Electrical wiring

REMKO series WKF NEO-compact

Smart heat pumps
Air/water system for heating or cooling

WKF NEO-compact 70, WKF NEO-compact 120, WKF NEO-compact 180

Instructions for Technicians

0188-2019-04 Edition 3, en_GB

Read the instructions prior to performing any task!

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

1.1 General safety notes

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

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

1.2 Identification of notes

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

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

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

DANGER!

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

DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE!

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

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

1.3 Personnel qualifications

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

1.4 Dangers of failure to observe the safety notes

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

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

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

1.5 Safety-conscious working

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

1.6 Safety notes for the operator

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

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

1.7 Safety notes for installation, maintenance and inspection

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

1.8 Unauthorised modification and changes

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

1.9 Intended use

Depending on the model, the equipment and the additional fittings with which it is equipped is only intended to be used as an air-conditioner for the purpose of cooling or heating the air in an enclosed room.

Any different or additional use shall be classed as non-intended use. The manufacturer/supplier assumes no liability for damages arising from such 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.

Under no circumstances should the threshold values specified in the technical data be exceeded.

1.10 Warranty

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

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

1.11 Transport and packaging

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

⚠ WARNING!

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

Why:

- Leave packaging material are not around.

- Packaging material may not be accessible to children!

1.12 Environmental protection and recycling

Disposal of packaging

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

Disposal of equipment and components

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

2 Electrical wiring

2.1 System layout WKF NEO 70

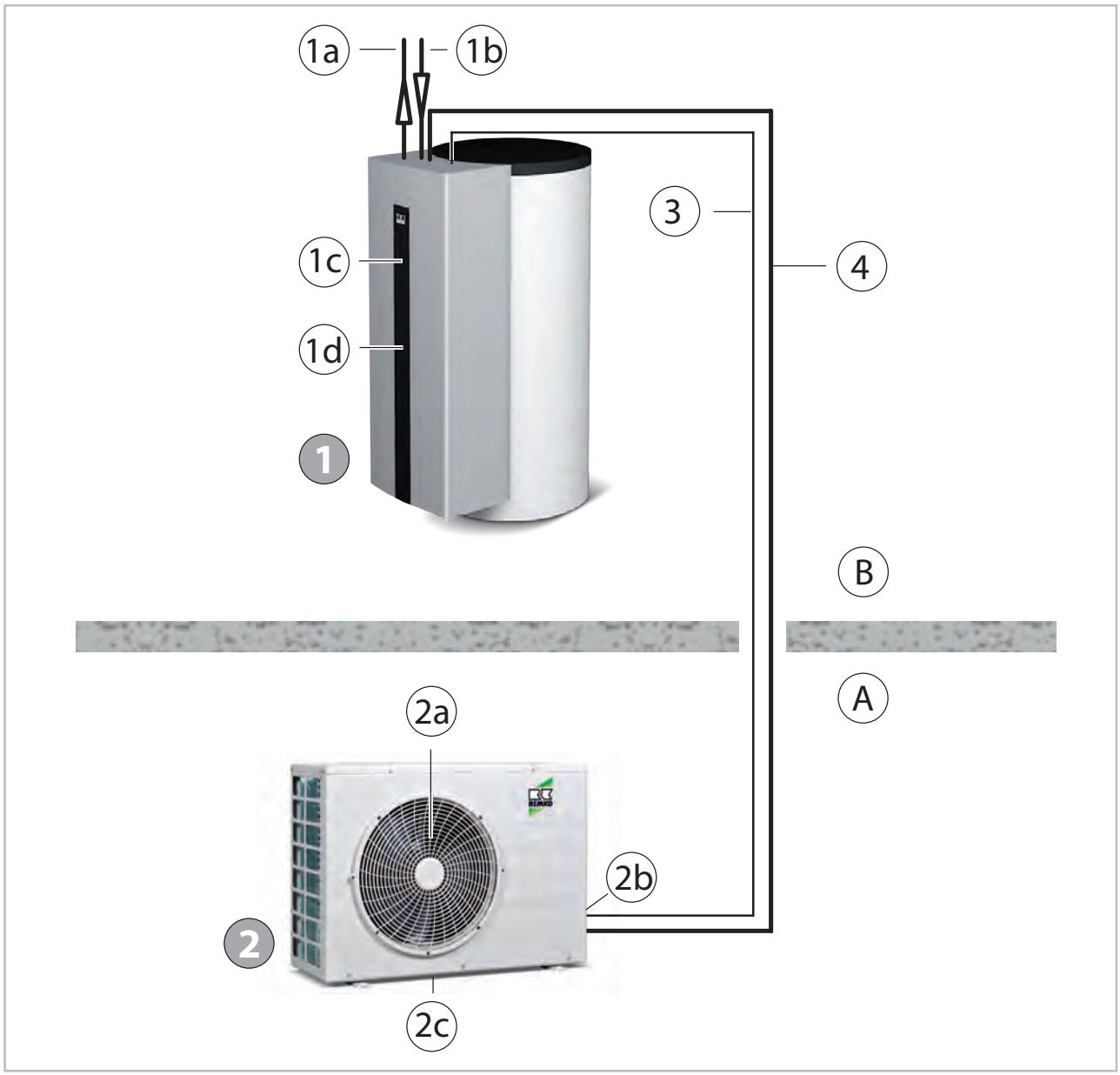


Fig. 1: System layout WKF NEO 70

A: Outdoor area
B: Indoor area
1: Indoor unit
1a: Heating inlet flow ($1^1/_4$" AG)
1b: Heating return flow ($1^1/_4$" AG)
1c: Power supply, indoor unit
= 230V/1~/50Hz, 10A (e.g. 3 x 1.5 mm²)
1d: Mains supply line, electrical auxiliary heater
(e.g. 5 x 1.5 mm²)
2: Outdoor unit
2a: Fan
2b: Power supply, outdoor unit
= 230V/1~/50Hz, 16A (e.g. 3 x 2.5 mm²)
2c: Condensate tray, outdoor unit
(drain must be designed to be frost proof!)
3: Control line, sheathed (e.g. 2 x 1 mm²)
4: Refrigerant lines $^3/_8$" and $^5/_8$“

