facility operator. Observe the TA-noise specifications as well as the table containing the drawings relating to sound pressure levels..

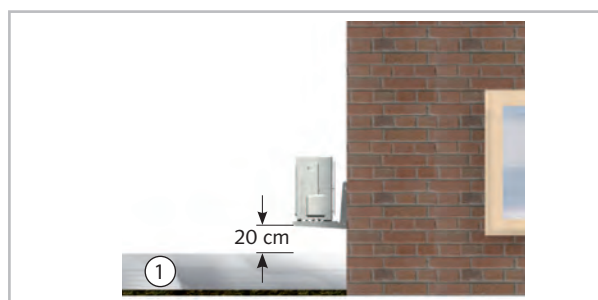


Fig. 21: Protection from snow

1: Snow

REMKO RVT series

Point of emissions	Assessment level in accordance with TA noise	
	days in dB(A)	nights in dB(A)
Industrial areas	70	70
Commercial areas	65	50
Core areas, village areas and mixed zones	60	45
General residential areas and small housing estates	55	40
Exclusively residential areas	50	35
Spa areas, hospitals and mental institutions	45	35

Isolated noise peaks of short duration may not exceed 30 dB(A) during the day and 20 dB(A) at night.

Definition of the Danger Area



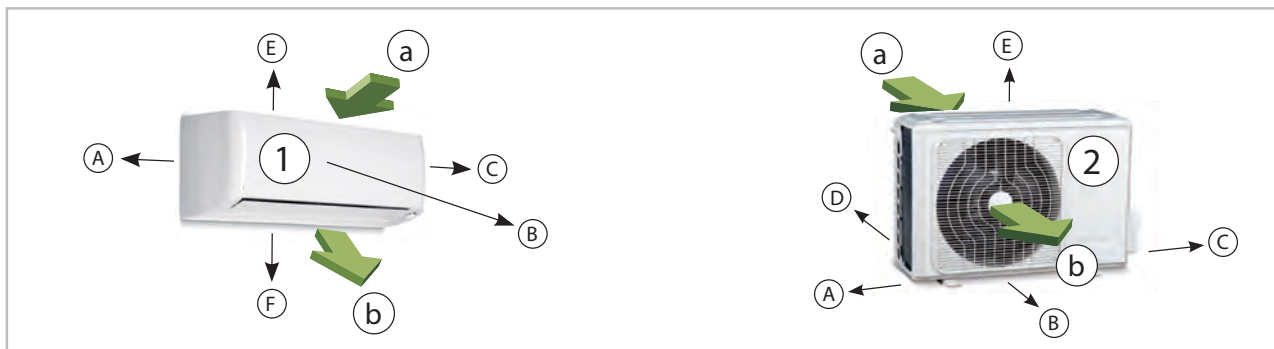
WARNING!

Access to the unit is only permitted for authorised and trained persons. If unauthorised persons can approach the danger areas, these areas must be identified with corresponding signs, barriers, etc.

- The external danger area surrounds the equipment up to a distance of 2 m, measured in all directions from the unit housing.
- The external danger area on-site can differ as a result of the setup. The specialist company performing the installation work bears the responsibility for this.
- The internal danger area is located inside the machine and can only be reached with the use of an appropriate tool. Access is prohibited for unauthorised persons!

5.6 Minimum clearances

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



1: Indoor unit (IT)
2: Outdoor unit (AT)

a: Air inlet
b: Air outlet

	Measurements (mm)					
	A	B	C	D	E	F
RVT 265-355 DC IT	120	1500	120	-	150	2000
RVT 265-355 DC AT	300	2000	600	300	600	-

5.7 Connection variants for the indoor unit

The following connection variants can be used for the refrigerant, condensate and control lines.

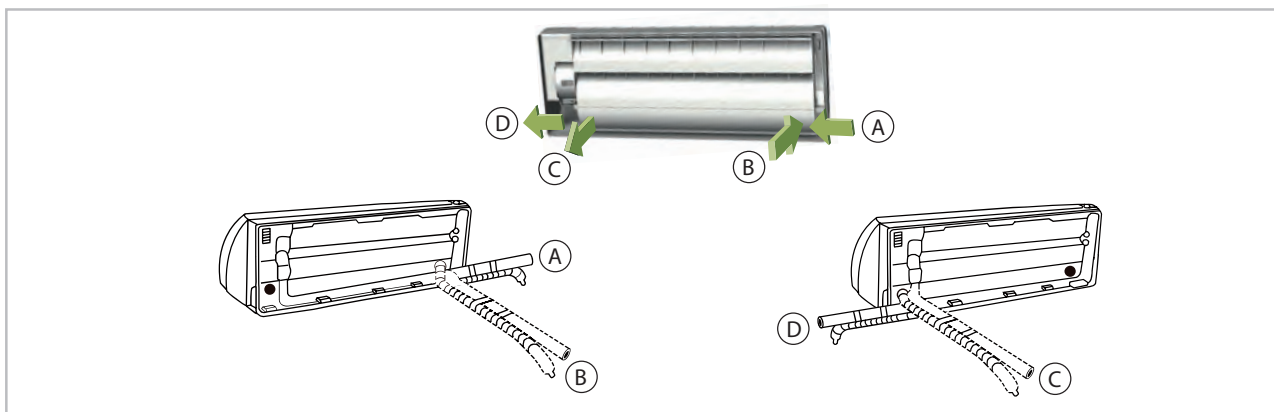


Fig. 22: Connection variant (view from the rear)

A: Infeed of the refrigerant piping at the wall, left
B: Infeed of the refrigerant piping through the wall, left

C: Outlet through the wall, right
D: Outlet at the wall, right (the refrigerant piping must be bent through 180 degrees for this)

! NOTICE!

A flare connection may only be established outside the room. Detachable, reusable connections are not permissible inside!

REMKO RVT series

5.8 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.

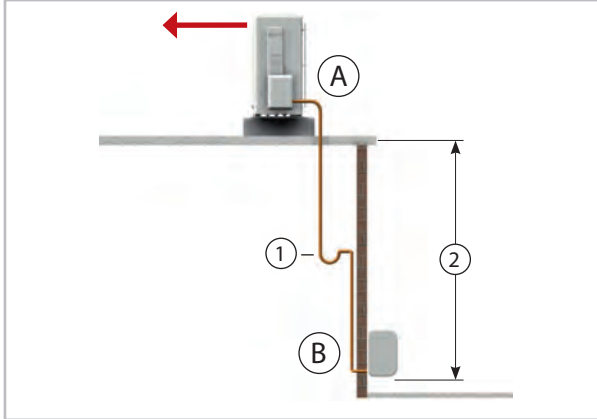


Fig. 23: Oil return measures

- A: Outdoor unit
- B: Indoor unit
- 1: One oil pump bend in suction pipe to outdoor unit every 7 metres of height difference, radius: 50 mm
- 2: Max. 20 m

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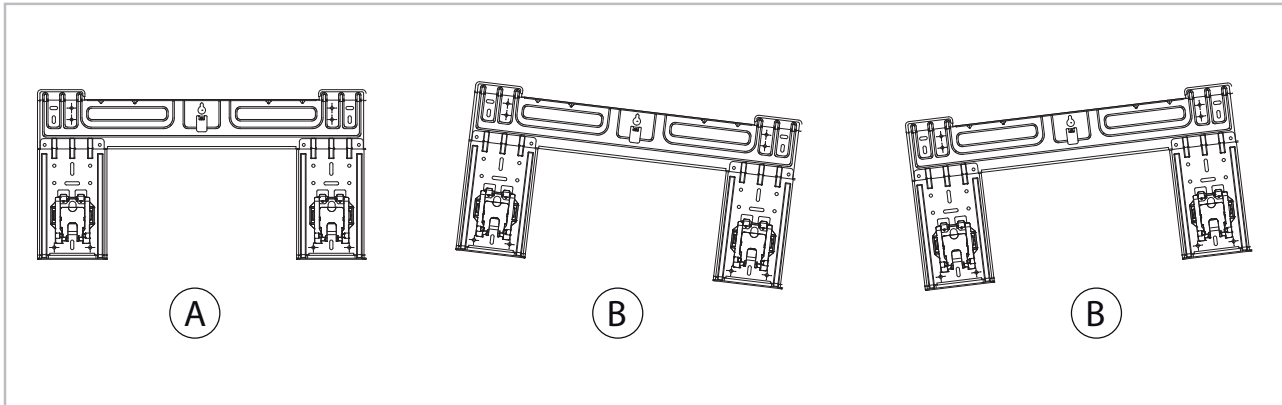


Fig. 26: Wall bracket alignment RVT 265-355 DC

A: Correct alignment

B: Incorrect alignment

6 Installation

6.1 Installation of the indoor unit

The indoor unit is attached by means of a wall bracket, taking into consideration the air outlet side located in the lower part.

