



ELECTRICAL CIRCULAR DUCT HEATERS

EKA



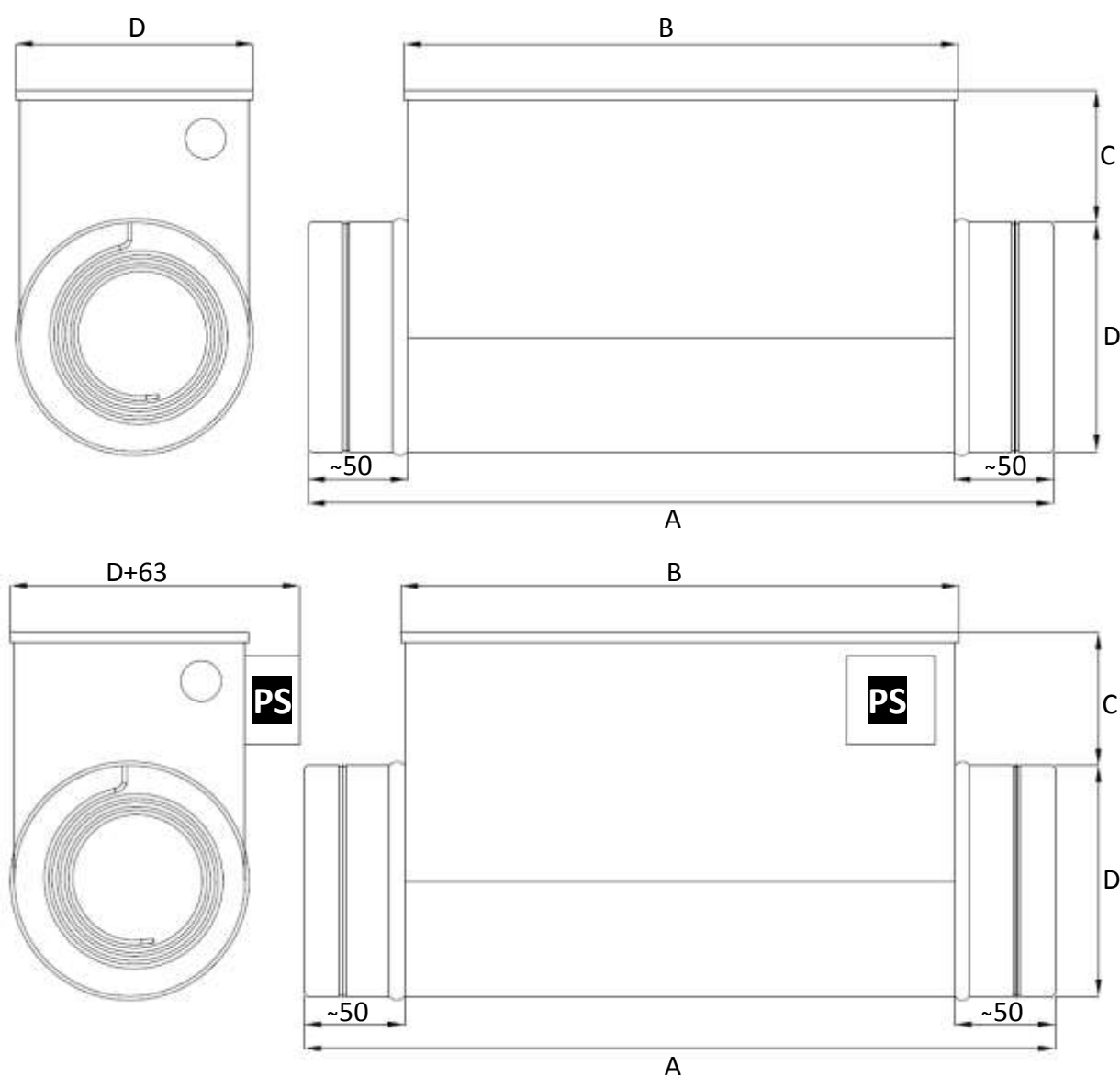
Technical data
Mounting
Maintenance

Description

Electrical duct heaters EKA are designed to heat fresh air in ventilation systems. Casing (*EKA protection class IP 44, except EKA Type NV which protection class IP 30*) is made from Aluzinc coated steel which is high temperature proof and with rubber seals for duct connection. Heating elements tube is made from stainless steel AISI 304. There are 2 protection thermostats and screw terminals for easy connection installed in the heaters.