2.2 System layout WKF NEO 120

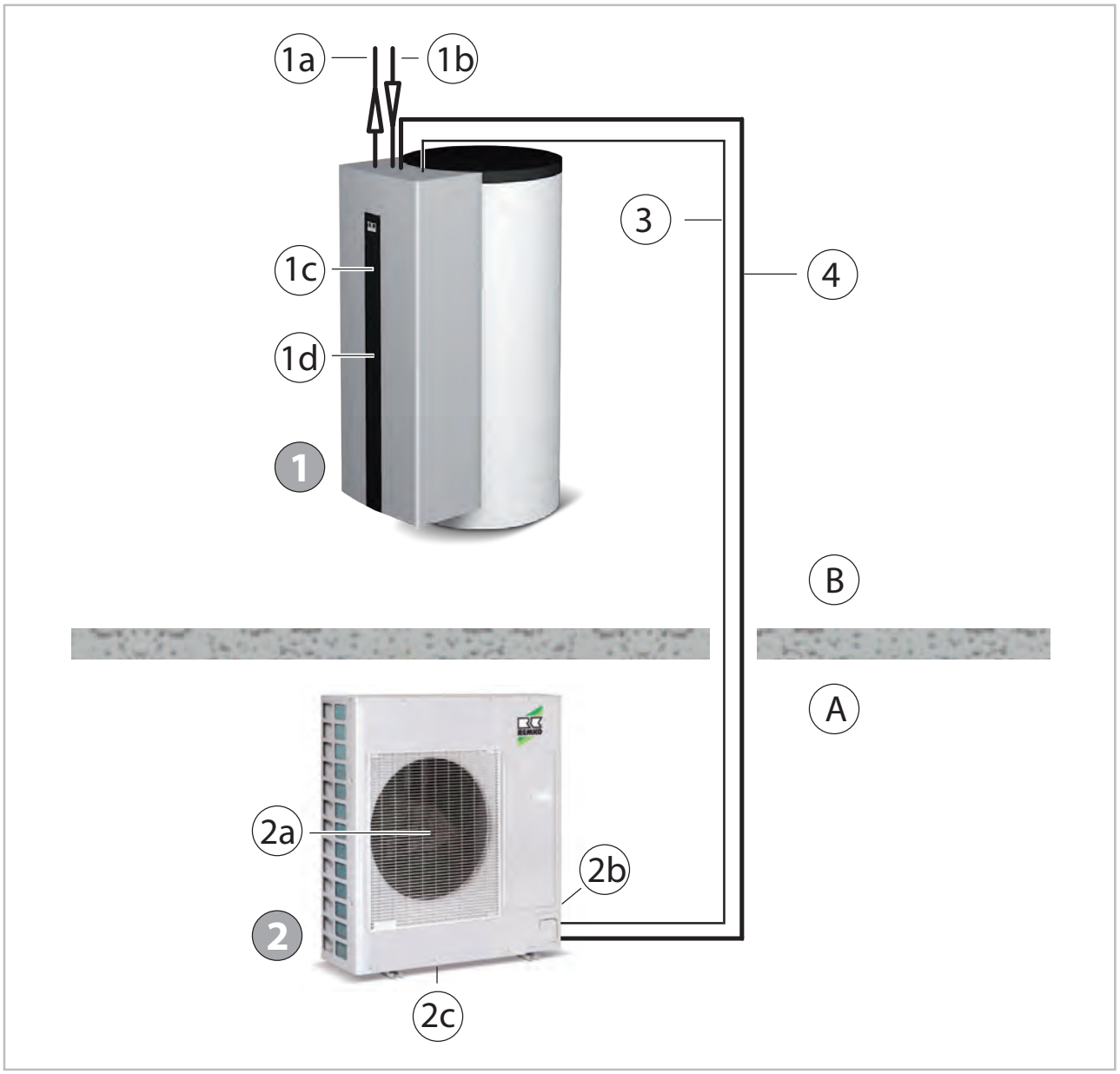


Fig. 2: System layout WKF NEO 120

A: Outdoor area
B: Indoor area
1: Indoor unit
1a: Heating inlet flow ($1^1/_4$" AG)
1b: Heating return flow ($1^1/_4$" AG)
1c: Power supply, indoor unit
= 230V/1~/50Hz, 10A (e.g. 3 x 1.5 mm²)
1d: Mains supply line, electrical auxiliary heater
(e.g. 5 x 1.5 mm²)
2: Outdoor unit
2a: Fan
2b: Power supply, outdoor unit
= 230V/1~/50Hz, 20A (e.g. 3 x 2.5 mm²)
2c: Condensate tray, outdoor unit
(drain must be designed to be frost proof!)
3: Control line, sheathed (e.g. 2 x 1 mm²)
4: Refrigerant lines $^3/_8$" and $^5/_8$“

2.3 System layout WKF NEO 180

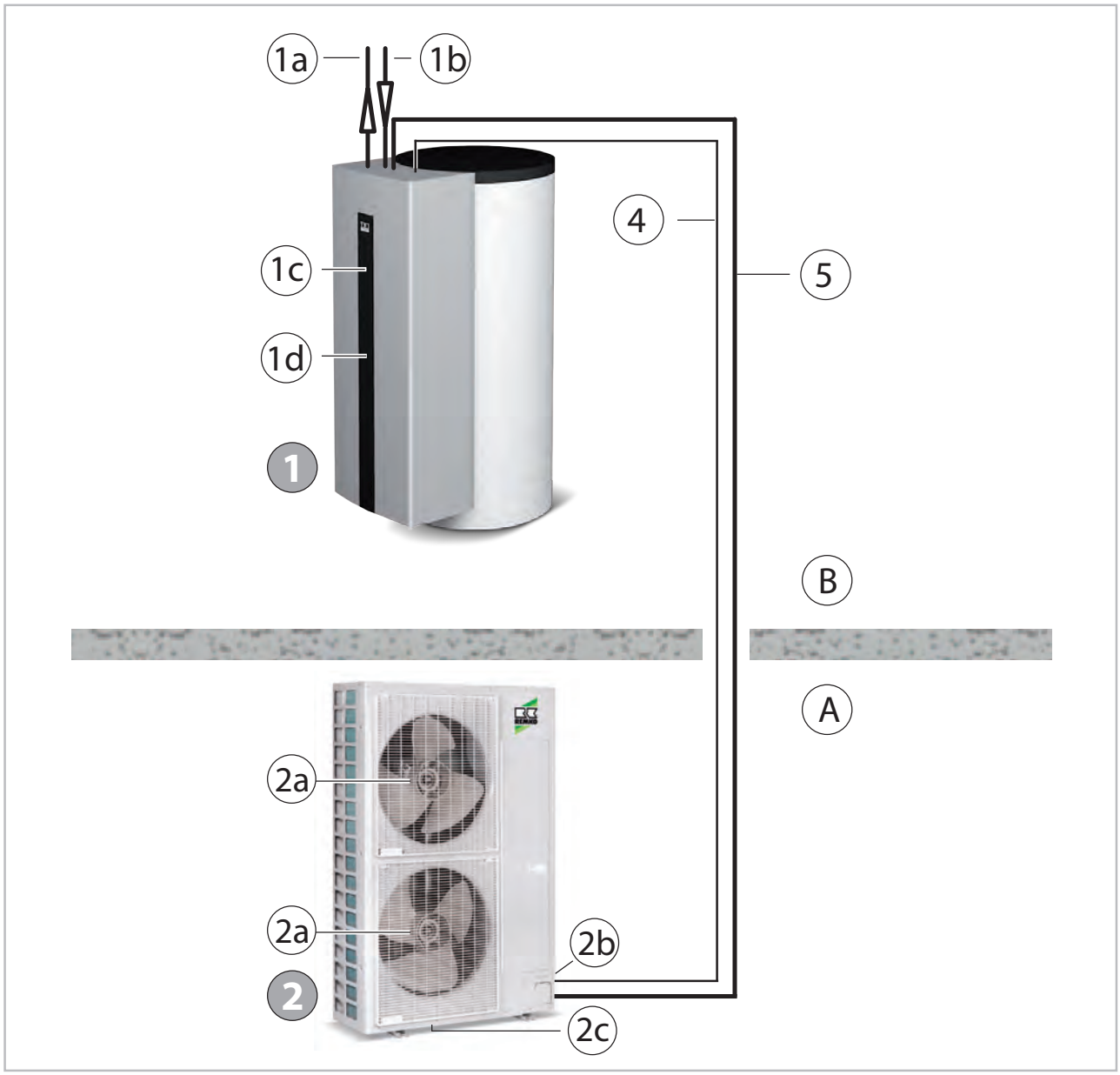


Fig. 3: System layout WKF NEO 180

A: Outdoor area
B: Indoor area
1: Indoor unit
1a: Heating inlet flow ($1^1/_4$" AG)
1b: Heating return flow ($1^1/_4$" AG)
1c: Power supply, indoor unit
= 230V/1~/50Hz, 10A (e.g. 3 x 1.5 mm²)
1d: Mains supply line, electrical auxiliary heater
(e.g. 5 x 1.5 mm²)
2: Outdoor unit
2a: Fan
2b: Power supply, outdoor unit
= 400V/3~/50Hz, 3 x 16A (e.g. 5 x 1.5 mm²)
2c: Condensate tray, outdoor unit
(drain must be designed to be frost proof!)
3: Control line, sheathed (e.g. 2 x 1 mm²)
4: Refrigerant lines $^3/_8$" and $^5/_8$“

The indoor and outdoor units have to be connected with refrigerant lines of dimensions (outer diameter) $^{3}/_{8}$"(=9.52 mm) and $^{5}/_{8}$"(=15.88 mm). At least a two-wire control line has to be laid between the two modules. Both the indoor and outdoor units require a separate power supply.

⚠ WARNING!

