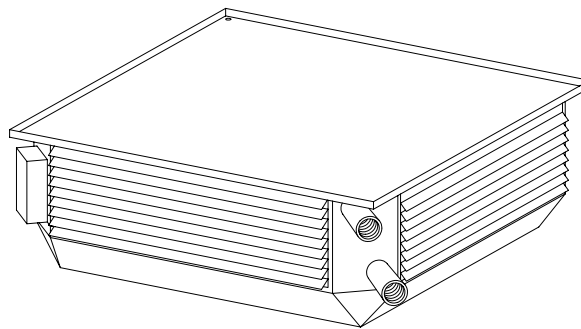




REMKO PWW 5000

Warm Water Ceiling-Mounted Heating Units



Operation
Technology
Spare Parts

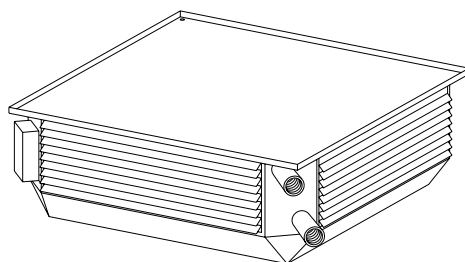
Operating Instructions

Read these instructions carefully before setting up/operating the unit!

Our guarantee becomes null and void if the unit is used, set up or maintained improperly,
or if modifications are made to the supplied unit without our prior consent.

Subject to alterations!

Warm Water Ceiling-Mounted Heating Units REMKO PWW 5000



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Always keep these operating instructions near or on the unit!




Safety Instructions

Extensive tests have been conducted on the material, functionality and quality of the units.

Hazards may nevertheless arise if the unit is used by persons not familiar with its operation or if the unit is not used for its intended purpose.

Please make sure to always comply with these safety instructions:

- ◇ The relevant local building codes must always be observed!
- ◇ The operator is responsible for proper unit assembly, correct electrical installation and safe operation of the units.
- ◇ The units must be set up, mounted and operated in such a way that employees are not bothered by or put at risk of radiant heat.
- ◇ The units may only be attached to sturdy constructions or ceilings made of materials with adequate bearing capacity.
- ◇ The units must be attached with sturdy wall mounts that are fastened to the unit.
- ◇ Assembly, connection of the heating medium, connection of the electrical system and maintenance may only be performed by trained and authorised personnel.
- ◇ The units may not be set up, assembled or operated in surroundings susceptible to fire or explosions.
- ◇ The units must be set up outside of high-traffic zones, e.g. also cranes.
A safety zone of 1 m must be maintained.
- ◇ The units may only be operated when mounted.
- ◇ Safety components such as, for example, protective grilles, may not be disassembled or taken out of operation.
- ◇ The units may only be used for their intended purpose within the specified operating ranges and with approved transport media.
See type plate.
- ◇ The air intake grille must always be kept free of dirt and loose objects; the unit outlets may not be blocked.
- ◇ Never insert foreign objects into the unit.
- ◇ The units may not be exposed to a direct stream of water.
- ◇ Never let water get inside the units.
- ◇ All of the unit's electrical lines must be protected from damage, e.g. by animals.

 **The units are only ensured to function properly if the initial temperature in the unit supply lines and the pump capacity are adequate for the selected class of unit.**

Assembly Instructions

Follow these instructions to ensure that the units are assembled safely and effectively:

- ◇ The heat-exchanger must be connected in such a way that vibrations from the unit may not be transferred to the piping systems or vice-versa.
- ◇ Before connecting the unit to an existing warm water heating system, the boiler and pump must be checked for adequate capacity.
- ◇ For maintenance and repairs, we recommend attaching a repair switch close to the unit.
- ◇ After all attachment screws have been tightened evenly, the fan is to be checked to ensure that it is running smoothly.
- ◇ The permissible assembly heights must be observed.

The minimum permissible distances from the floor to the lower edge of the unit can be found in the table in the section on unit assembly.