1. ➤ Mark the mounting points on the structurally permissible building sections according to the dimensions of the wall bracket.
2. ➤ If necessary, remove the break out opening of the housing.
3. ➤ Connect the refrigerant piping, electrical cables and condensate drainage line to the indoor unit as described below.
4. ➤ Hang the indoor unit onto the wall bracket by tilting it back slightly and by pressing the bottom part of the unit against the bracket.
5. ➤ Check again that the unit is level. (Fig. 27)

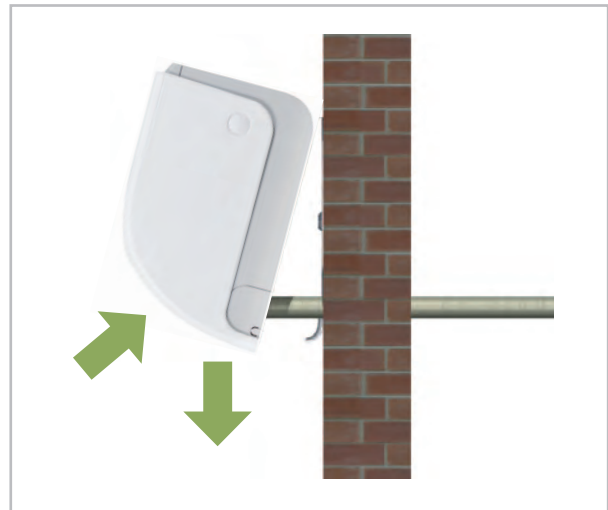


Fig. 27: Horizontal positioning

The wall bracket for the units must be attached with suitable screws and anchors.

6.2 Connecting the refrigerant piping

The refrigerant piping is connected (responsibility of the customer) on the back side of the units.

Please note that a flare connection is only permissible outside the enclosed room. If this is not possible on site, the connection of the indoor unit must be established as a permanent connection (e.g. soldered).

It may be necessary to fit a reducer or flared adapter to the indoor unit. These fittings are included with the indoor unit as an accessory kit. Once installed, the connections should be insulated to make them vapour diffusion proof.

! NOTICE!

Installation should only be performed by authorised specialists.

! NOTICE!

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

! 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!

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 pipings as shown below (Fig. 28 and Fig. 29).
9. ➤ Verify that the shape of the flange is correct (Fig. 30).
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 one spanner to counter the force when tightening the fitting (Fig. 31).
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.

REMKO RVT series



Label the refrigerant piping (injection and suction pipes) as well as the associated electrical control lines of each interior unit with a letter. Only connect the lines to their associated connections.

! NOTICE!

Always pay attention to the affiliation of the electrical lines and refrigerant piping! The connections of the individual circuits must not be mixed up. Mixing up the assignment of control lines and refrigerant piping can have fatal consequences (compressor damage)!

Commissioning of the individual circuits must be carried out successively.

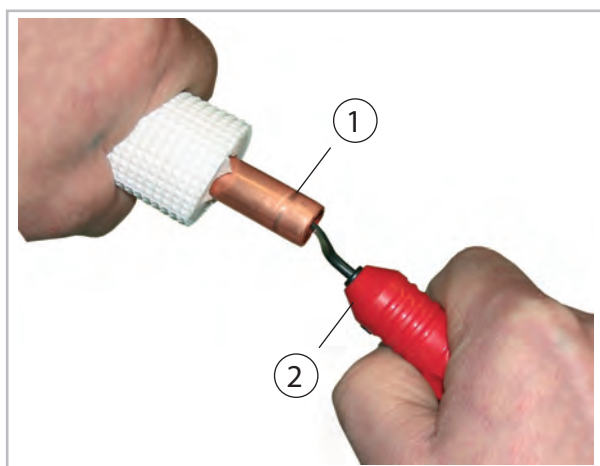


Fig. 28: Deburring the refrigerant piping

- 1: Refrigerant piping
- 2: Deburrer

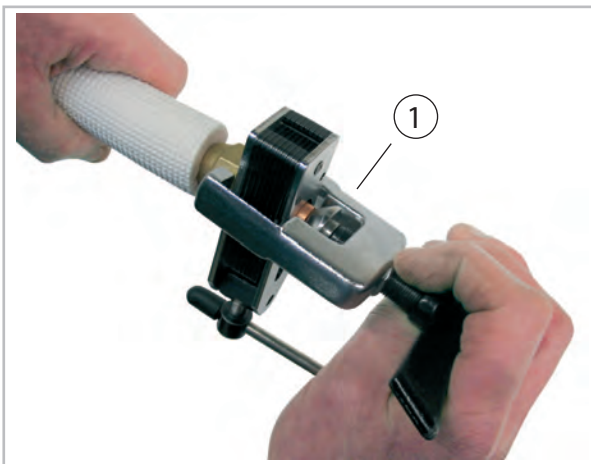


Fig. 29: Flanging the refrigerant piping

- 1: Flanging tool

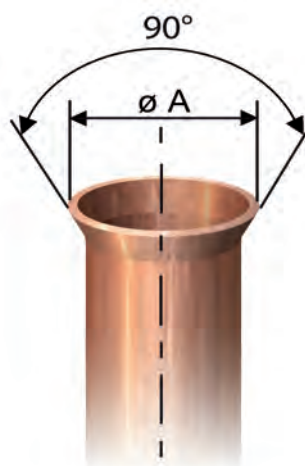


Fig. 30: Correct flange shape

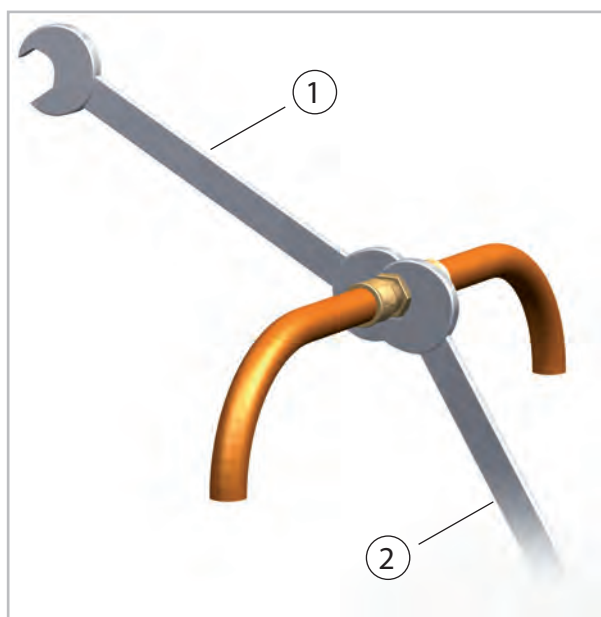


Fig. 31: Tightening the fitting

- 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 Additional notes on connecting the refrigerant piping

- When combining the outdoor unit with some indoor units, the procedure for connecting the refrigerant piping may differ. Install the provided reducer or expansion fittings to the indoor unit.
- If the basic length of the connecting line exceeds 5m, add refrigerant when commissioning the system for the first time (see chapter "Adding refrigerant").

6.4 Leak testing

Once all the connections have been made, the pressure gauge station is attached to the Schrader valve as follows (if fitted):

red = small valve = high pressure

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.

REMKO RVT series

6.5 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
RVT 265 DC	0 g/m	20 g/m
RVT 355 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

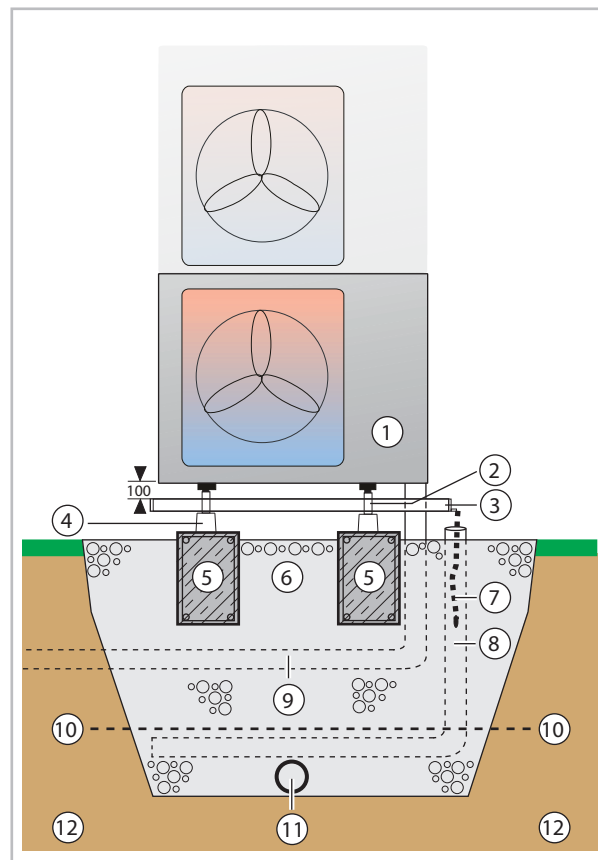


Fig. 32: Condensate drainage, seepage of condensate and strip foundation (cross-section)