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

2.4 Overview of electrical cables

WKF NEO 70 and WKF NEO 120

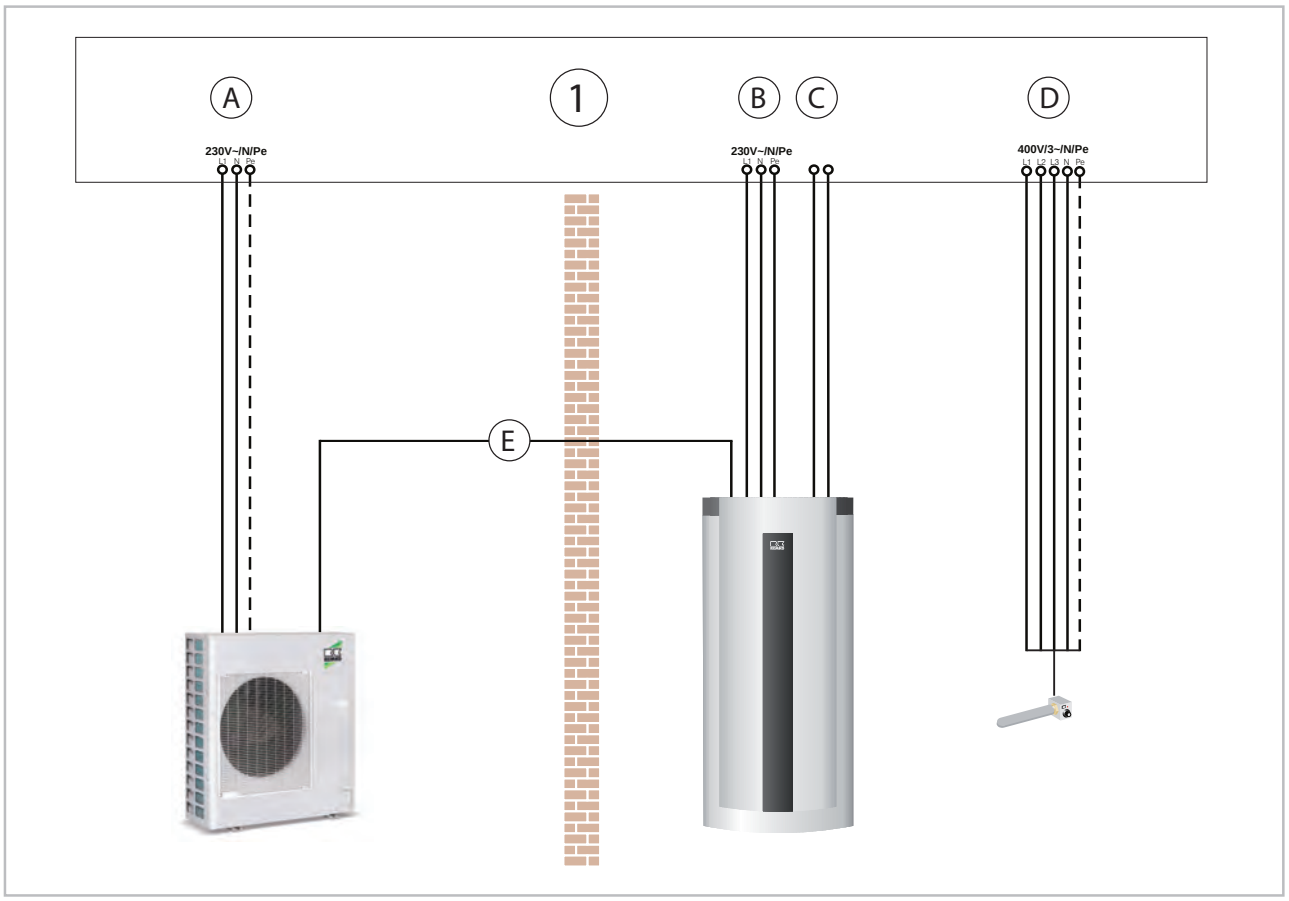


Fig. 4: Overview of electrical cables

1: Main distribution
A: Power supply outdoor unit
B: Power supply indoor unit
C: Power utility disable signal, potential-free / open = locked
D: Power supply heating coil, 6 kW indoor unit
E: Communication F1/F2 outdoor unit / indoor unit 2 x 1 mm^2 sheathed

WKF NEO 180

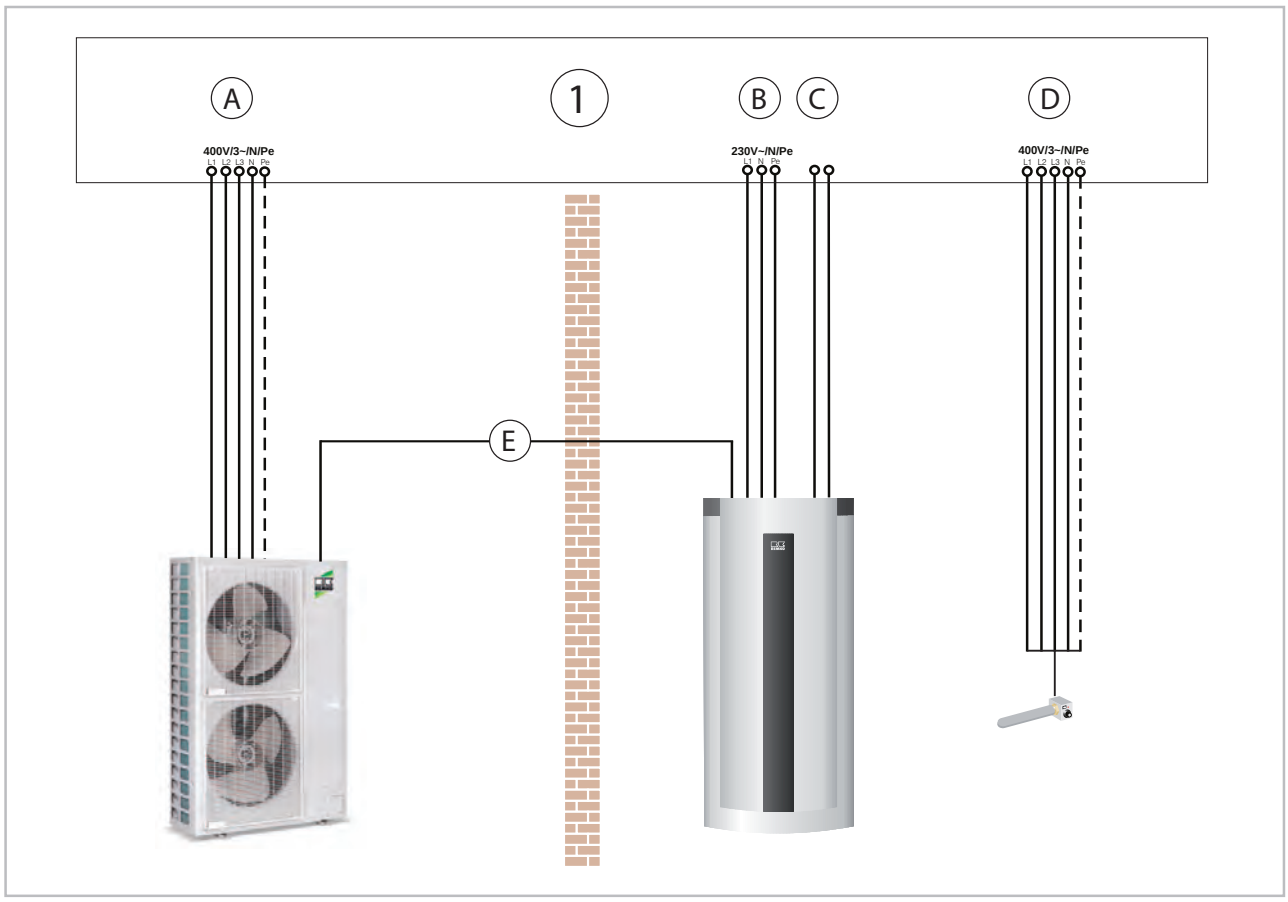


Fig. 5: Overview of electrical cables

1: Main distribution
A: Power supply outdoor unit
B: Power supply indoor unit
C: Power utility disable signal, potential-free / open = AM locked
D: Power supply heating coil, 6 kW indoor unit
E: Communication F1/F2 outdoor unit / indoor unit 2 x 1 mm^2 sheathed