Unit Assembly

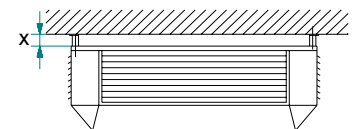
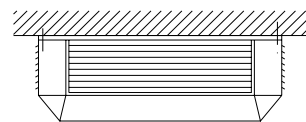
The units are intended for assembly under the ceiling. Adjustable assembly profiles make it possible to adjust the units easily to suspended ceilings as well.

The units are attached directly under the ceiling or with assembly profiles that can be purchased as accessories.

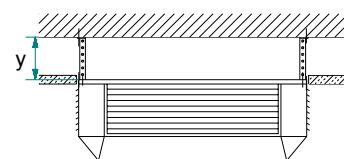
Assembly options:

A: Aligned under the ceiling

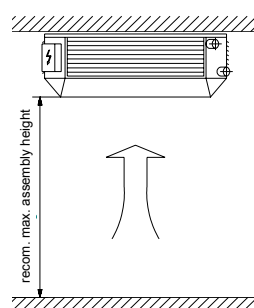
B: With a fixed assembly profile
(Dimension x = 40 mm)



C: With adjustable assembly profile
(Dimension y = 150 - 250 mm)



The permissible assembly heights must be observed.



Recommended max. assembly height:	
	Distance from floor to lower edge of unit
PWW 5102	2,3 m
PWW 5202	2,4 m
PWW 5402	2,6 m
PWW 5602	3,3 m

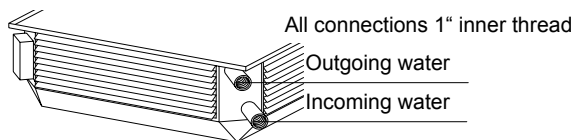
Connection to the heating system

Before connecting to the customer heating system, the heating and pump capacity must be checked to ensure that they meet the technical requirements of the respective unit.

The REMKO PWW unit should be connected via shut-off valve, automatic dehumidifier and screw attachments in the supply and return lines.

When connecting the screw attachments of the heating medium connection, a suitable tool should be used to apply counter-pressure to prevent damage caused by turning the connection lines.

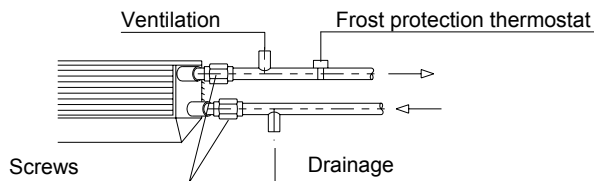
- ◇ The units operate on the principle of counter-current: *The water (supply line) usually comes in at the bottom, the water (return line) usually goes out at the top*
- ◇ Once assembled, the heat-exchanger must be carefully ventilated because air pockets in the register can reduce unit performance.



When the fan is idle, the heating medium supply must be interrupted.

Draining in case of frost

It is not possible to statically drain the heat-exchanger completely. The heat-exchanger can only be completely drained when compressed air is used.



Important information about frost protection!

To prevent frost damage, a frost protection mechanism must be attached for temperatures below 0 °C.

There may not be any water in the heat-exchanger for systems taken out of operation in rooms susceptible to frost. The remaining water must be blown out with compressed air.

If this is not possible, the heating medium (water) must be mixed with a suitable anti-freeze.

No guarantee claims can be made for frost damage on the heat-exchanger!

Electrical Connection

The requirements of the local energy supply company as well as installation requirements specific for each unit must be observed.

The electrical connection may only be made by trained and authorised personnel.

Restriction of guarantee!

Non-compliance with the relative legal requirements, operating instructions and unit-specific wiring diagrams can lead to malfunctions that cause damage. *In cases of non-compliance, the guarantee becomes null and void!*

Connecting the units

REMKO PWW 5000 models are equipped with axial fans that have external rotary current motors for a voltage of 400 V / 3~ / 50 Hz. Switching the two speeds of the rotary current motor is done with a Y / Δ switch.

Integrated thermal contacts protect the motor. They switch off the fan motor at a winding temperature of 130 °C in connection with a suitable switching device (accessory).