- 1: Outdoor unit
- 2: Leg
- 3: Condensate collection tray
- 4: Floor bracket
- 5: Reinforced strip foundation
HxWxD = 300x200x800mm
- 6: Gravel layer for seepage
- 7: Condensate drainage heating
- 8: Drainage channel
- 9: Conduit for refrigerant piping and electrical
connecting line (temperature-resistant up to at
least 60°C)
- 10: Frost line
- 11: Drainage pipe
- 12: Soil

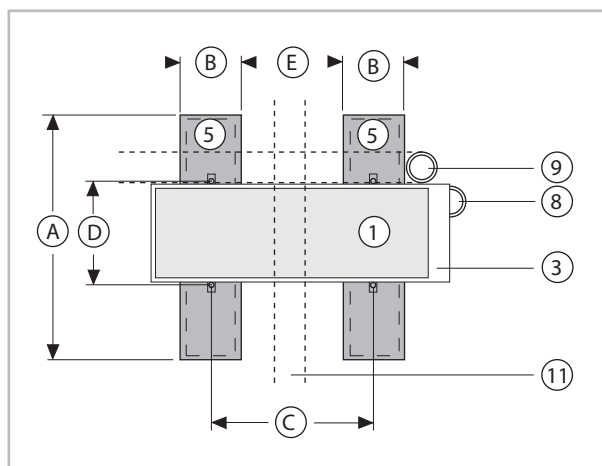


Fig. 33: Dimensions for the strip foundation (bird's eye view)

For the designations of 1,3,5,8,9 and 11, please refer to the legend for Fig. 32

dimensioning of the strip foundation (in mm)

Dimension	RVT 265-355 DC
A	800
B	200
C	514
D	298
E	287

Condensate drainage connection

If the temperature falls below the dew point, condensation will form on the finned condenser during **heating mode**.

A condensate tray should be installed on the underside of the unit to drain any condensate.

- 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.
- When operating the unit at outside temperatures below 4 °C, ensure the condensate drainage line is laid to protect it against frost. The lower part of the housing and condensate tray is also to be kept frost free in order to ensure permanent draining of the condensate. 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.

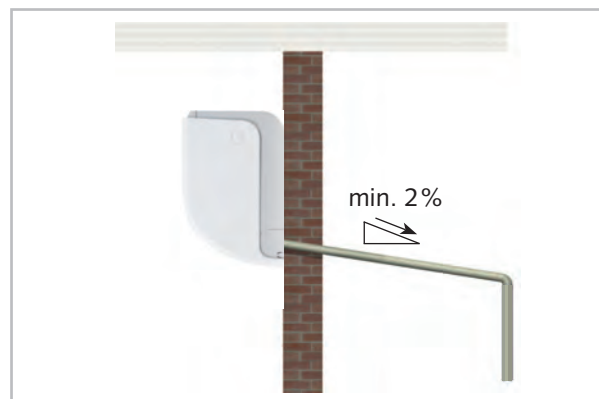


Fig. 34: Condensate drainage connection - Indoor unit

Safe drainage in the event of leakages

The REMKO oil separator OA 2.2 fulfils the following list of requirements from regional regulations and laws.

! NOTICE!

Local regulations or environmental laws, for example the German Water Resource Law (WHG), can require suitable precautions to protect against uncontrolled draining in case of leakage to provide for safe disposal of escaping refrigerator oil or hazardous media.

! NOTICE!

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

REMKO RVT series

8 Electrical wiring

8.1 General Information

A protected power supply cable is to be connected to the outdoor unit and a five-core control line to the indoor unit respectively.

DANGER!

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

WARNING!

All electric lines are in accordance VDE regulations to dimension and to lay.

NOTICE!

The electrical connection of the units must be carried out in accordance with VDE regulations. We recommend using an FI circuit breaker that is sensitive to all currents, as increased leakage currents can occur.



We recommend using shielded wires for the control lines.



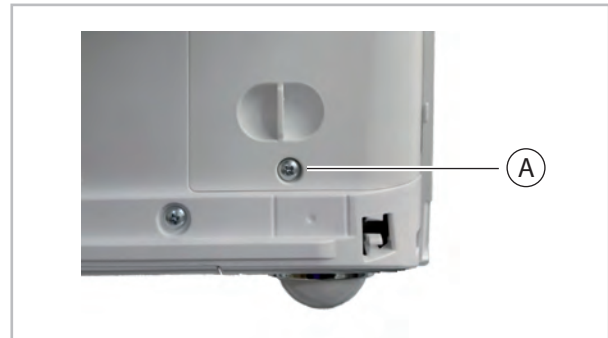
Check all plugged and clamped terminals to verify that they are seated correctly and make permanent contact. Tighten as required.

8.2 Connecting the indoor unit

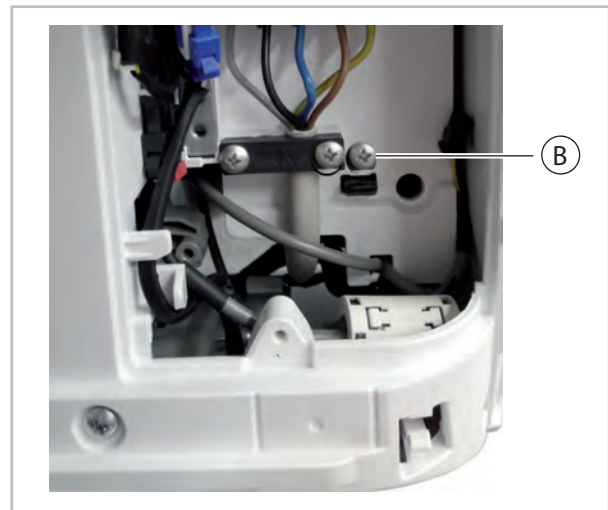
- We recommend that a mains/repair switch be installed near the outdoor unit.
- The terminal blocks for making the connections are located on the front of the unit. Two covers must be removed to make a connection.
- If an optional condensate pump is used as an accessory in conjunction with the unit, 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.

Make the connection as follows:

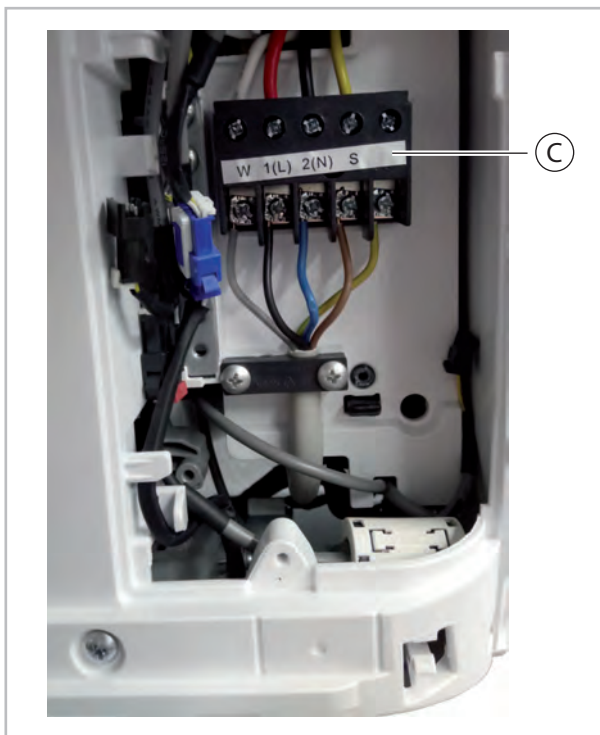
1. ➤ Swivel the panel of the unit upwards.
2. ➤ Remove the screw [A] and remove the cover.



3. ➤ Now remove the screw [B] and remove the cover from the terminal block.



4. ➤ Connect the customer-laid control line to the terminals [C].



5. → Screw the two covers in place and close the front flap.

8.3 Connecting the outdoor unit

Proceed as follows to connect the line:

1. → Remove the side-panel cover.
2. → Choose a cable-section according to the relevant specifications.
3. → Connect the lines as shown on the electrical connection diagram.
4. → Fix the line in the strain relief and re-assemble the unit.