2.5 Electrical connection general notes

- It is necessary to lay a mains cable both to the outdoor unit and, separately, to the indoor unit.
- Power to the indoor units may not be disconnected by the power company when fitted with an off-period circuit (anti-freeze protection).
- The indoor unit requires a single-phase 230V / 50Hz power supply.
  The outdoor units of the WKF NEO 70 and WKF NEO 120 require a 230V / 50Hz power supply.
  The outdoor unit of the WKF NEO 180 requires a three-phase 400V / 50Hz power supply.
- The electrical connection between outdoor and indoor units is made using a sheathed three-wire control line.
- Where applicable, a separate power supply shall be provided to the indoor unit for the auxiliary heater.
- The heat-pump manager needs to know whether a power-company enable or off-period is in effect. A potential-free switch must be provided by the customer for this purpose. (Contact closed signifies enabled, while contact open signifies a blocking period).
- A connection schematic along with corresponding circuit diagrams can be found in the “Electrical layout” and “Circuit plans” chapters of this manual.
- Special rates for the operation of heat pumps may be offered by the power-company (utility).
- Ask your local power utility about the details of any rates that might be available.

DANGER!

All electrical installation work must be done by an electrician.

WARNING!

Always note the currently applicable VDE guidelines and the notes in TAB 2007. The size and type of the fuse are to be taken from the technical data.

WARNING!

All cable sizes are to be selected according to VDE 0100. Special attention should be given to cable lengths, cable type and the kind of installation. The information in the connection diagram and in the system overview are to be seen as an acceptable installation possibility only in a standard case!

NOTICE!

Make sure to connect the outdoor unit neutral connector properly, otherwise the varistors on the line-filter circuit board will be destroyed.

NOTICE!

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

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

2.6 Electrical connection - indoor unit

The following instructions describe the electrical connection of the indoor units.

1. Remove the housing from the upper section by pressing it upwards and pulling it forwards out of the rear groove.
2. Guide the supply cable to the indoor units through the cable openings, and also route the control line between indoor and outdoor units and the cables for external devices and probes into the indoor unit. Note that the cable openings in the WKF NEO 120 series are located above rather than below.
3. Connect the mains cable line of the indoor units to the terminals.
4. Connect all secondary consumers (HGM,HGU, changeover valves etc.) to the I/O module.

! NOTICE!

Attach cables in accordance with the connection schematic and/or the circuit diagram in the control box.

! NOTICE!

Ensure correct polarity when connecting the electrical leads, especially the control cable.

The number of lines and the sensors is dependent on the configuration of the heating system and the components.

Make sure to use enough cable when installing the indoor unit so that the control box can be fully lowered for future maintenance.

At the site, avoid adding cable inlets.

2.7 Electrical connection - outdoor unit

- To connect up the electrics, remove the right cladding panel after unfastening the screws.

Fig. 6: Series WKF NEO 70 and WKF NEO 120 - remove the cover by unfastening the screw

1: Screw

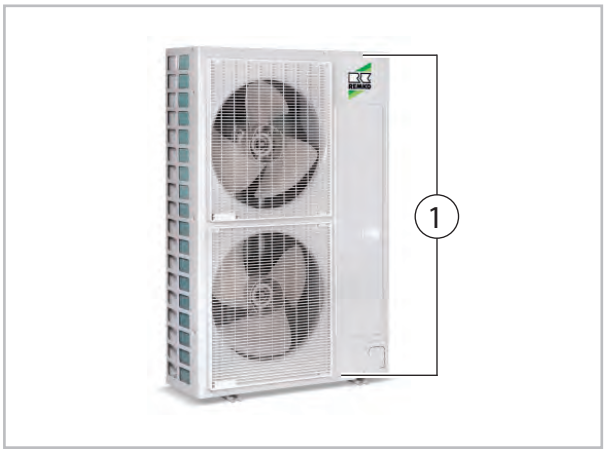


Fig. 7: Series WKF NEO 180 - remove the trim panel by unfastening the screws

1: Screw

- Electrical protection for the system is implemented in accordance with the information in the Technical Data. Observe the required conductor cross-sections!
- All cables must be connected with the correct polarity and strain relief.
- Follow the connection schematic and the circuit diagrams.
- The two-wire control line is to be connected to terminals F1, F2 and the earth terminal.

- When connecting the control line, make sure that polarity is correct.
- If the outdoor unit is installed on a roof, it and the supporting structure must be earthed separately (connection to lightning conductors or foundation earth/ground feature).
- With the series WKF NEO 180, make sure that only terminals L1(R), L2(S), L3(T) and N are connected (see Fig. 10).

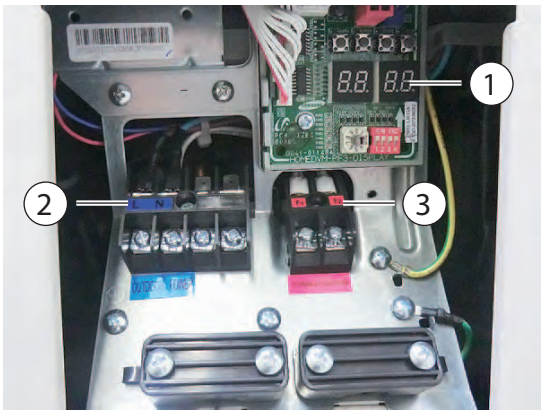


Fig. 8: Connection terminals outdoor unit WKF NEO 70

1: Display
2: Mains connection 230V/1~ /50Hz
3: Control line F1/F2

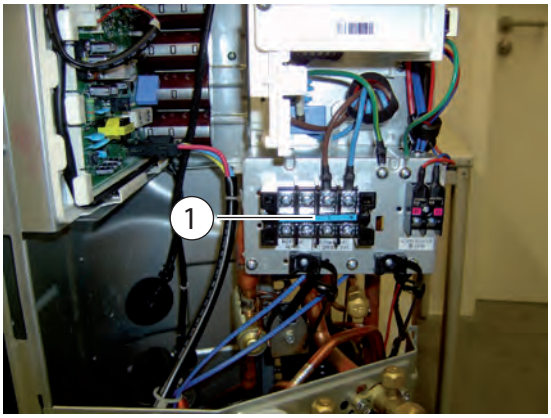


Fig. 9: Connection terminals outdoor unit WKF NEO 120

1: Mains connection 230V/1~ /50Hz

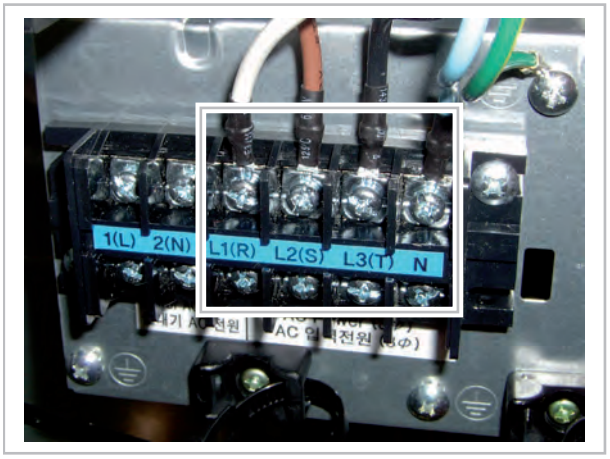


Fig. 10: Connection terminal outdoor unit WKF NEO 180

! NOTICE!

Make sure to connect the outdoor unit neutral connector properly, otherwise the varistors on the line-filter circuit board will be destroyed.

Temperature probes

- The number of probes required can vary with the type of system.
- Observe the relevant notes for the probe position found in the hydraulic circuit diagram.
- The standard scope of delivery includes the outdoor probes (S10), an immersion probe (provided for use as a domestic hot water probe - (S08) as well as a probe for the complete inlet in the indoor unit.
- When connecting up a solar plant, use a PT-1000 probe (S01) as a collector probe and a PT-1000 probe (S02) as the lower storage tank probe.
- All probes are to be connected to the indoor units switch cabinet in accordance with the terminal assignment diagram.