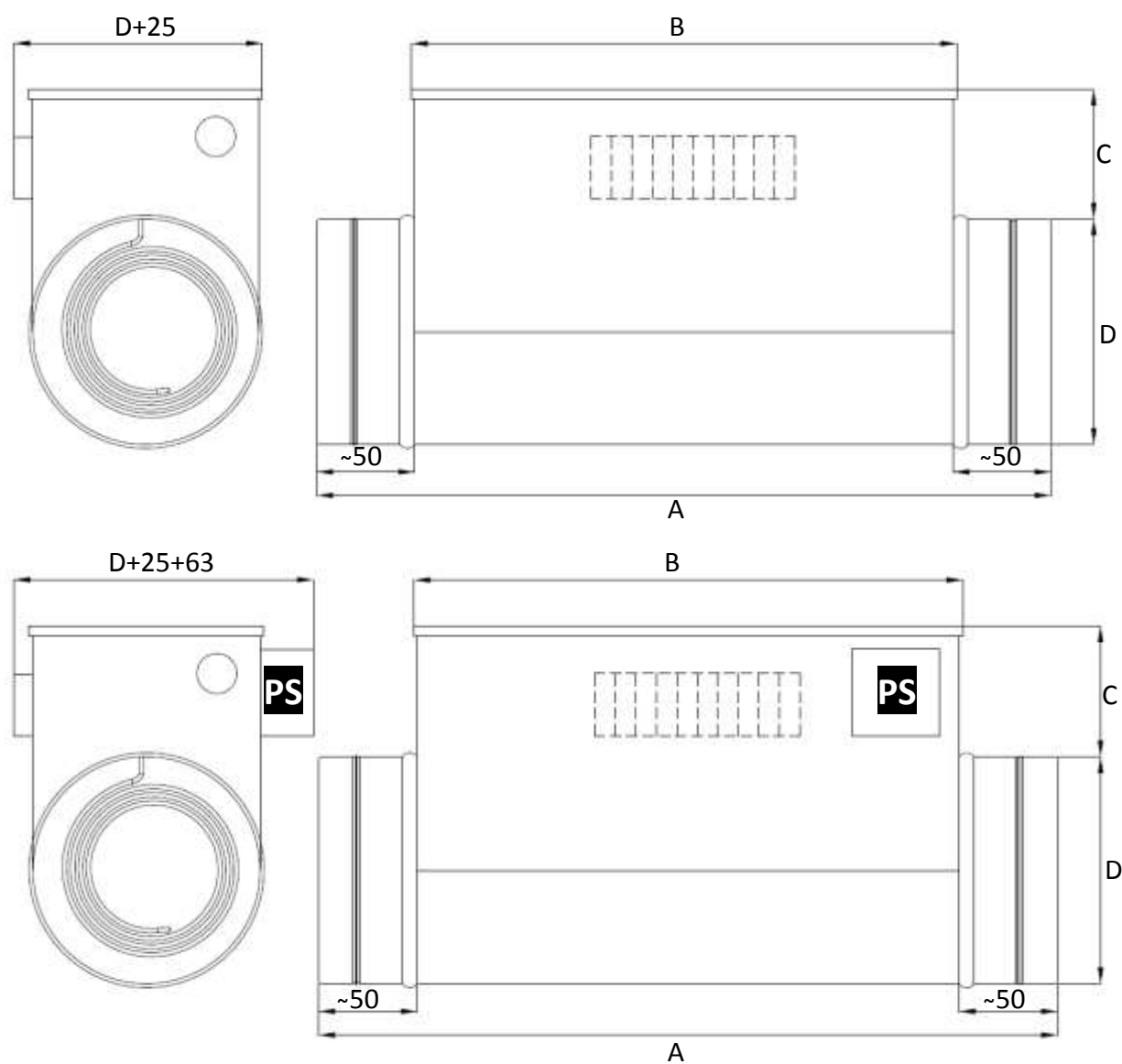
Heaters can be installed horizontally with the electrical connection box facing upwards or sideways and vertically (*only if the air flow direction upwards*). The air velocity in the duct of the heater must be 1,5 m/s minimum. The maximum temperature of the output is 50 °C.

Dimensions



$\leq 1,5$ kW (1~230V)

$< 3,0$ kW (2~400V); $\leq 3,0$ kW (3~400V)



>1,5 kW (1~230V)

≥3,0 kW (2~400V); >3,0 kW (3~400V)

<i>Heater type</i>	<i>A(mm)</i>	<i>B(mm)</i>	<i>C(mm)</i>	<i>D(mm)</i>
EKA 100	370	276	71	100
EKA 125	370	276	71	125
EKA 160	370	276	71	160
EKA 200	370	276	71	200
EKA 250	370	276	71	250
EKA 250-12kW	500	402	71	250
EKA 250-15kW	630	532	71	250
EKA 315	373	276	71	315
EKA 315-12kW	500	402	71	315
EKA 315-15kW	630	532	71	315
EKA 315-18kW	630	532	71	315
EKA 355	373	276	71	355
EKA 355-12kW	500	402	71	355
EKA 355-15kW	630	532	71	355
EKA 355-18kW	630	532	71	355
EKA 400	373	276	81	400
EKA 400-12kW	500	402	81	400
EKA 400-15kW	630	532	81	400
EKA 400-18kW	630	532	81	400
EKA 400-21kW	770	672	81	400
EKA 400-24kW	880	782	81	400
EKA 450	373	276	81	450
EKA 450-12kW	500	402	81	450
EKA 450-15kW	630	532	81	450
EKA 450-18kW	630	532	81	450
EKA 450-21kW	770	672	81	450
EKA 450-24kW	880	782	81	450
EKA 500	373	276	81	500
EKA 500-12kW	500	402	81	500
EKA 500-15kW	630	532	81	500
EKA 500-18kW	630	532	81	500
EKA 500-21kW	770	672	81	500
EKA 500-24kW	880	782	81	500