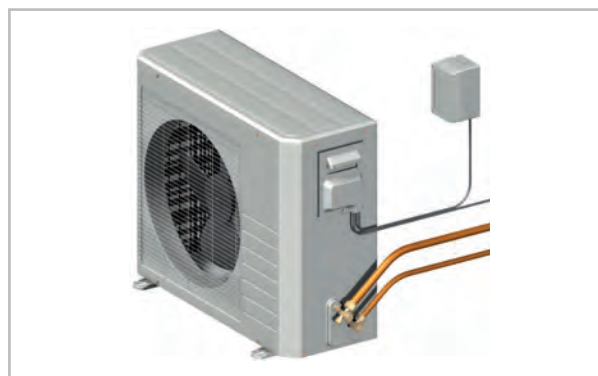


Fig. 35: Connecting the outdoor unit

8.4 Electrical wiring diagram

Connection RVT 265-355 DC

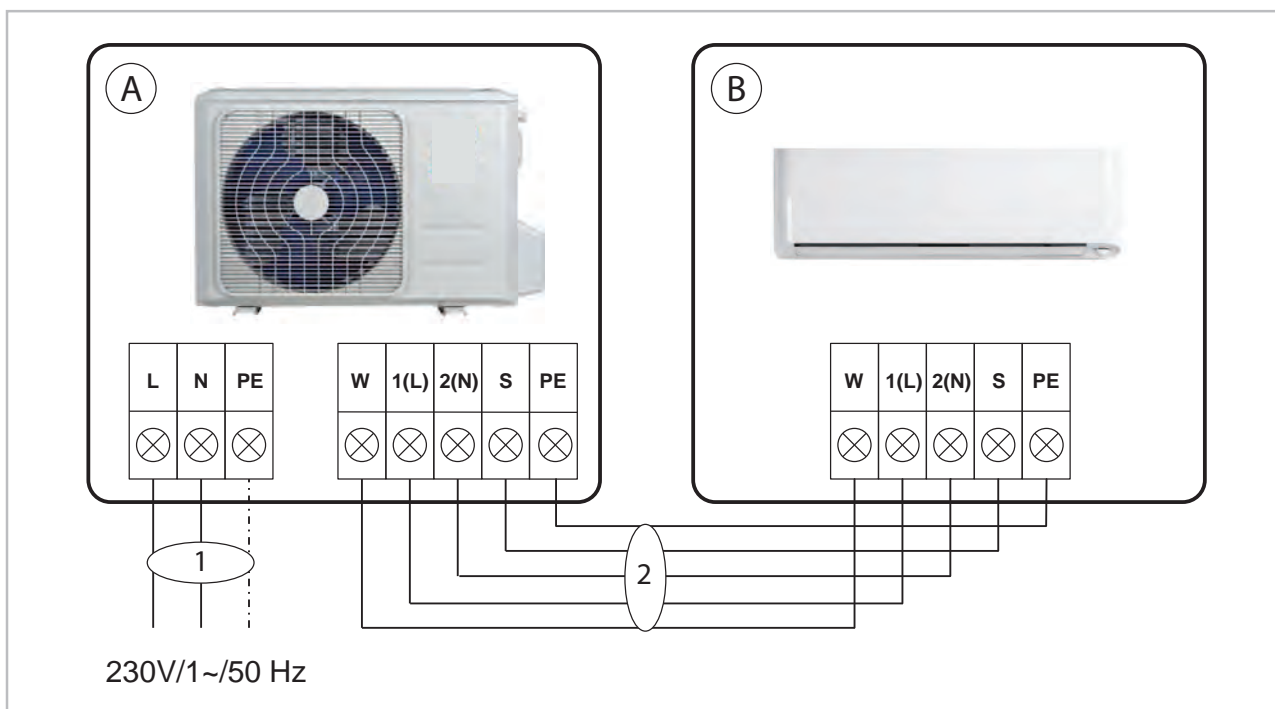


Fig. 36: Electrical wiring diagram

A: Outdoor unit RVT 265-355 DC AT
B: Indoor unit RVT 265-355 DC IT

1: Power supply cable

REMKO RVT series

2: Communication line

Connection of optional condensate pump KP 6/KP 8

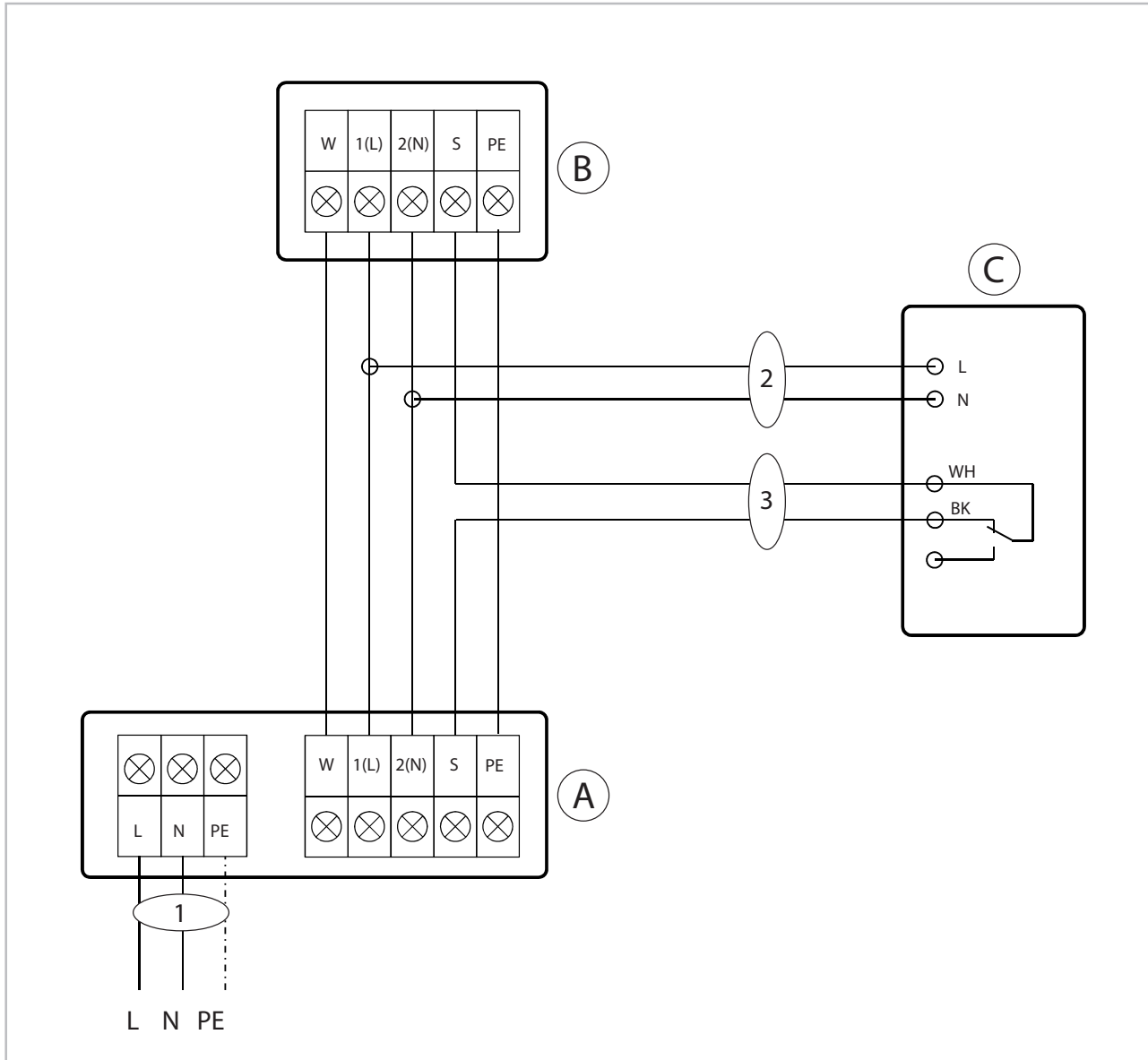


Fig. 37: Electrical wiring diagram

A: Outdoor unit
 B: Indoor unit
 C: KP6/KP8 condensate pump
 1: Power supply cable

2: Condensate pump supply
 3: Condensate pump fault contact
 BK: black
 WH: white