Contact probe

Contact probes can be mounted on the pipes, to measure the heating-circuit temperatures, for example.

- The contact probes are fastened to a pipe with the trapezoidal brackets and retaining strap provided.
- Clean the appropriate point. Subsequently a thermal compound [A] is applied and the probe is fixed in position.

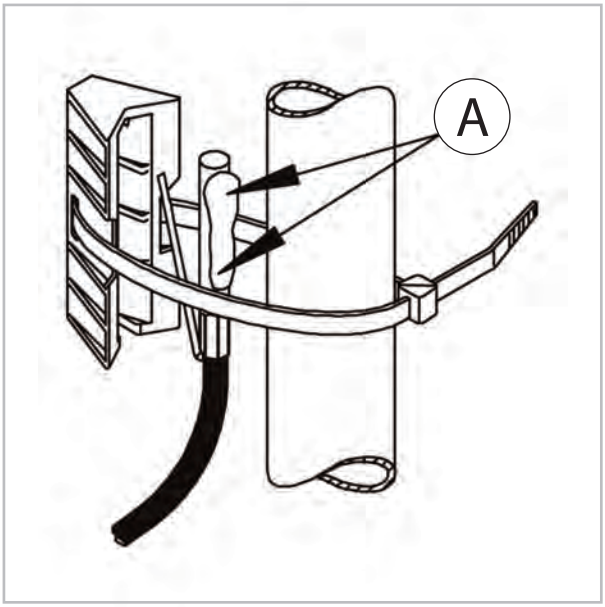


Fig. 11: Securing the inductive sensor

If the sensor cables are too short, they can be extended up to a maximum of 100m with wire having a cross-section of 1.5 mm².

External probe

The connection of an outdoor sensor is always required for Smart Control Touch.

- Mount the external probe pointing skyward, in a north-easterly direction, about 2.5 metres above the ground. It may not be subjected to direct sunlight and is to be protected against excessive wind. Installation above windows or air ducts is to be avoided.
- In order to carry out the installation, remove the cover and secure the probe with the screw provided.
- A cable with a wire cross-section of min. 0.5 mm^2 provided by the customer is recommended for connecting the probe.

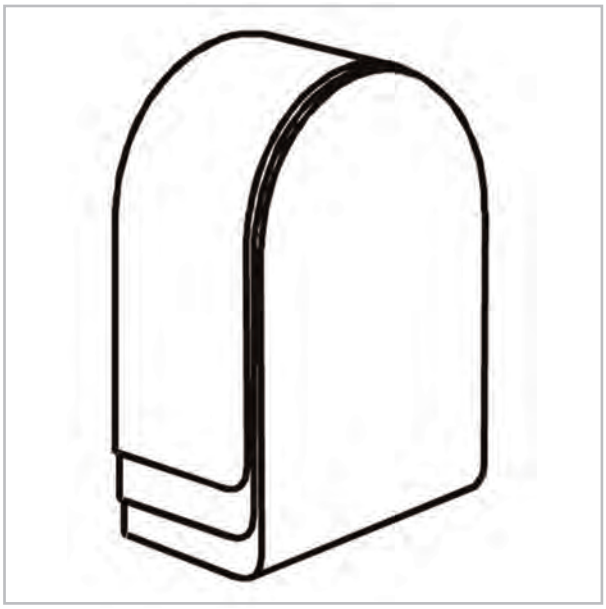
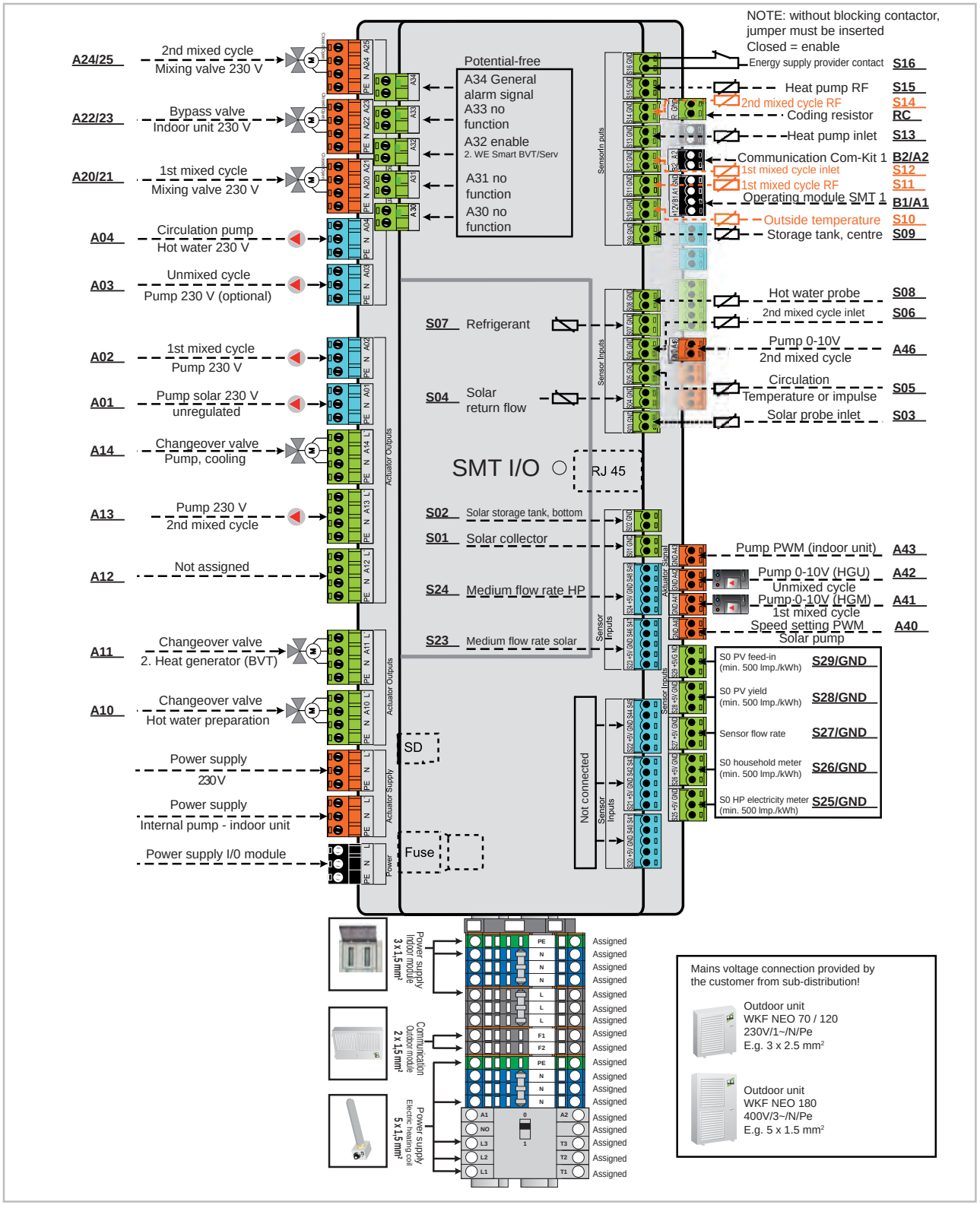


Fig. 12: External probe

REMKO series WKF NEO-compact

2.8 Electrical configuration - I/O module - WKF NEO compact 70/120/180

Use wire gauge corresponding with the connection cable supplied!
Lay load lines separately to measuring lines!