Technical data

Heater type	Diameter (mm)	Min. airflow (m³/h)	Power supply (VAC/50Hz)	Power (kW)	Available heating elements (kW)
EKA 100	100	45	1~230	0,3...1,8	0,3
EKA 125	125	70	1~230	0,3...3,6	0,3/0,6
EKA 160	160	110	1~230	0,3...7,2	0,3/0,6/1,0/1,2
			2~400	1,0...6,0	1,0
			3~400	3,0...6,0	1,0
EKA 200	200	170	1~230	0,3...7,2	0,3/0,6/1,0/1,2
			2~400	1,0...6,0	1,0
			3~400	3,0...9,0	1,0/1,5
EKA 250	250	265	1~230	0,3...7,2	0,3/0,6/1,0/1,2
			2~400	1,0...9,0	1,0/1,5
			3~400	3,0...9,0	1,0/1,5
EKA 250-12kW	250	265	3~400	12,0	1,0/1,5
EKA 250-15kW	250	265	3~400	15,0	1,0/1,5
EKA 315	315	425	1~230	0,6...9,0	0,6/1,0/1,2
			2~400	1,0...9,0	1,0/1,5
			3~400	3,0...9,0	1,0/1,5
EKA 315-12kW	315	425	2~400	12	1,0/1,5
			3~400	12	1,0/1,5
EKA 315-15kW	315	425	2~400	15	1,0/1,5
			3~400	15	1,0/1,5
EKA 315-18kW	315	425	2~400	18	1,0/1,5
			3~400	18	1,0/1,5
EKA 355	355	535	1~230	0,6...9,0	0,6/1,0/1,2
			2~400	1,0...9,0	1,0/1,5
			3~400	3,0...9,0	1,0/1,5
EKA 355-12kW	355	535	2~400	12	1,0/1,5
			3~400	12	1,0/1,5
EKA 355-15kW	355	535	2~400	15	1,0/1,5
			3~400	15	1,0/1,5
EKA 355-18kW	355	535	2~400	18	1,0/1,5
			3~400	18	1,0/1,5
EKA 400	400	680	1~230	0,6...9,0	0,6/1,0/1,2
			2~400	1,0...9,0	1,0/1,5
			3~400	3,0...9,0	1,0/1,5
EKA 400-12kW	400	680	1~230	9	1,0
			2~400	12	1,0/1,5
			3~400	12	1,0/1,5
EKA 400-15kW	400	680	1~230	12	1,0
			2~400	15	1,0/1,5
			3~400	15	1,0/1,5

EKA 400-18kW	400	680	2~400	18	1,0/1,5
			3~400	18	1,0/1,5
EKA 400-21kW	400	680	3~400	21	1,0/1,5
EKA 400-24kW	400	680	3~400	24	1,0/1,5
EKA 450	450	860	1~230	0,6...9,0	0,6/1,0/1,2
			2~400	1,0...9,0	1,0/1,5
			3~400	3,0...9,0	1,0/1,5
EKA 450-12kW	450	860	1~230	9	1,0
			2~400	12	1,0/1,5
			3~400	12	1,0/1,5
EKA 450-15kW	450	860	1~230	12	1,0
			2~400	15	1,0/1,5
			3~400	15	1,0/1,5
EKA 450-18kW	450	860	2~400	18	1,0/1,5
			3~400	18	1,0/1,5
EKA 450-21kW	450	860	3~400	21	1,0/1,5
EKA 450-24kW	450	860	3~400	24	1,0/1,5
EKA 500	500	1060	1~230	0,6...9,0	0,6/1,0/1,2
			2~400	1,0...9,0	1,0/1,5
			3~400	3,0...9,0	1,0/1,5
EKA 500-12kW	500	1060	1~230	9	1,0
			2~400	12	1,0/1,5
			3~400	12	1,0/1,5
EKA 500-15kW	500	1060	1~230	12	1,0
			2~400	15	1,0/1,5
			3~400	15	1,0/1,5
EKA 500-18kW	500	1060	2~400	18	1,0/1,5
			3~400	18	1,0/1,5
EKA 500-21kW	500	1060	3~400	21	1,0/1,5
EKA 500-24kW	500	1060	3~400	24	1,0/1,5

Heaters conforms to requirements of standards:

LST EN 60335-2-30:2003+A1:2005+A2:2007

LST EN 60335-2-30:2010+AC:2010+A11:2012 (EN 60335-2-30:2009+AC:2010+A11:2012)

and therefore complies with the essential requirements and provisions of the 2006/95/EC and 2004/108/EC Directives.

The CE mark is affixed.