8.5 Electrical drawings

Indoor units RVT 265-355 DC IT

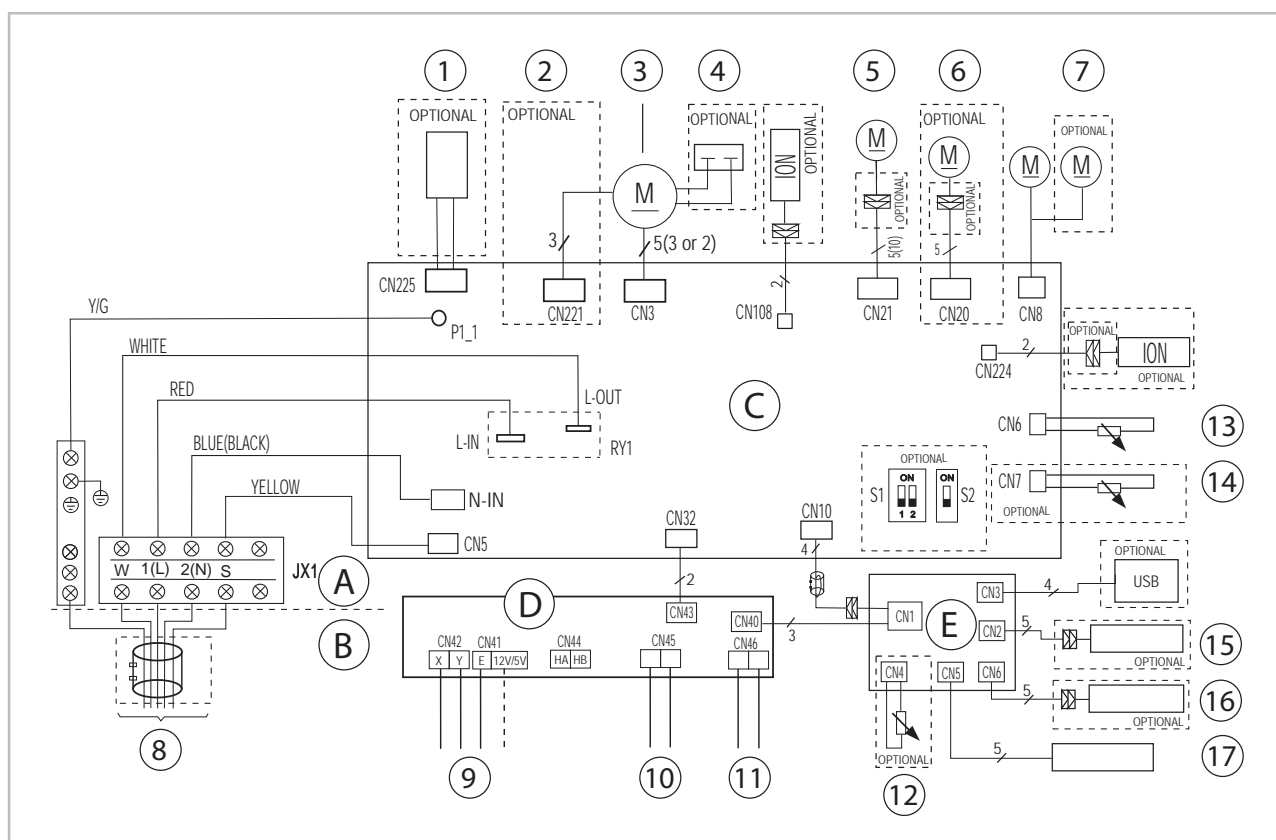


Fig. 38: Electrical drawings RVT 265-355 DC IT

- | | |
|-----------------------------|---|
| A: Indoor unit | 7: Swing motor 3 (optional) |
| B: Outdoor unit | 8: Connection to the outdoor unit |
| C: Control board | 9: Smart-Control Touch SC-1 connecting facility |
| D: Multifunction board | 10: Potential-free alarm contact |
| E: Display circuit board | 11: Potential-free "On/Off" contact |
| 1: Ion generator (optional) | 12: Room temperature probe |
| 2: AC fan motor connection | 13: Probe, evaporator |
| 3: Fan motor | 14: Room temperature probe |
| 4: Capacitor | 15: Cabled remote control |
| 5: Swing motor 1 | 16: Infrared probe |
| 6: Swing motor 2 (optional) | 17: Humidity probe |

REMKO RVT series

Outdoor units RVT 265-355 DC AT

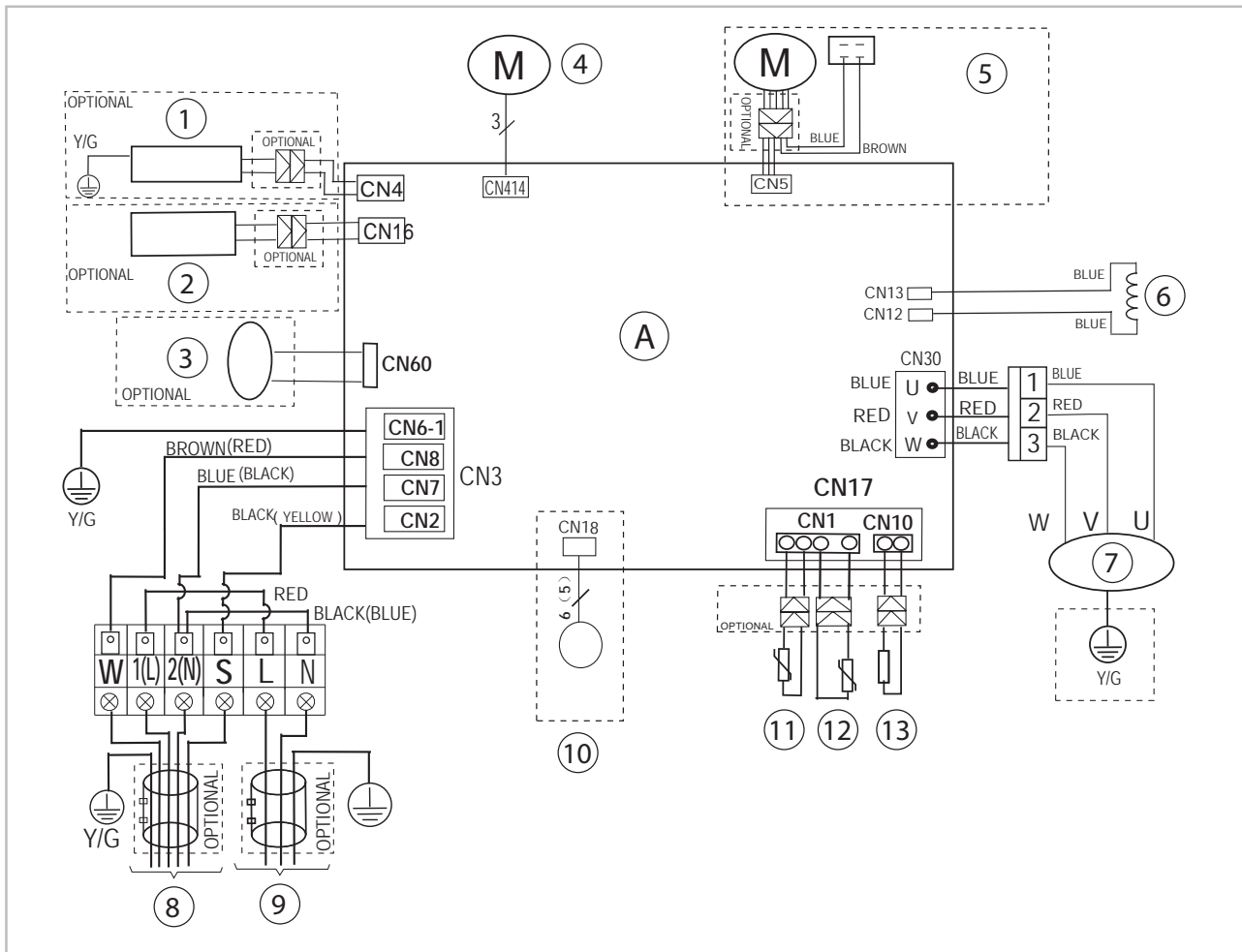


Fig. 39: Electrical drawings RVT 265-355 DC AT

- | | |
|-----------------------------------|------------------------------|
| A: Control board | 6: Capacitor |
| 1: Heater condensate tray | 7: Compressor |
| 2: Crankcase heating, compressor | 8: Connection to indoor unit |
| 1: Compressor | 9: Power supply cable |
| 2: Supply line to the indoor unit | 10: Electric expansion valve |
| 3: 4-way valve | 11: Outside air probe |
| 4: DC fan motor (not available) | 12: Condenser probe |
| 5: AC fan motor | 13: Heat gas probe |

8.6 Connection of a superordinate controller

Units of type RVT have a multifunction PCB installed in the panel of the unit which has various connecting facilities for superordinate controllers.

Connecting facilities of the multifunction PCB

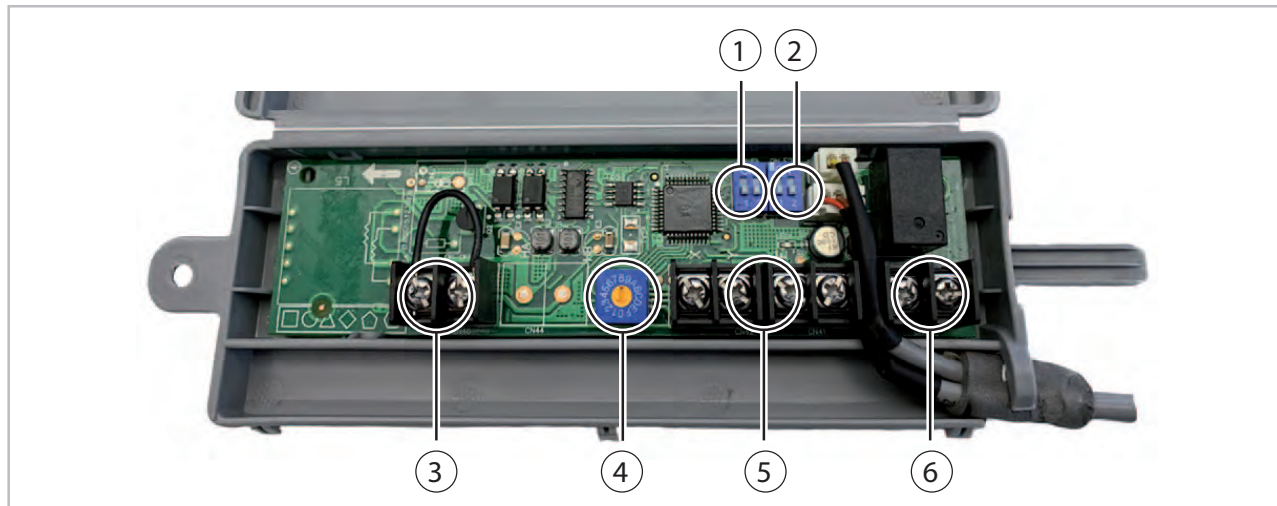


Fig. 40: Connection terminals

① F1: Extended address allocation

Addresses 00-15 can be allocated using rotary switch ENC1 if both F1 DIP switches are set to "OFF". Move DIP switches 1 and 2 to different positions to allocate up to 64 addresses.