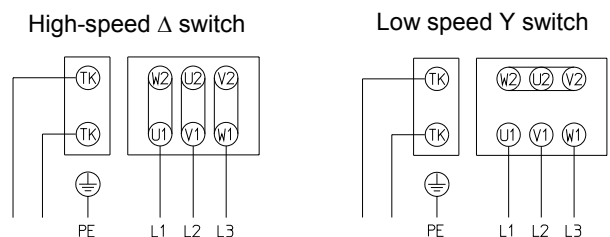
The rotary current motors are connected to the corresponding switching units in accordance with the respective electrical wiring diagrams.

The corresponding power fuse in the line to the switching unit must be installed by the customer in line with the relevant regulations.

The connections in the terminal box of the unit must be connected to the corresponding switching unit (accessory).

Connecting the fan motor

Motor with 2 speeds, Y/Δ switch and thermal contacts.



Connecting several units

If necessary, several units (even of different sizes) can be operated at the same time via a switching unit (accessory).

The overall capacity of the connected units may not, however, exceed the maximum electrical capacity of the corresponding switching unit.

For thermal motor protection, the thermal contacts of all motors are to be connected in a row. Follow the separate wiring diagrams.

There can never be more than one external regulating mechanism per switching unit connected at a single time!

Initial Operation

Prior to initial operation

Prior to initial operation, the following must be completed:

1. Check that assembly is mechanically sound.
2. Check that the connection to the customer-installed heating system is correct.
3. Make sure that hot surfaces, e.g. the supply lines, are protected against unintentional contact.
4. Make sure that all air outlet openings are opened.
5. Activate the power supply to the switching unit and switch the unit on via the control switch.
6. Initial operation is prohibited until it is ensured that the proper assembly and electrical installation corresponds to the provisions of the EU guidelines 89/392/EWG and 73/23/EWG.

During initial operation

1. Measure the power consumption of the fan.
The rated current may not exceed the value specified on the type plate in each switch phase.
2. Check the control/regulating function of the fan.
3. Check the function of the room thermostat.
If mounted.
4. Check that the fan is running quietly.
5. Check the entire system for any vibrations.
6. Check that the heating medium supply lines have been properly connected and are impermeable.

Shutting Down the Unit

Prior to longer periods of non-operation

- ◇ Switch all poles of the electrical connections off.
- ◇ If there is a danger of frost, drain the system if the heating medium (water) has not been mixed with a suitable anti-freeze.


 **It is only possible to completely drain the heat-exchanger with compressed air.**

Service and Care

REMKO PWW units require virtually no maintenance when operated normally. They should, however, be checked regularly and, if necessary, cleaned, to ensure proper operation.

1. Separate all poles of the unit from the power supply and secure it from being switched on by unauthorised persons.
It is not adequate to switch the unit off via the control switch on the switching unit!

2. Wait until the fan stops.
3. Turn off the flow of water and secure it from being opened on by unauthorised persons.
4. Wait until the heat-exchanger has cooled down.

 **Do not flood the motor and the housing. Do not damage or bend the fan blades or plate fins.**

Cleaning materials

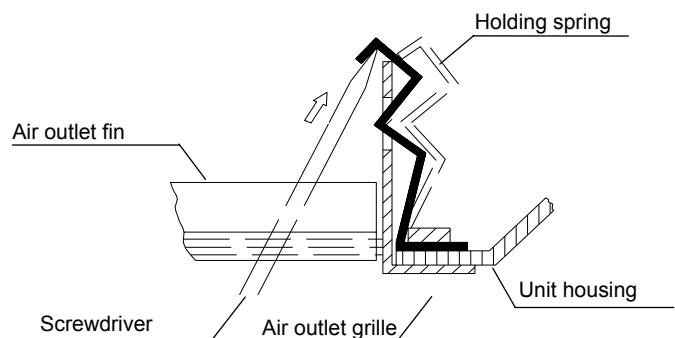
- ◇ Only clean the unit when dry or with a slightly moist towel and a soap solution.
- ◇ Never use high-pressure or steam cleaners.
- ◇ Do not use abrasive cleaners or cleaners that contain solvent.
- ◇ Even when the unit is extremely dirty, only use suitable cleaning materials.