Model marking

EKA 100-0.3-1f PS without integrated control

1 2 3 4

1 – Duct diameter (mm)

100 – 100 mm	200 – 200 mm	355 – 355 mm	500 – 500 mm
125 – 125 mm	250 – 250 mm	400 – 400 mm	
160 – 160 mm	315 – 315 mm	450 – 450 mm	

2 – Heating power (kW)

0.3 – 0,3 kW ... **24.0** – 24,0 kW

3 – Input voltage:

1f – Single phase 230V

2f – 2-phase 400V

3f – 3-phase 400V

3f – 3-phase 230V (*on request*)

4 – Additional accessories:

PS – Differential pressure switch for air flow detection

EKA NV 100-0.3-1f PTC/2NTC with integrated controller

1 2 3 4 5

1 – Control type:

NV – Potentiometer on the top of the heater casing for temperature control

NI – External wired remote setpoint knob (*TR5K*) for temperature control

NIS – External wired remote (*0...10*) VDC signal for temperature control (*analog input*)

ESKM – External wired remote PWM (*ON/OFF: ON (6...24) VDC*) signal for temperature control

MB – External wired remote temperature control via Modbus RTU protocol (*RS485*)

2 – Duct diameter (mm)

100 – 100 mm	200 – 200 mm	355 – 355 mm	500 – 500 mm
125 – 125 mm	250 – 250 mm	400 – 400 mm	
160 – 160 mm	315 – 315 mm	450 – 450 mm	

3 – Heating power (kW)

0.3 – 0,3 kW ... **24.0** – 24,0 kW (*NV, NI, NIS, MB*)

0.3 – 0,3 kW ... **15.0** – 15,0 kW (*ESKM*)

4 – Input voltage:

1f – Single phase 230V

2f – 2-phase 400V

3f – 3-phase 400V

3f – 3-phase 230V (*on request*)

5 – Additional accessories:

PS – Differential pressure switch for air flow detection

PTC – Sensor for minimum air velocity detection

PTC/PS – Sensor for minimum air velocity detection and diff. pressure switch for air flow detection

PTC/K – Sensor for minimum air velocity detection and contactor for overheating protection

PH – Sensor for minimum air velocity detection and diff. pressure switch for air flow detection

2NTC – 2 sensors for the air temperature measuring

PTC/2NTC – Sensor for min. air velocity detection and 2 sensors for the air temperature measuring

Overheating protection

In the electrical duct heaters EKA are installed two thermostats for overheating protection. The first one with automatic reset, turns off the heating when the temperature reaches 50 °C and turns on when the temperature drops below 50 °C. The second with manual reset, turns off the heating when the temperature reaches 100 °C. Only way to reset it, push the reset button on the top of the casing (*see mounting examples*) when the temperature drops below 100 °C.

In the heaters EKA ESKM are installed additional thermostat (*with automatic reset*) for controller ESKM overheating protection. This thermostat turns off the heating when the temperature reaches 70 °C and turns on when the temperature drops below 70 °C.

Installation and electrical connection

Electrical duct heaters EKA can be installed horizontally in any position except electrical connection box downward and vertically (*only if the air flow direction upwards*) (*see Fig. 1*).

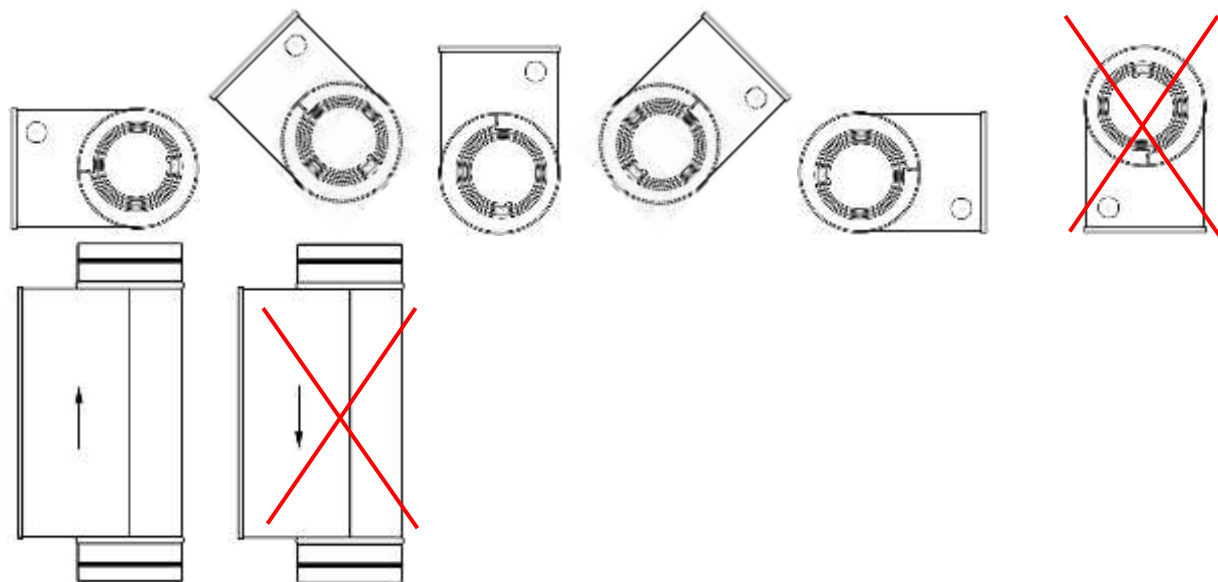


Fig. 1. Heaters installation positions

Heaters can't be installed in explosive and aggressive substances environment. Heaters can be used only for the clean air heating or preheating. Heaters intended only for inside installation. If heater is installed in such way that can be accidental contact with heating elements, protective grill must be installed. The air velocity in the duct of the heater must be 1,5 m/s minimum.