② F2: Function logic of the On/Off contact

If both F2 DIP switches are set to "OFF", the system starts up when the CN46 contact is closed. If the CN46 contact is opened the system switches to standby. If the CN46 contact is closed again, the system operates in the most recently used operating mode.

③ CN46: Potential-free contact for external on/off switching

Bridged in the factory. If the contact is closed, the system is in normal operation. If the contact is opened the system switches to standby mode. Closing the contact again switches the system to the most recently used operating mode.

④ ENC3: Addressing of the indoor unit

An address can be assigned to the indoor unit using the rotary switch. The address is set to "00" in the factory. If you use several units with a Smart Control Touch Controller, they must be set to different addresses. The letters A-F stand for addresses 10-16.

⑤ CN41/CN42: X, Y, E interface for superordinate controller

A superordinate controller (such as a Smart-Control Touch SC-1) can be connected using the X, Y and E interface. Observe the installation and operating instructions of the respective accessory part when doing this.

⑥ CN45: Potential-free alarm contact

In the event of a system malfunction, this contact is closed. Customer-provided unit control technology (GLT) can be connected here to provide fault notification.

REMKO RVT series

Electrical wiring for optional KFB-R redundancy controller

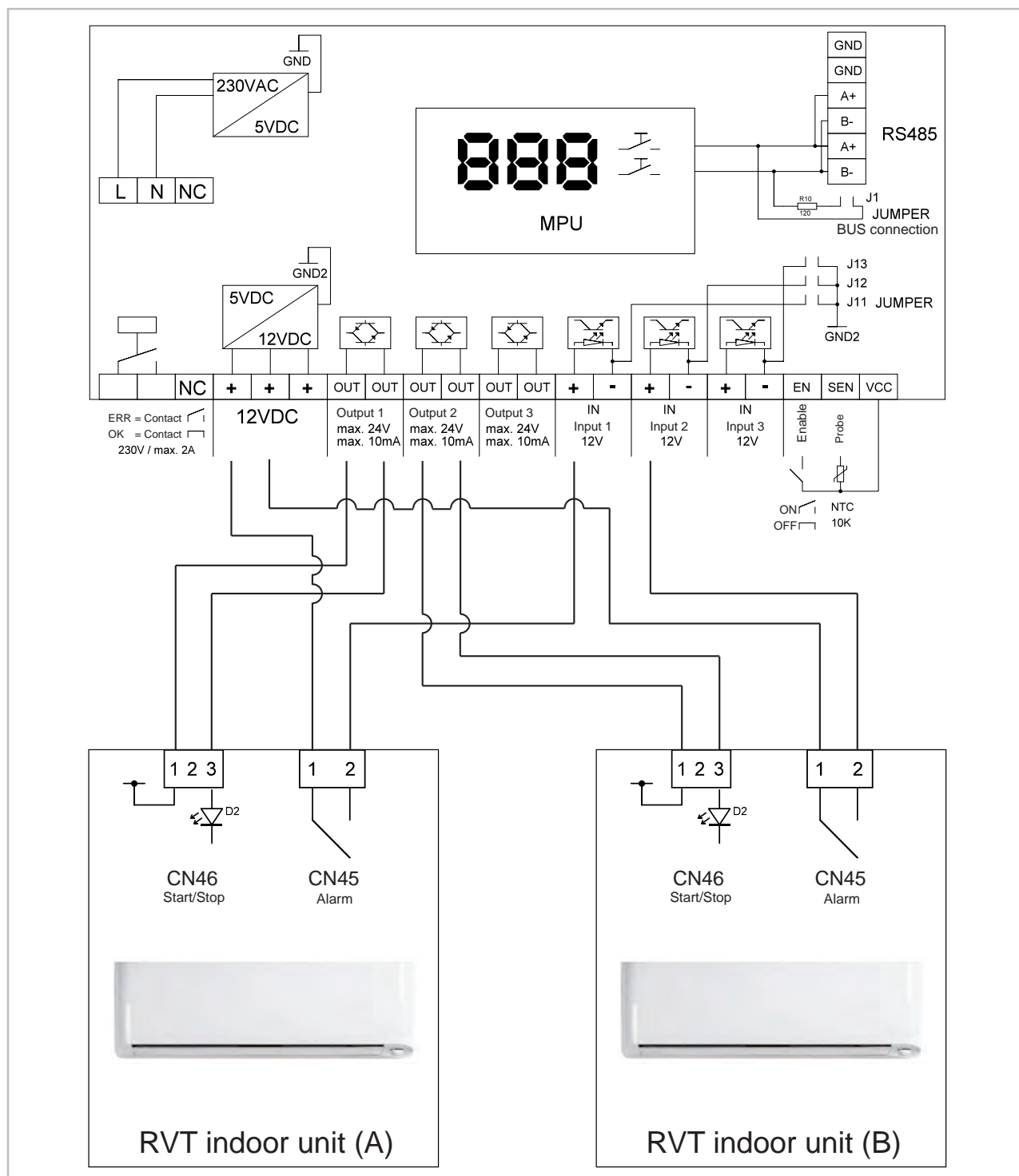


Fig. 41: Elektrisches Anschlussschema KFB-R



When establishing the connection between the unit series RVT 265-355 DC and the redundancy control KFB-R, the "InF" parameter of the redundancy control must be set to 1.

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.

REMKO RVT series

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 (to be provided by the customer).
6. ➤ Press the test knob on the outdoor unit and wait until a frequency of min. 50 Hz is established.
7. ➤ Use the remote control to switch on the unit and select the cooling mode, maximum fan speed and lowest target temperature.
8. ➤ 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.
9. ➤ 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.
10. ➤ Check the correct function of the condensate drainage by pouring distilled water into the condensate tray. A bottle with a spout is recommended for pouring the water into the condensation tray.
11. ➤ Switch the indoor unit to heating mode.
12. ➤ During the test run, check the functionality of all of the previously described safety devices.
13. ➤ Record the measured values into the commissioning report and familiarise the operator with the system.
14. ➤ Remove the pressure gauge. Check that seals have been fitted in the sealing caps.
15. ➤ Re-install all disassembled parts.

11 Troubleshooting, fault analysis and customer service

11.1 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 alarms 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
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
The unit works at reduced or no cooling capacity	Filter is dirty / air inlet / outlet opening is blocked by debris	Have the filters been cleaned?	Clean the filters

REMKO RVT series

Malfunction	Possible causes	Checks	Remedial measures
	Windows and doors open. Heating / cooling load has increased	Have structural / usage modifications been made?	Close windows and doors / install additional units
	Cooling mode is not set	Does the cooling symbol appear on the display?	Correct the settings for the unit
	Fins on outdoor unit blocked by foreign objects	Does the fan of the outdoor unit work? Are the exchanger 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
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.
	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

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!

Fault display on the indoor unit

Display	Error description
E0	EEPROM error, indoor unit
E1	Communication error between indoor unit and outdoor unit
E3	Fan speed control indoor unit disabled
E4	Room temperature probe T1 defective
E5	Temperature probe, evaporator T2 defective
F0	Overflow protection
F1	Temperature probe air inlet outdoor unit T4 defective
F2	Temperature probe, evaporator outlet T3 defective
F3	Temperature probe, heat gas line T5 defective
F4	EEPROM error, outdoor unit
F5	Condenser fan speed control probe not working
P0	Compressor actuation error
P1	Over-voltage or under-voltage error
P2	Compressor overheating protection (heat gas temperature too high)
P4	Inverter control disabled
EC	No cooling capacity after 30 minutes
dF	Defrosting
CP	No external release
CL	Self-cleaning function active

For fault elimination refer to troubleshooting on the following pages.

11.2 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	

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Error code:	E1
Reason:	The indoor unit does not receive a signal from the outdoor unit within 110 seconds. The check is performed 4 times in a row, then error E1 is displayed.
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. Does the valve fluctuate between -25 V and 25 V?	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 error rectified?
↓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 error rectified?		
↓NO		
Replace the control boards of the indoor unit		



Fig. 42: Transformer measurement

Check the transformer (must not be connected to a condenser) with a multimeter. The normal value is approx. 0 Ohm. If the value deviates, replace the transformer.