General care

- ◇ Keep the inside and outside of the unit free of dust and other deposits.
- ◇ Keep the air intake and outlet openings from being blocked.
The 4 air outlet grilles can be easily removed from the front using a screwdriver.
- ◇ Check the protection grilles, the fan wings and the heat-exchanger at regular intervals for dirt.
- ◇ Clean the plate fins of the heat-exchanger by blowing air out or in or with a soft brush.
- ◇ Remove extreme dirt on the fan and plate fins with a soap solution.

Information on dismantling the air outlet grille

1. Press the black holding spring to the inside.
Using a screwdriver, etc.
2. Remove the air outlet grille to the front.



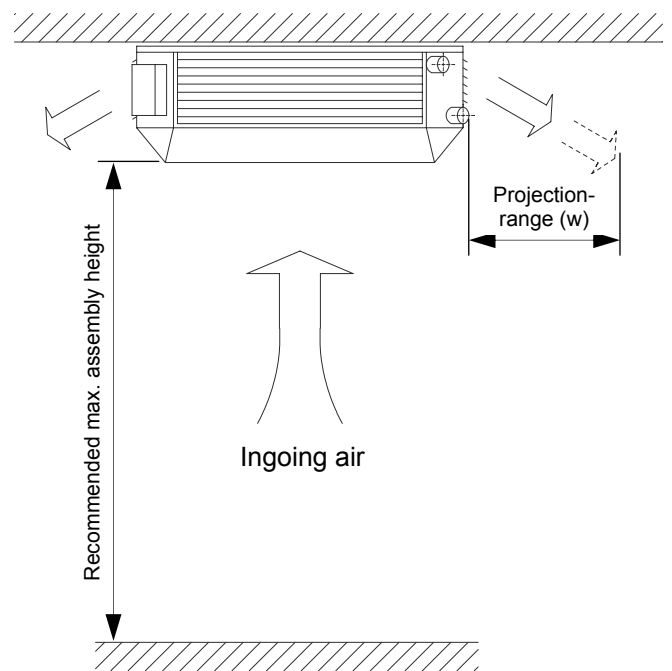
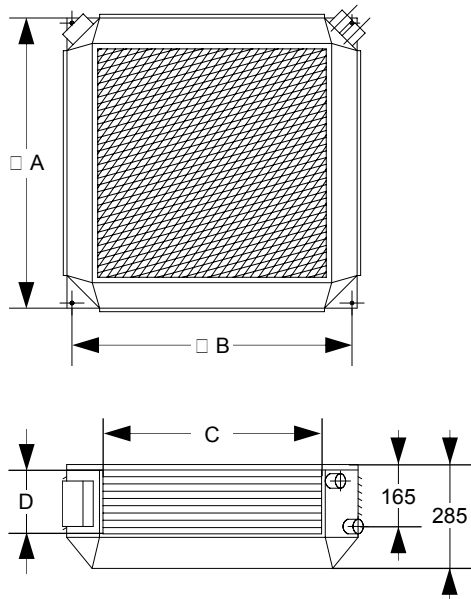
3. When inserting the grilles, push lightly on them until they click into their original position.

Technical Data

PWW 5000 series	Type	5102	5202	5402	5602
Electrical connection	V	400 / 3~, N, PE	400 / 3~, N, PE	400 / 3~, N, PE	400 / 3~, N, PE
Frequency	Hz	50	50	50	50
Power consumption	kW	0,05 / 0,033	0,11 / 0,07	0,16 / 0,095	0,35 / 0,21
Rated current	A	0,13 / 0,07	0,28 / 0,15	0,38 / 0,19	0,78 / 0,39
Speed	U/min	910 / 720	890 / 710	670 / 500	660 / 500
Air capacity	m³/h	1550 / 1200	2470 / 1900	3470 / 2500	5500 / 4200
Sound pressure level ¹⁾	dB (A)	51 / 45	54 / 47	57 / 50	60 / 53
Heating medium connection	Inch	R 1"	R 1"	R 1"	R 1"
Heating medium		Pump warm water or pump hot water up to max. 95 °C			
Max. assembly height	m	2,4	2,5	2,7	3,4
Heat projection range	m	3,5 / 2,6	3,6 / 2,7	4,0 / 2,9	4,6 / 3,4