IMPORTANT:

The installation to the mains power supply may only be wired by a competent electrician. The power supply cable must be selected in the ratio with power of the heater. When installing these heaters, the standards and regulations in force in your country must be followed strictly adhered to. Within the installation an electrical isolation automatic circuit breaker (not included) must be present, to enable the installer to cut all power supply lines. Automatic circuit breaker must be selected regarding power and nominal current (see the electrical rating plate on the heater casing top) of the heater and should have characteristic B. Connect the heater to the mains power supply, check that the voltage, frequency, power and current are the same as those indicated on the electrical rating plate. The heater must be earthed.

We recommend install supply air temperature sensor in distance multiplied by the heater's diameter ($3 \times D$). For example: heater EKA diameter 200 mm, sensor's installation distance will be: $3 \times 200 = 600$ mm.

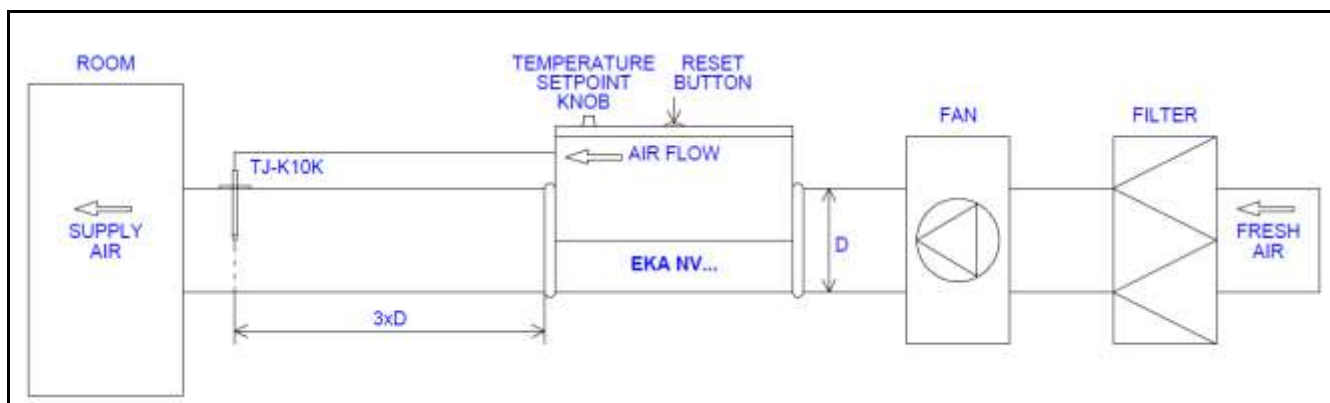


Fig. 2. Mounting example EKA NV...

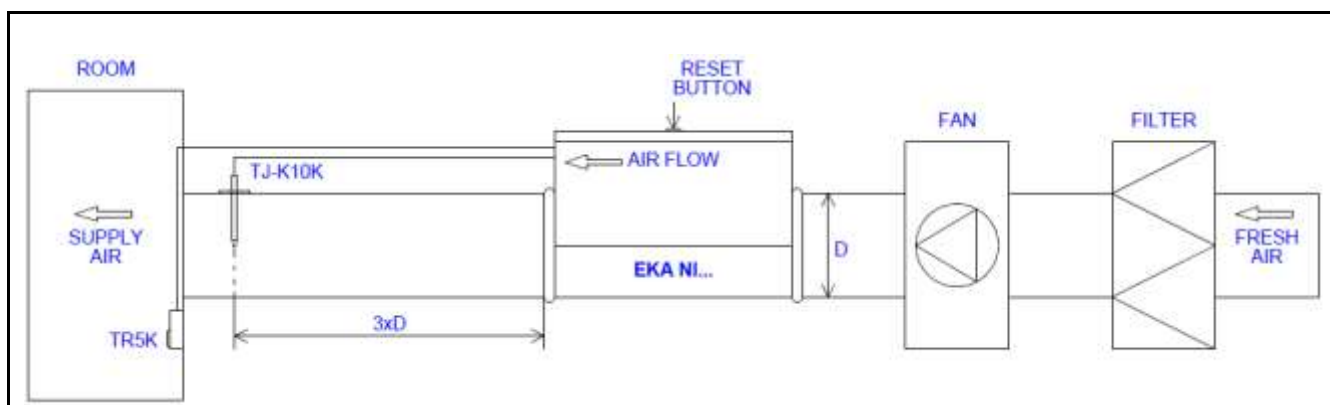


Fig. 3. Mounting example EKA NI...