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 F5
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 ↗ 'Procedure' on page 54). Does the measured voltage lie within the tolerance range?	NO →	Replace the control board.
↓YES		
Replace the fan motor. Is the error rectified?	NO →	

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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.

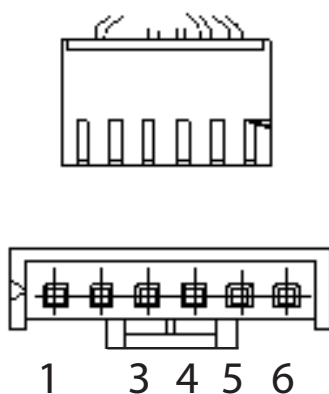


Fig. 43: Motor measurements

Terminal	Colour	Voltage
1	Red	280V~380V
2	---	---
3	Black	0 V
4	White	14-17.5V
5	Yellow	0~5.6V
6	Blue	14-17.5V

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.

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, 8 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.	JOO →	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. Did you find a leak?		Exchange the control boards of the indoor unit.
	JOO →	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?		

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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. 44: Check the probes

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? (See ⚡ on page 52)	NO →	Replace the transformer or control boards of the outdoor unit.
↓YES		
Replace the outdoor unit.		

REMKO RVT series

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"> ■ Electrical connection faulty ■ Faulty control board ■ Condenser fan motor defective or blocked ■ Compressor defective

Check the connecting cables between the control board and compressor? Are they faulty?	JO →	Establish a correct connection between the control board and compressor.
↓NO		
Check the inverter controller (see section <i>↗ 'Check the inverter controller' on page 58</i>). Error rectified?	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.		

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	RVT 265 DC	RVT 355 DC
U	N	2.35 Ω (20°C/68°F)	1.57 Ω (20°C/68°F)
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. 310V, 340V or 380V 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.		

REMKO RVT series

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

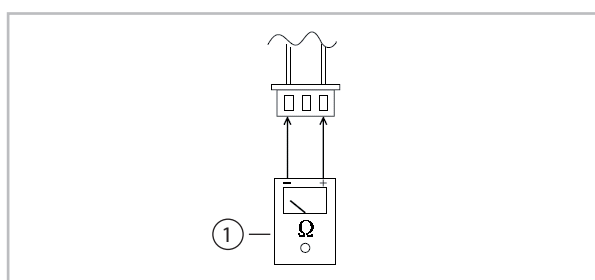
Check the air flow volumes of the indoor unit and outdoor unit. Are they blocked or dirty?	JOO →	Clean the filter or heat exchanger and ensure a sufficient air flow volume.		
↓NO				
Switch off the power supply to the unit and switch it on again after 10 mins. Does the unit start up?				
↓YES				
Check 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 this OK?	JOO →	Replace the control board of the outdoor unit.		

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?	JOO →	Establish a proper connection.
↓NO		
Check the inverter controller. Is this functional?	NO →	Replace the control board.
↓YES		
Check the condenser fan motor. Is this 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 the 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.

REMKO RVT series

11.3 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

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

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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		

12 Care and maintenance

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



DANGER!

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

Care

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

Maintenance

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



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



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.

Type of task Checks/maintenance/inspection	Commis- sioning	Monthly	Half- yearly	Yearly
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

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Cleaning the housing

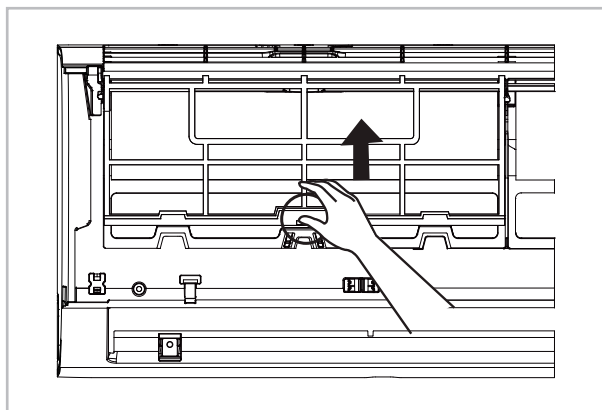
1. ➤ Disconnect the power supply to the unit.
2. ➤ Open and fold the air inlet grill on the front side upwards.
3. ➤ Clean the grill and cover with a soft, damp cloth.
4. ➤ Switch the power supply back on.

Cleaning the air filter

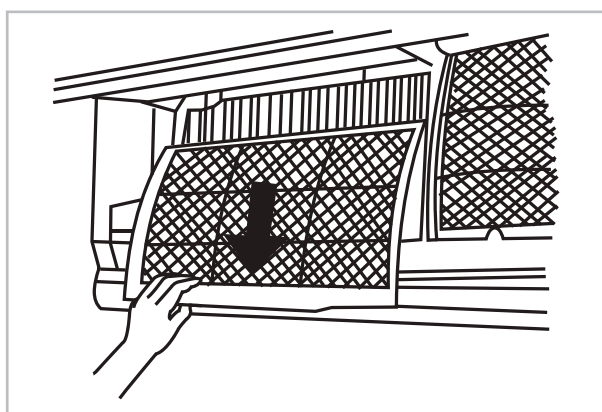
Clean the air filter at intervals of no more than 2 weeks. Reduce this interval if the air is especially dirty.

Please proceed as follows to clean the filters:

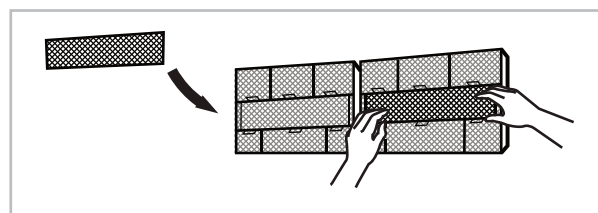
1. ➤ Lift the front panel of the indoor unit.
2. ➤ First press the clip of the filter up and release the clasp, lift it and pull it out from the front.



3. ➤ Pull out the filter.



4. ➤ If your filter has a small air freshening filter, detach it from the bigger filter.



5. ➤ Clean this filter using a normal vacuum cleaner. To do so, turn the dirty side so it is facing upwards.



6. ➤ Then clean the large air filter with lukewarm water and a mild detergent. The dirty side should be face down.



7. ➤ Rinse the filter with fresh water and shake off any excess water.

If water is used, let the filter dry out properly in the air before fitting it back into the unit.

8. ➤ Carefully insert the filter. Ensure that it locates correctly.
9. ➤ Close the front panel of the indoor unit again.

Cleaning the condensate pump (accessories)

The indoor unit may contain an optional integrated or separate condensate pump, which pumps out any accumulated condensate into higher positioned drains.

Observe the care and maintenance instructions in the separate operating manual.