1) Measurement at intervals of 5 m, measuring room volume 800 m³, average reverberation time 1.4 s

Dimensions



Type		5102	5202	5402	5602
A	mm	600	700	800	900
B	mm	572	672	772	872
C (grille)	mm	420	520	620	720
D (grille)	mm	170	170	170	170
weight	kg	25	32	39	46

Recommended max. assembly height:	
PWW 5102	2,3 m
PWW 5202	2,4 m
PWW 5402	2,6 m
PWW 5602	3,3 m

Technical Data PWW 5102 / 5202

Type		2 steps				2 steps			
		5102				5202			
Speed	U/min.	910		720		890		710	
Electrical connection	Volt	3 x 400		3 x 400		3 x 400		3 x 400	
Frequency	Hz	50		50		50		50	
Power consumption	kW	0,05		0,033		0,11		0,07	
Rated current	A	0,13		0,07		0,28		0,15	
Air capacity	m ³ /h	1550		1200		2470		1900	
Sound pressure level L _{pA} 1m ¹⁾	dB(A)	51		45		54		47	
Max. heat projection range	m	3,5		2,6		3,6		2,7	
Heating medium connection	inch	R 1"		R 1"		R 1"		R 1"	
Weight	kg	25		25		32		32	
Heating medium ²⁾	t _{L1} °C	kW	t _{L2} °C	kW	t _{L2} °C	kW	t _{L2} °C	kW	t _{L2} °C
50/40 °C	0	11,5	23	9,9	25	16,4	21	14,5	23
	5	10,2	26	8,8	28	14,6	24	12,8	26
	10	8,7	28	7,6	30	12,6	26	10,9	28
	15	7,3	31	6,3	32	10,5	29	9,2	30
	20	5,9	33	5,2	34	8,5	31	7,4	33
60/50 °C	0	14,6	29	12,7	32	21,0	26	18,3	29
	5	13,3	32	11,5	34	19,1	29	16,7	32
	10	11,8	35	10,2	37	17,0	32	14,8	34
	15	10,3	37	8,9	39	14,8	35	12,9	37
	20	8,9	39	7,7	41	12,7	37	11,1	39
70/50 °C	0	14,8	30	12,8	32	21,1	27	18,5	29
	5	13,5	33	11,8	35	19,2	30	17,0	32
	10	12,1	35	10,6	38	17,4	33	15,3	35
	15	10,6	36	9,4	40	15,2	34	13,5	38
	20	9,4	40	8,1	42	13,4	38	11,8	40
80/60 °C	0	17,8	36	15,5	39	25,5	32	22,3	35
	5	16,5	39	14,5	42	23,8	35	20,9	39
	10	15,2	42	13,2	*44	21,7	38	19,0	41
	15	13,7	*44	11,9	*47	19,7	41	16,8	*43
	20	12,3	*47	10,7	*49	17,6	*44	15,5	*46
90/70 °C	0	21,0	42	18,2	*46	30,1	38	26,3	42
	5	20,2	*46	17,2	*49	28,3	41	24,9	*45
	10	18,3	*48	15,8	*51	26,2	*44	23,0	*48
	15	16,4	*50	14,6	*54	24,0	*47	21,1	*50
	20	15,1	*53	13,3	*56	22,0	*50	19,2	*53

1) Noise measurement DIN 45635 - 01 - KL 3

2) t_{L1} = incoming air temperature, t_{L2} = outgoing air temperature

* For outgoing air temperatures above 42 °C a very strong thermal lift can form. The penetration depth of the warm air stream becomes shorter, the cold air in the area where people are working cannot be adequately permeated and mixed by the warm air.

Temperature layers from bottom to top are the result. Pockets of cold air form in the area where people are working near the ceiling
Excessive buildup of heat (heat loss).