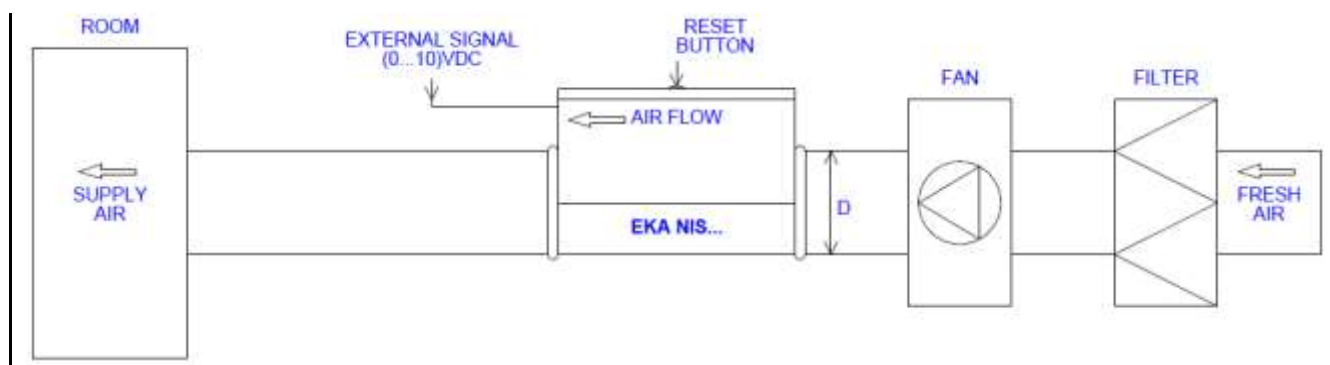


Fig. 3. Mounting example EKA NIS...

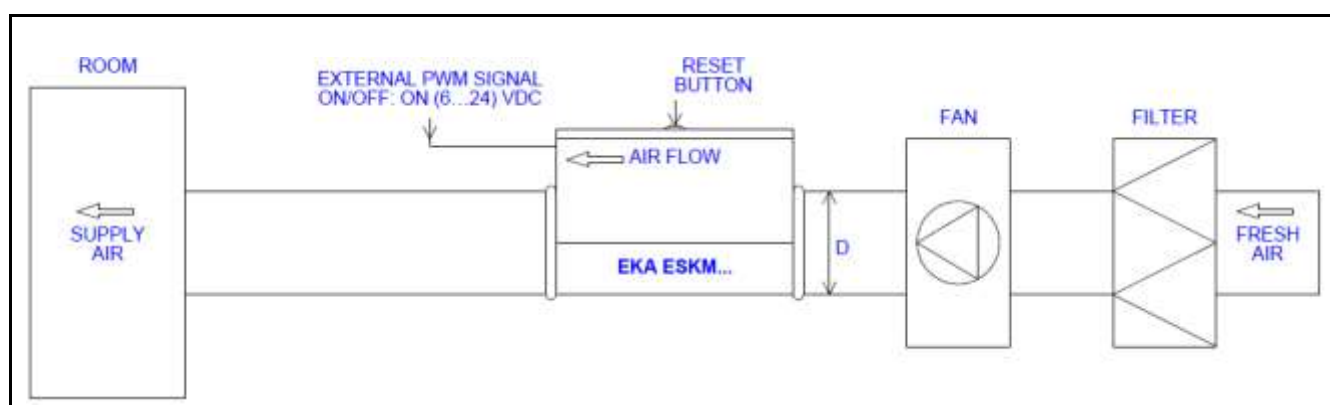


Fig. 4. Mounting example EKA ESKM...

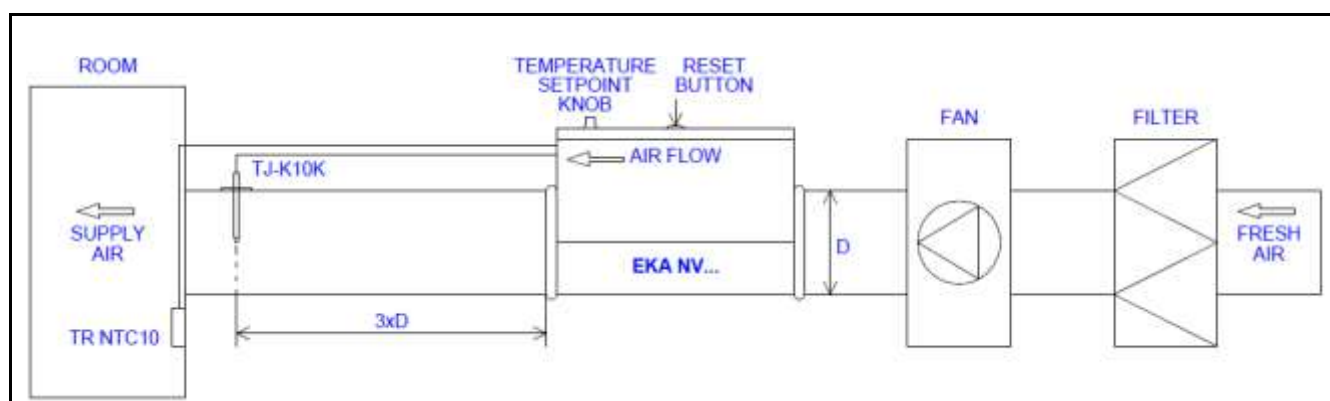


Fig. 5. Mounting example EKA NV...2NTC...