2.9 Terminal assignment / legend - WKF NEO compact 70/120/180

Designation	Input	Output	Signal	Description
PW	X			Power supply I/O module 230V
PP		X		Power supply primary pump, indoor unit
S01	X			Solar probe collector
S02	X			Solar probe storage tank, bottom
S03	X			Solar probe inlet HM solar
S04	X			Solar probe RF HM solar
S05	X			Circulation RF temp./impulse
S06	X			2nd mixed cycle inlet probe
S07	X			Probe refrigerant piping
S08	X			Domestic hot-water tank
S09	X			Probe storage tank centre (storage energy acquisition)
S10	X			External probe
S11	X			1st mixed cycle return flow probe
S12	X			1st mixed cycle inlet probe
S13	X			Heat pump inlet
S14	X			2nd mixed cycle return flow probe
S15	X			Heat pump RF
S16	X			Energy supplier contact (NC) / dew point monitoring (external)
S20	X			Not connected
S21	X			Not connected
S22	X			Not connected
S23	X			Ultrasonic flow rate meter Solar, pulse rate
S24	X			Ultrasonic flow rate meter HP, impulse rate
S25	X			HP electricity meter S0
S26	X			Household electricity S0
S27	X			Flow probe
S28	X			PV yield electricity meter S0
S29	X			PV in-feed electricity meter S0
A01		X		Solar pump unregulated (230 V)
A02		X		1st mixed cycle, pump (230 V) switched
A03		X		Unmixed cycle, pump (230 V) switched
A04		X		Circulation pump
A10		X		Changeover valve, drinking water