Technical Data PWW 5402 / PWW 5602

Type		2 steps				2 steps			
		5402		5602		5402		5602	
Speed	U/min.	670		500		660		500	
Electrical connection	Volt	3 x 400		3 x 400		3 x 400		3 x 400	
Frequency	Hz	50		50		50		50	
Power consumption	kW	0,16		0,095		0,35		0,21	
Rated current	A	0,38		0,19		0,78		0,39	
Air capacity	m ³ /h	3470		2500		5500		4200	
Sound pressure level L _{pA} 1m ¹⁾	dB(A)	57		50		60		53	
Max. heat projection range	m	4,0		2,9		4,6		3,4	
Heating medium connection	inch	R 1"		R 1"		R 1"		R 1"	
Weight	kg	39		39		46		46	
Heating Medium	t _{L1} °C	kW	t _{L2} °C	kW	t _{L2} °C	kW	t _{L2} °C	kW	t _{L2} °C
50/40 °C	0	19,9	18	17,0	21	27,1	15	24,1	17
	5	17,4	21	15,0	23	23,6	18	21,1	20
	10	14,9	24	12,8	26	20,2	22	18,0	23
	15	12,4	27	10,8	29	16,8	25	15,1	26
	20	9,9	29	8,7	31	13,6	28	12,2	29
60/50 °C	0	25,4	23	21,6	26	34,7	19	30,9	22
	5	22,9	26	19,7	29	31,1	23	27,8	25
	10	20,4	29	17,5	32	27,6	26	24,8	28
	15	17,8	32	23,2	34	23,9	29	21,6	31
	20	15,2	34	13,0	37	20,5	32	18,4	34
70/50 °C	0	25,3	22	21,7	26	27,1	15	24,3	17
	5	22,8	26	19,9	29	24,0	19	21,4	21
	10	20,3	29	17,8	32	20,9	22	18,6	24
	15	17,6	31	15,7	35	17,7	25	15,8	27
	20	15,6	35	13,7	38	15,0	29	13,1	30
80/60 °C	0	30,6	27	26,2	32	41,7	23	37,2	27
	5	28,1	30	24,4	35	38,3	27	34,2	30
	10	25,7	34	22,4	38	34,8	30	31,1	33
	15	23,2	37	20,2	41	31,4	34	28,0	36
	20	20,7	40	18,1	43	28,1	37	25,1	39
90/70 °C	0	36,1	32	30,9	37	49,5	28	44,0	32
	5	33,7	35	29,0	41	45,9	31	40,9	35
	10	31,2	39	25,9	*44	42,4	34	37,9	38
	15	28,7	42	24,8	*47	38,7	38	34,7	41
	20	26,2	*45	22,7	*49	35,3	41	31,7	*44

1) Noise measurement DIN 45635 - 01 - KL 3

2) t_{L1} = incoming air temperature, t_{L2} = outgoing air temperature

* For outgoing air temperatures above 42 °C a very strong thermal lift can form. The penetration depth of the warm air stream becomes shorter, the cold air in the area where people are working cannot be adequately permeated and mixed by the warm air. Temperature layers from bottom to top are the result. Pockets of cold air form in the area where people are working near the ceiling Excessive buildup of heat (heat loss).

SW 2 380 DI switching unit

Design

- ◇ Rotary current 400 Volt, fan 2-speed, maximum electrical capacity 4 kW
- ◇ On-plaster mount
- ◇ Full motor protection through integrated connections for thermal contacts
- ◇ Plastic housing, protection type IP 65, protective insulation in accordance with VDE
- ◇ Front plate with symbols for switching positions
- ◇ Power input and protective conductor terminals, main contactor
- ◇ Control fuse, control switch with the functions "Off/Speed 1/Speed 2"
- ◇ Operating light (goes out when there is a fan malfunction and/or power interruption to the switching unit)
- ◇ Reset button, motor output terminals, connection terminals for thermal contacts and room thermostat.

Group switching

The switching unit is suitable for group switching. Several motors wired the same way can be connected to one switching unit.

The total capacity of the connected motors may not exceed the permissible switch capacity of the switching unit. The thermal contacts of all motors are to be connected in a row.