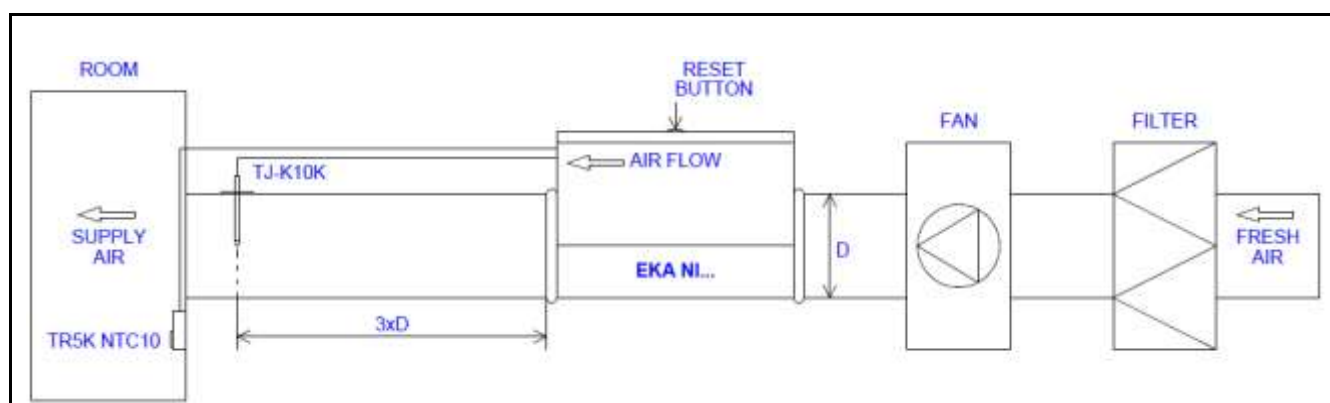


Fig. 6. Mounting example EKA NI...2NTC...

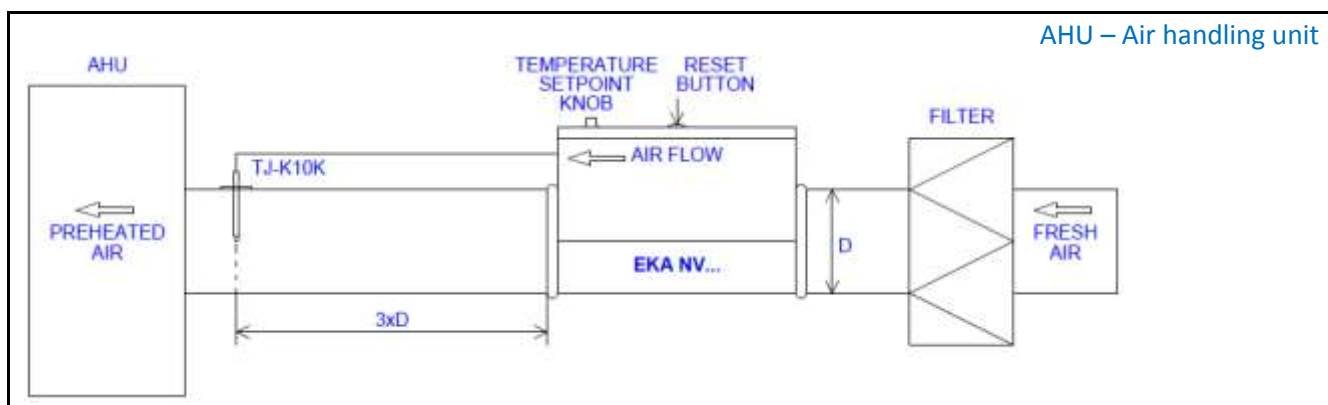


Fig. 7. Mounting example EKA NV... (Preheater)

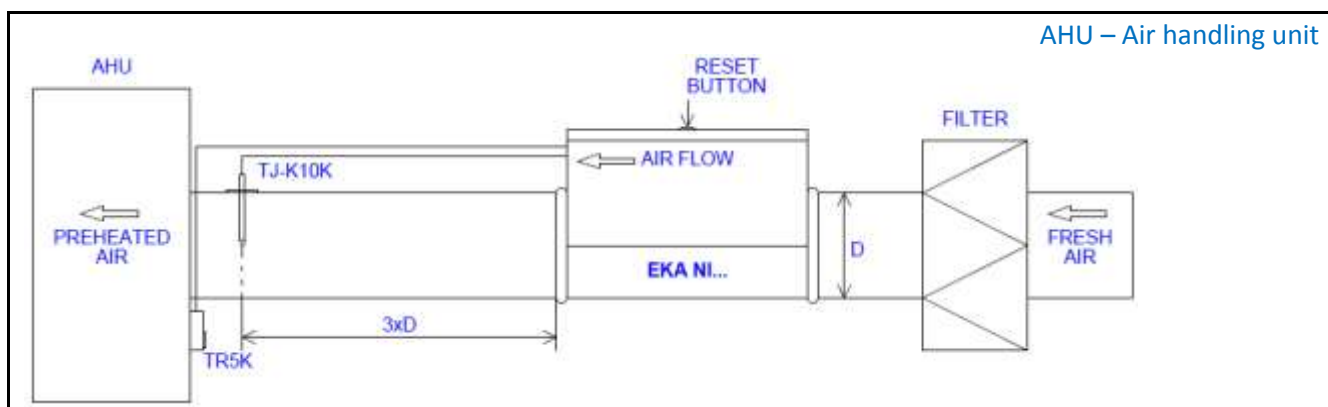


Fig. 8. Mounting example EKA NI... (Preheater)