13 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 RVT series

14 Exploded view and spare parts lists

14.1 Exploded view of indoor unit RVT 265-355 DC IT

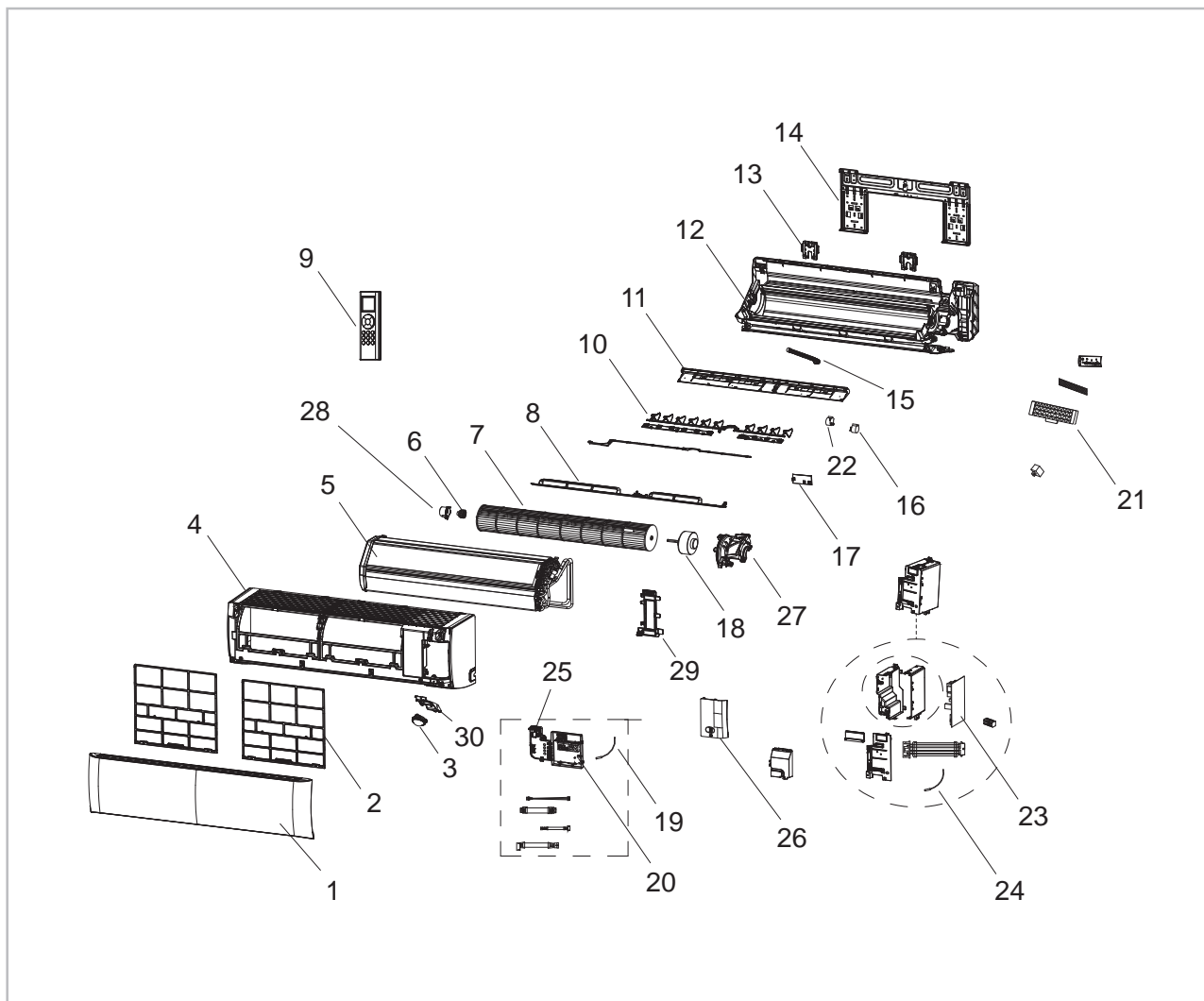


Fig. 45: Exploded view of the unit RVT 265-355 DC IT

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

14.2 Spare parts list for the indoor unit RVT 265-355 DC IT



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	Unit trim
2	Air filters, set
3	Intelligent eye
4	Housing front
5	Evaporator
6	Fan bearing
7	Aerator roller
8	Air deflection blade, horizontal
9	Infrared remote control
10	Air deflection blade, vertical, individual
11	Fastening rail
12	Housing back
13	Probe, evaporator
14	Wall bracket spacer
15	Condensate hose
16	Fin motor, vertical
17	Cover
18	Fan motor
19	Temperature probe, indoor air
20	Display box, cpl.
21	Fine dust filter
22	Fin motor, horizontal
23	Control board
24	Temperature probe, evaporator
25	Humidity probe
26	Electrical connections cover
27	27 fan motor cover
28	Fan bearing bracket
29	Refrigerant piping securing bracket
30	Intelligent eye bracket

REMKO RVT series

14.3 Exploded view of the outdoor units RVT 265-355 DC AT

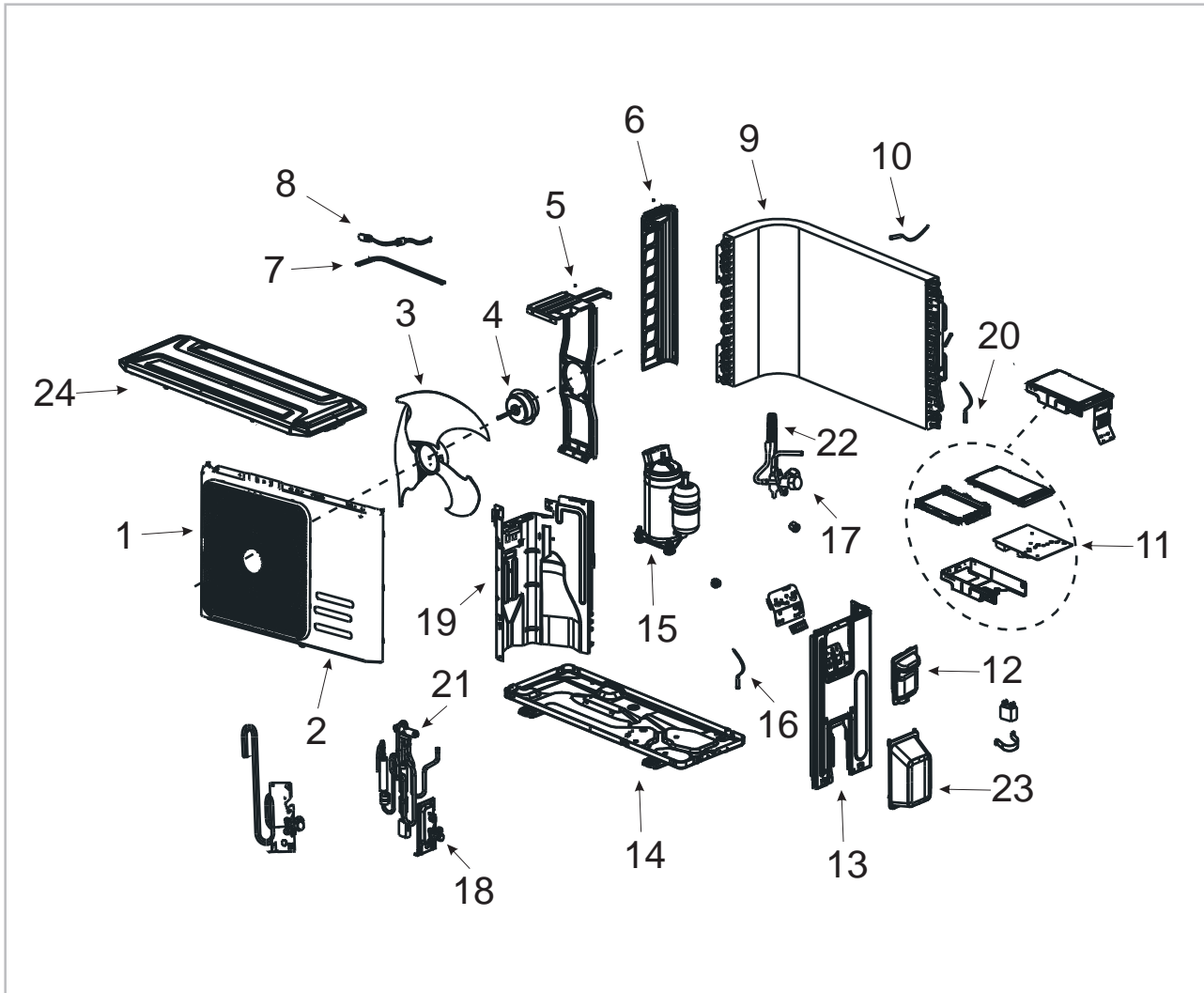


Fig. 46: Exploded view of the unit RVT 265-355 DC AT

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

14.4 Spare parts list for outdoor units RVT 265-355 DC AT



IMPORTANT!

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

No.	Designation
1	Air outlet grid
2	Front wall
3	Fan blade
4	Fan motor
5	Fan motor mounting plate
6	Corner panel, left
7	Condensate tray heating
8	Crankcase heating
9	Condenser
10	Air inlet temperature probe
11	Control board
12	Recessed grip
13	Side section, right
14	Floor panel
15	Compressor
16	Heat gas temperature probe
17	Shut-off valve, suction pipe
18	Shut-off valve, injection pipe
19	Partitioning panel
20	Condenser temperature probe
21	4-way valve
22	Electronic injection valve
23	Refrigerant connections cover
24	Cover panel

REMKO RVT series

15 Index

A		
Alarms		
Checks	49	
Possible causes	49	
Remedial measures	49	
Assembly		
Strip foundation	38	
C		
Care and maintenance	65	
Cleaning		
Air filter for indoor unit	66	
Condensate pump	66	
Housing	66	
Condensate drainage connection and safe drainage	38	
Condensate pump, electrical wiring diagram	42	
Cooling mode	17	
Customer service	49	
D		
Disposal of equipment	8	
E		
Electrical drawings	43, 44	
Electrical wiring	40	
Electrical wiring diagram	41	
Electrical wiring diagram, condensate pump	42	
Environmental protection	8	
Exploded view of the unit	68, 70	
F		
Fault display on the indoor unit	51	
Function test of the cooling and heating modes	48	
Functional checks	47	
I		
Infrared remote control	19	
Installation		
Outdoor unit	29	
Installation materials	28	
Intended use	7	
K		
Keys on the remote control	20	
M		
Maintenance	65	
Manual mode	19	
Minimum clearances	31	
Multifunction board, connection	45	
O		
Oil return measures	32	
Ordering spare parts	69, 71	
P		
Propellant in accordance with Kyoto Protocol	10	
R		
Remote control		
Keys	20	
Resistances		
Temperature probes	62	
S		
Safe drainage in the event of leakages	39	
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	
Shutdown		
Permanent	67	
Temporary	67	
Spare parts list	69, 71	
T		
Temperature probes		
Resistances	62	
Test run	47	
Troubleshooting and customer service	49	
U		
Unit installation	34	
W		
Wall opening	28	
Warranty	7	

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