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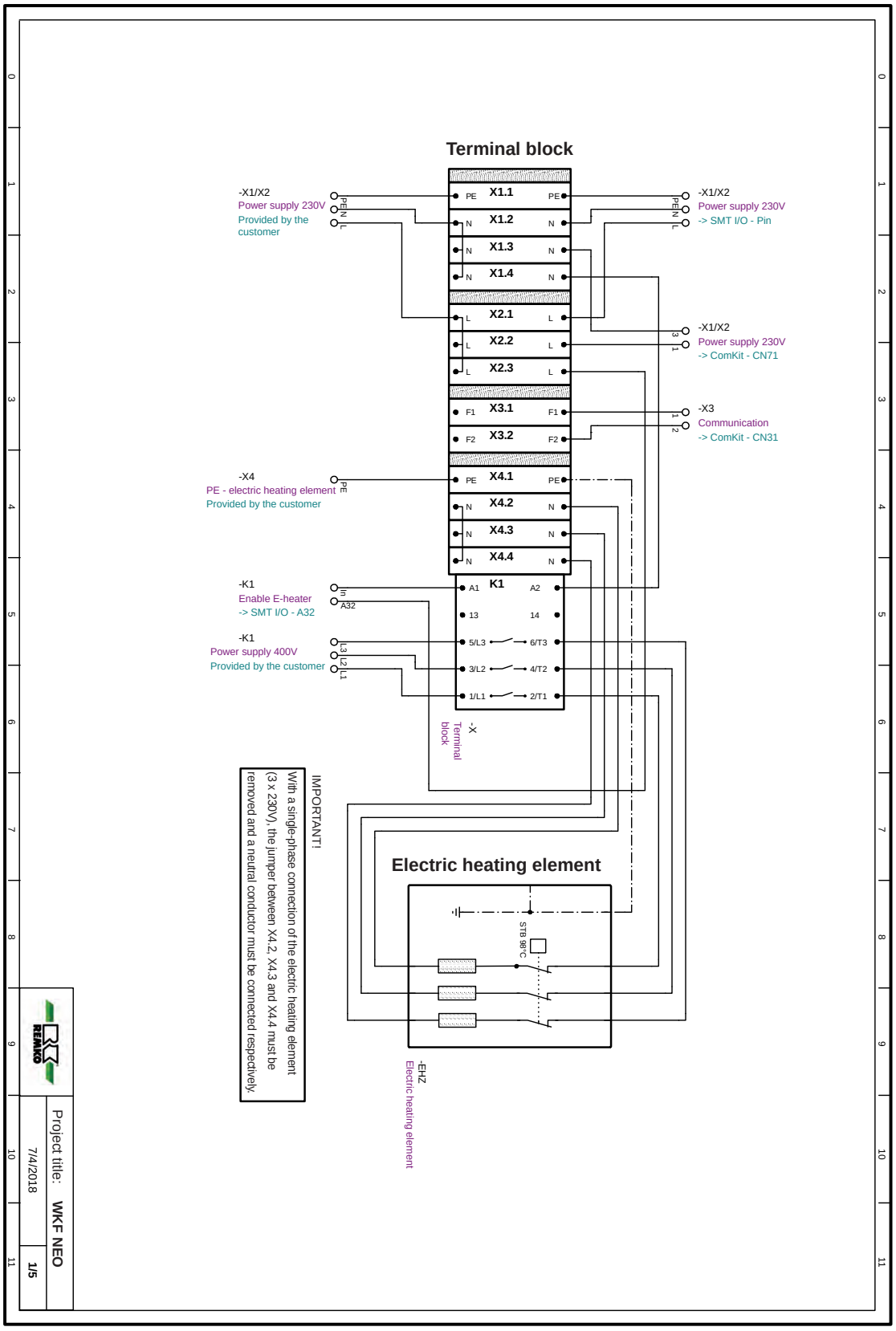
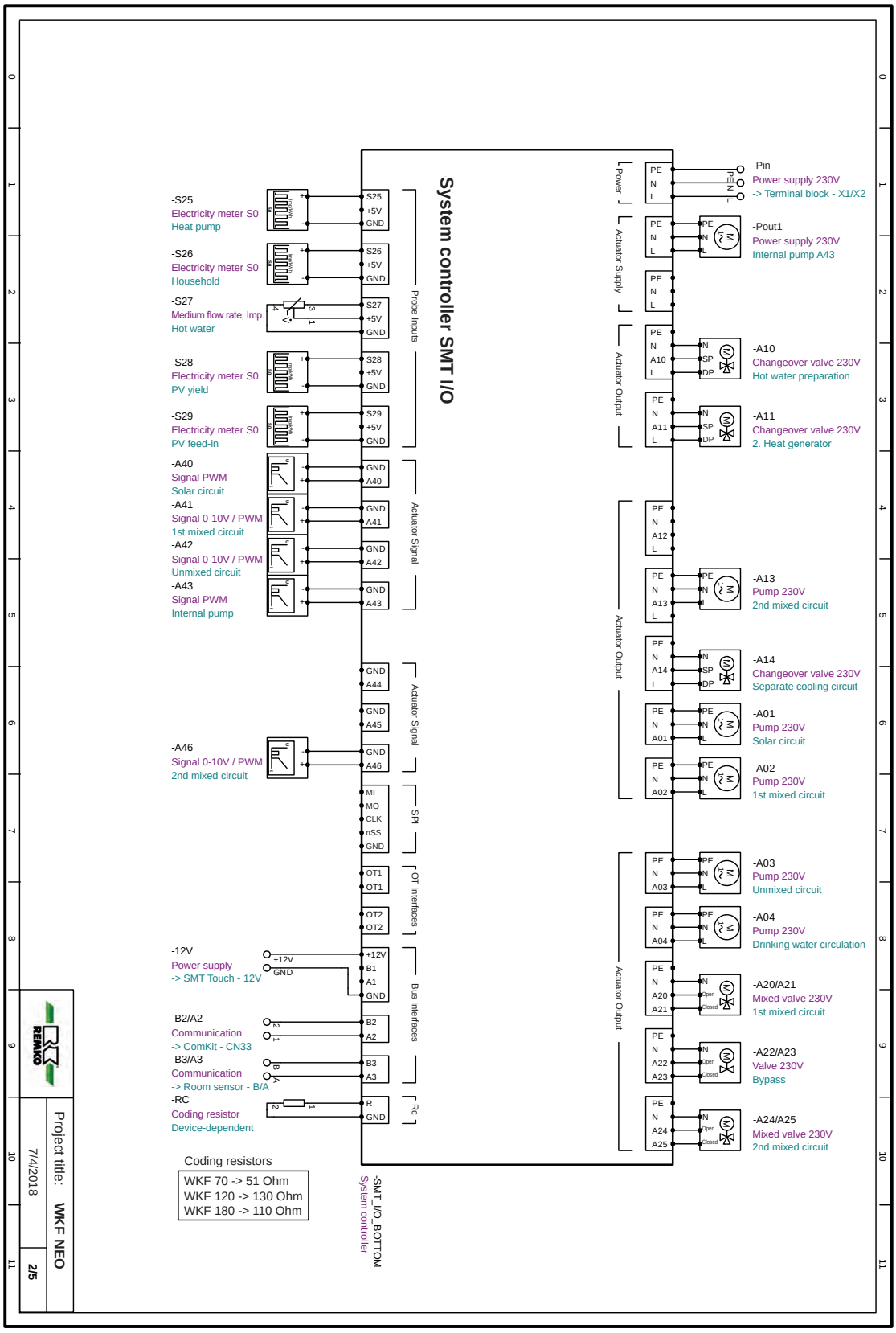
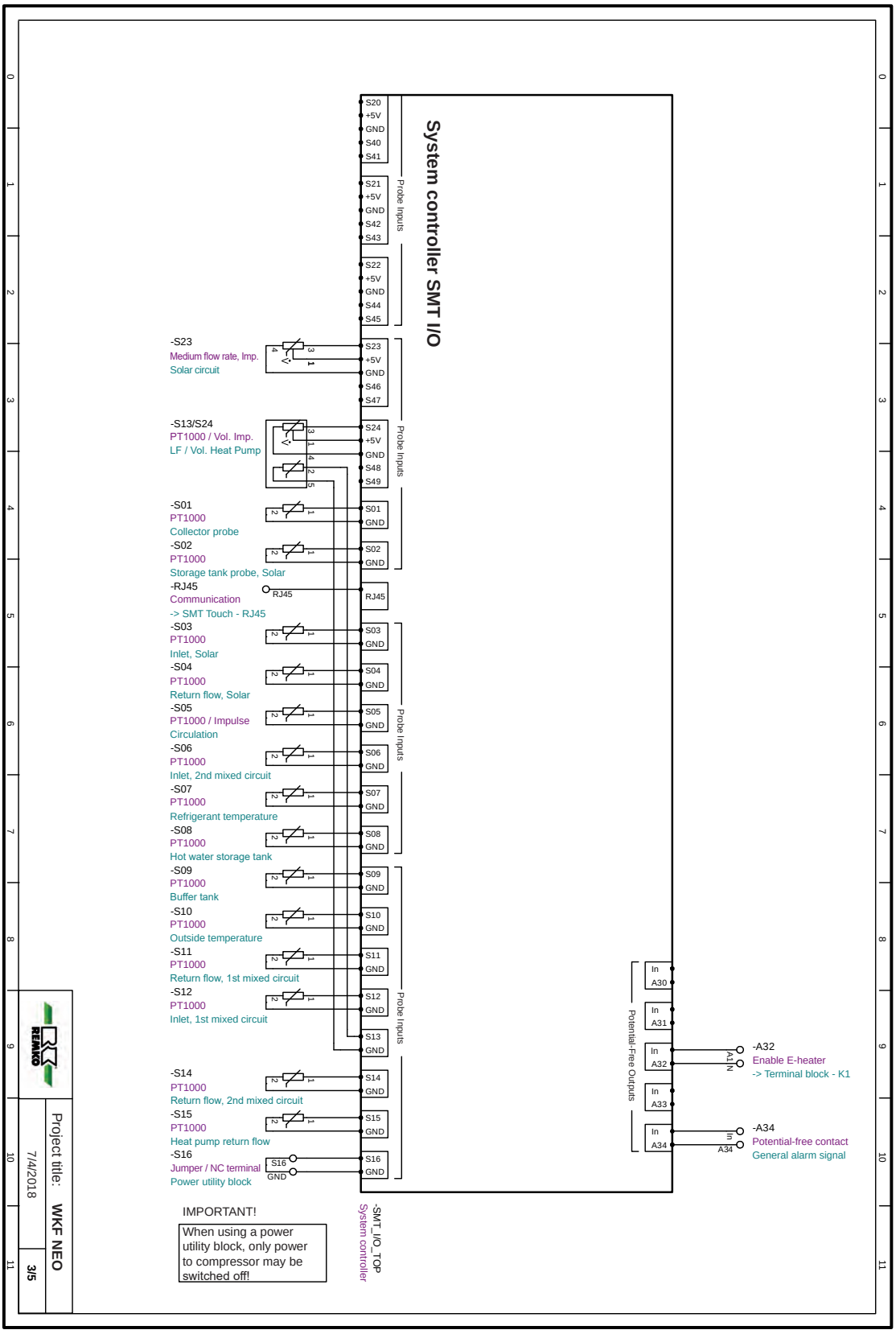
Designation	Input	Output	Signal	Description
A11		X		Changeover valve 2nd WE
A12		X		Changeover valve solar / 2 storage tank pool
A13		X		2nd mixed cycle, pump (230 V) switched
A14		X		Changeover valve / pump cooling
A20		X		1st mixed cycle, mixing valve open (230 V)
A21		X		1st mixed cycle, mixing valve switched to closed (230 V)
A22		X		Bypass mixer open
A23		X		Bypass mixer closed
A24		X		2nd mixed cycle, mixing valve open (230 V)
A25		X		2nd mixed cycle, mixing valve switched to closed (230 V)
A30		X		Not connected
A31		X		Not connected
A32		X		Enable 2 WE booster heating or boiler
A33		X		Not connected
A34		X		Alarm codes
A40			X	Speed setting solar pump PWM
A41			X	Speed specification, 1st mixed circuit (0-10V)
A42			X	Speed specification, unmixed circuit (0-10V)
A43			X	Speed setting primary pump indoor unit (PWM)
A44			X	Not connected
A45			X	Non functional
A46			X	Speed specification, 2nd mixed circuit (0-10V)
MI				Non functional
MO				
CLK				
nSS				
GND				
OT 1 (2x)				Not connected
OT 2 (2x)				Non functional
B1, A1 +12 Volt, GND				Operating module
B2 / A2				Communication Com-Kit
B3 / A2				RS 485_3
R				RC coding resistance WKF NEO compact 70/120/180