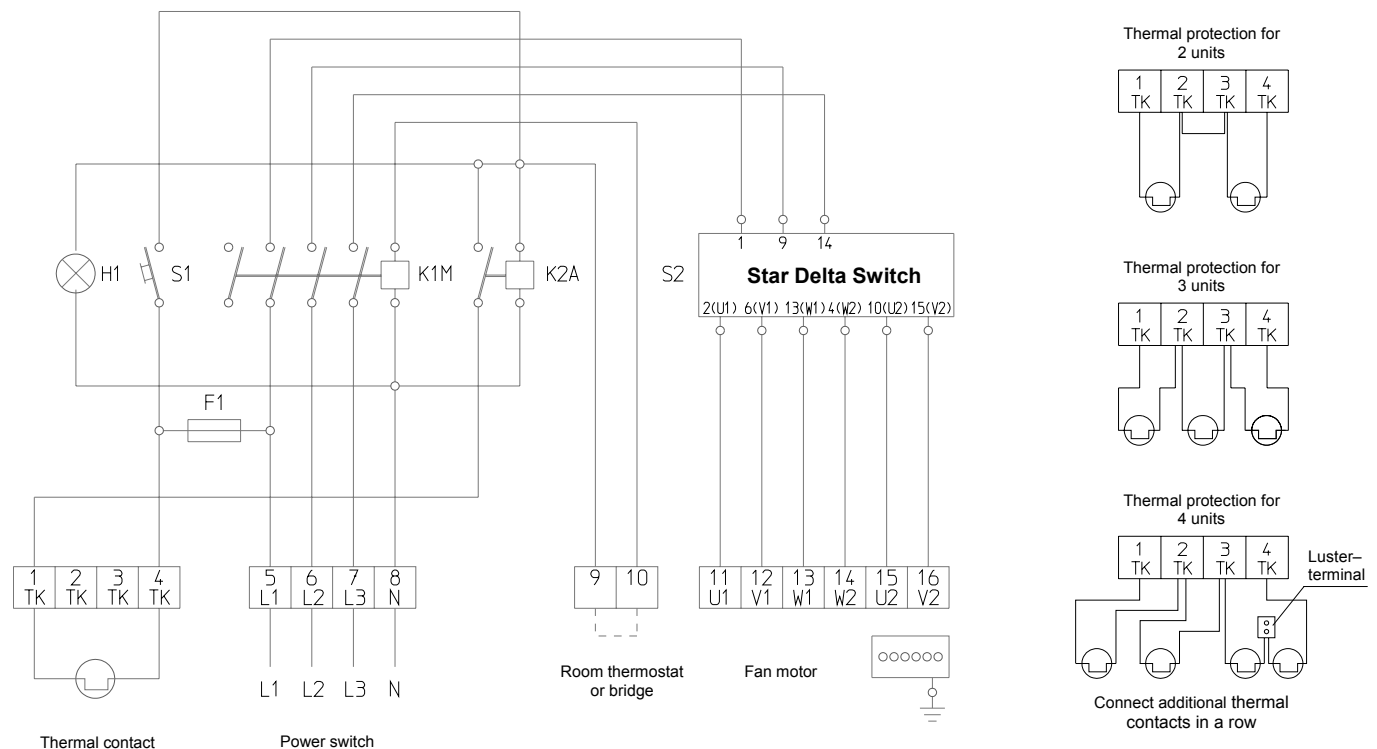
See figure below.

Switching on again after a problem

- ◇ Each time the power supply is interrupted or the fan malfunctions, the fan reset button has to be pressed once.

Grounding and earthing or protective wiring and fuse protection must be done by the customer in accordance with the requirements of the VDE as well as the responsible EVU.

Wiring diagram



Legend

- | | | | | | |
|----|------------------|-----|------------------------|----|-----------------|
| S1 | Fan reset button | K2A | Auxiliary relay | F1 | Control fuse |
| S2 | Control switch | K1M | Contactor to fan motor | H1 | Operating light |

We reserve the right to make changes to dimensions and design in the interest of technical progress.

REMKO GmbH & Co. KG

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