2.10 Circuit diagrams - WKF NEO compact 70/120/180

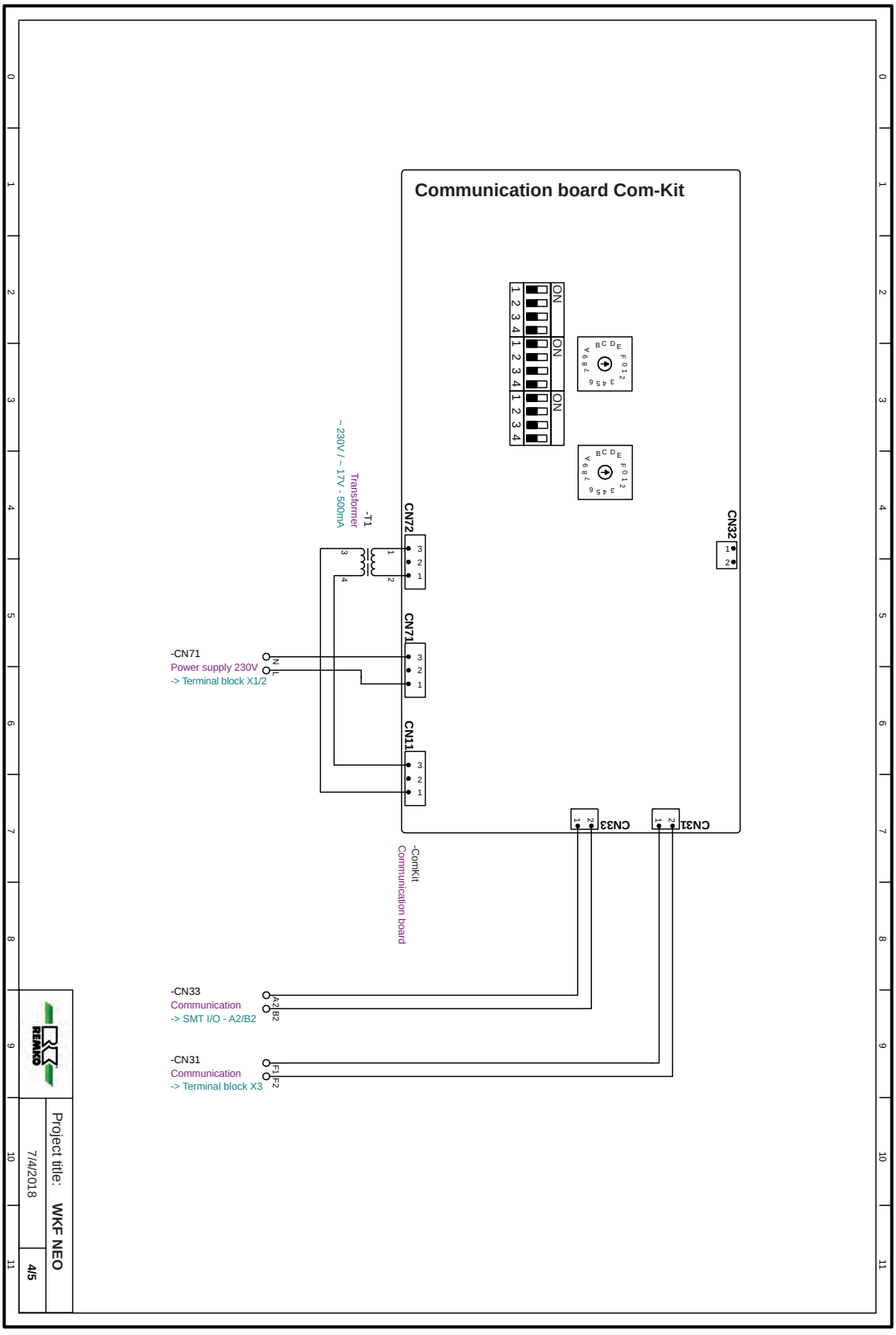


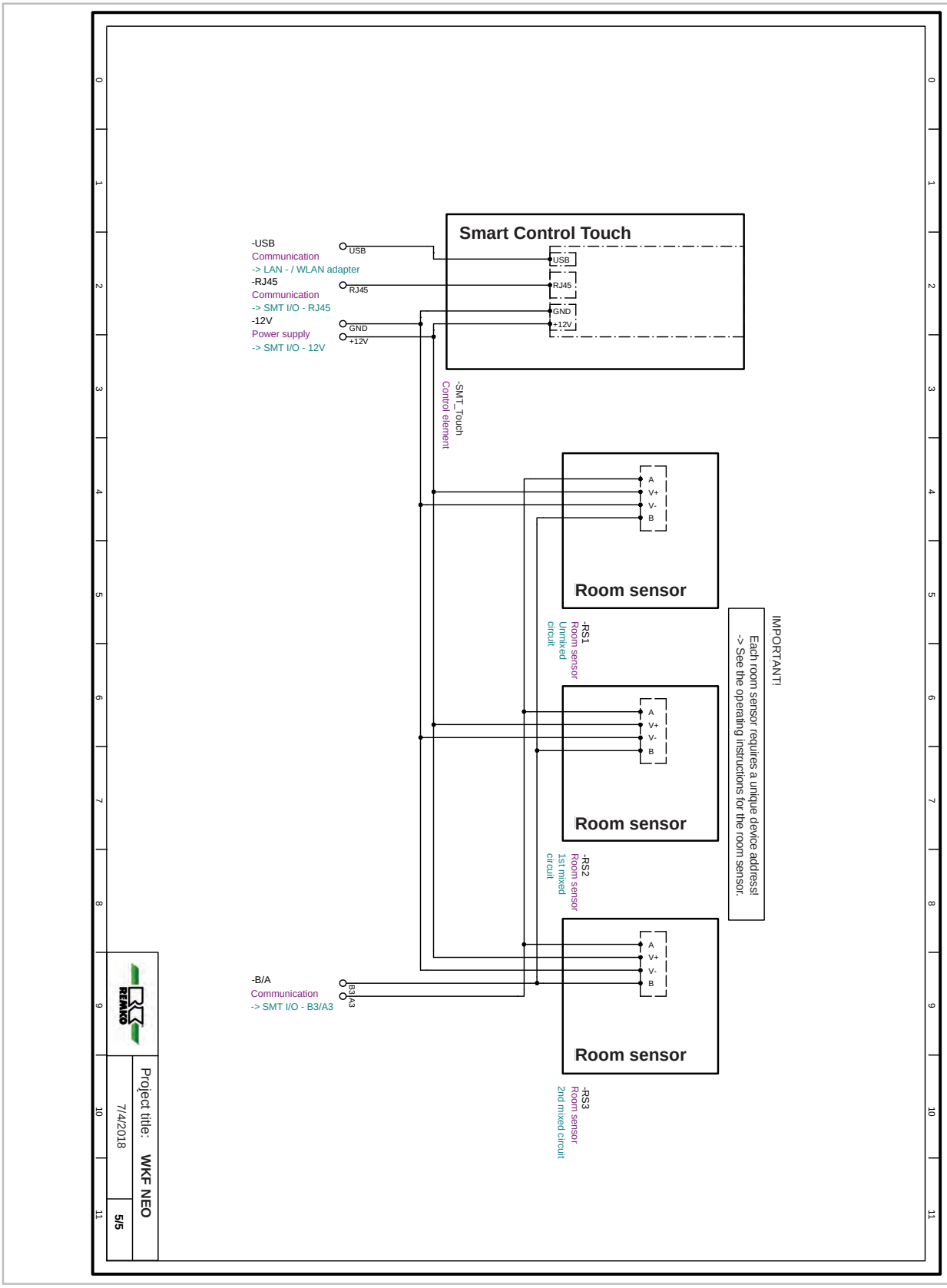
REMKO series WKF NEO-compact




System controller SMT I/O
Probe Inputs
Potential-Free Outputs
-S23
Medium flow rate, Imp.
Solar circuit
-S13/S24
PT1000 / Vol. Imp.
LF / Vol. Heat Pump
-S01
PT1000
Collector probe
-S02
PT1000
Storage tank probe, Solar
-RJ45
Communication
-> SMT Touch - RJ45
-S03
PT1000
Inlet, Solar
-S04
PT1000
Return flow, Solar
-S05
PT1000 / Impulse
Circulation
-S06
PT1000
Inlet, 2nd mixed circuit
-S07
PT1000
Refrigerant temperature
-S08
PT1000
Hot water storage tank
-S09
PT1000
Buffer tank
-S10
PT1000
Outside temperature
-S11
PT1000
Return flow, 1st mixed circuit
-S12
PT1000
Inlet, 1st mixed circuit
-S14
PT1000
Return flow, 2nd mixed circuit
-S15
PT1000
Heat pump return flow
-S16
Jumper / NC terminal
Power utility block
-A32
Enable E-heater
-> Terminal block - K1
-A34
Potential-free contact
General alarm signal
IMPORTANT!
When using a power utility block, only power to compressor may be switched off!
-SMT_I/O_TOP
System controller
Project title: WKF NEO
7/4/2018
3/5

REMKO series WKF NEO-compact




Smart Control Touch
USB
RJ45
GND
+12V
-USB
Communication
-> LAN - / WLAN adapter
-RJ45
Communication
-> SMT I/O - RJ45
-12V
Power supply
-> SMT I/O - 12V
-SMT_Touch
Control element
Room sensor
A
V+
V-
B
-RS1
Room sensor
Unmixed
circuit
-RS2
Room sensor
1st mixed
circuit
-RS3
Room sensor
2nd mixed circuit
IMPORTANT!
Each room sensor requires a unique device address!
-> See the operating instructions for the room sensor.
-B/A
Communication
-> SMT I/O - B3/A3
B3
A3
Project title: WKF NEO
7/4/2018
5/5

REMKO series WKF NEO-compact

Legend for the circuit diagrams

Abbreviations:

EVU:	Electrical power company / power utility
Gem.:	Mixed
Imp.:	Impulse
Öffner-K.	NC contact
PV:	Photovoltaic
PWM:	Pulse width modulation
RL:	Return flow
Ungem.:	Unmixed
VL:	Inlet
Vol.	Medium flow rate

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REMKO series WKF NEO-compact

REMKO QUALITY WITH SYSTEMS

Air-Conditioning | Heating | New Energies

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Klima- und Wärmetechnik

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