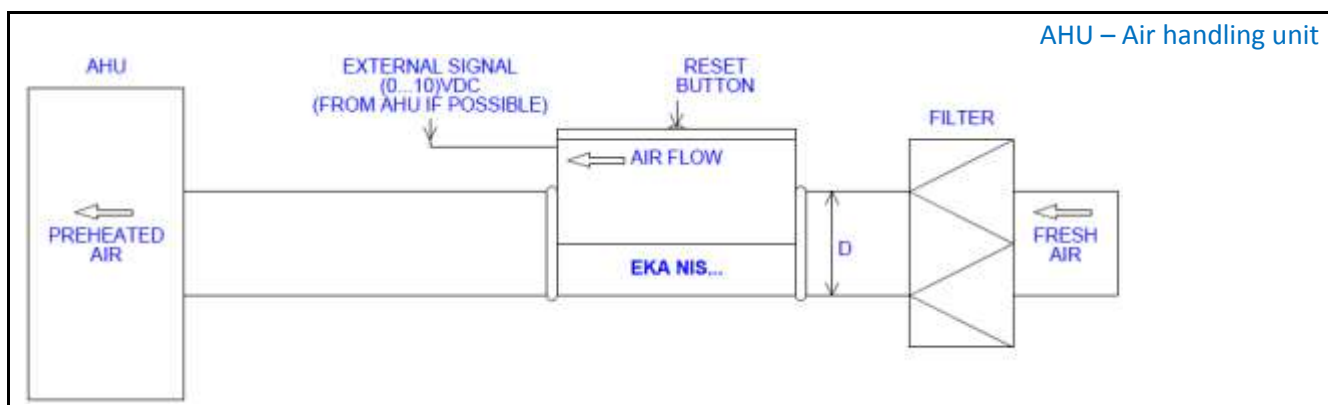


Fig. 9. Mounting example EKA NIS... (Preheater)

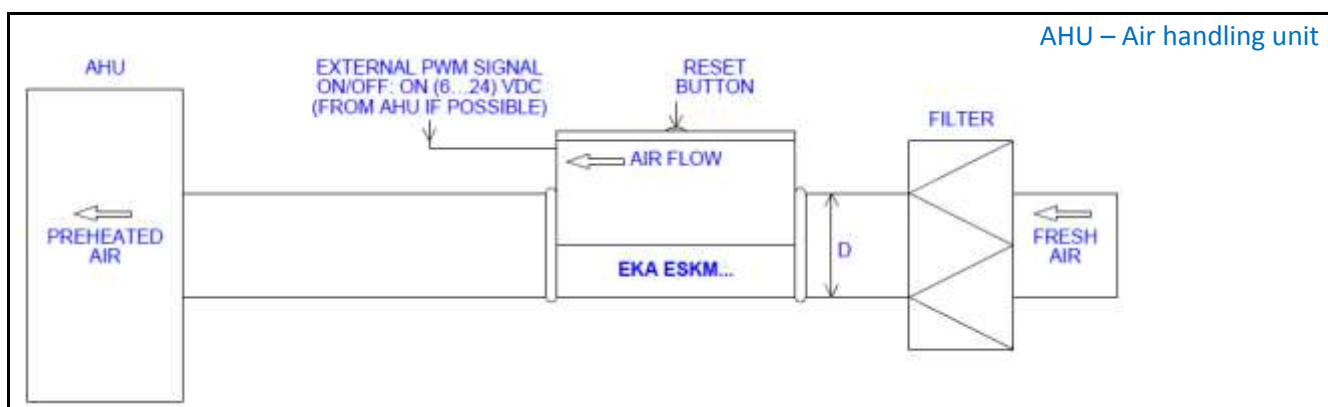


Fig. 10. Mounting example EKA ESKM... (Preheater)

Heaters EKA with integrated controller

Heaters EKA with integrated temperature controller EKR-KN... (See Fig. 11) can be controlled in five different ways depending on control type:

Type **EKA NV** – potentiometer on the top of the heater casing for temperature control

Type **EKA NI** – external wired remote setpoint knob (TR5K) for temperature control

Type **EKA NIS** – external wired remote 0...10V signal for temperature control

Type **EKA ESKM** – external wired remote PWM (ON/OFF: ON(6...24)VDC) signal for temp. control

Type **EKA MB** – external wired remote temperature control via Modbus RTU protocol (RS485)

Electrical duct heaters EKA with integrated temperature controller EKR-KN... works by PID regulator. That enable fine temperature control. Controller EKR-KN... controls load by Triacs without moving parts, which causes no-noise commutation.

Table 1. Technical characteristics of controller EKR-KN...

Power supply depending on model	single phase 230V / 2 - phase 400V / 3 - phase 400V
Power consumption in standby mode	0,1VA
Ambient temperature	0...50 °C
Relative humidity	Max. 90 % RH (non-condensing)

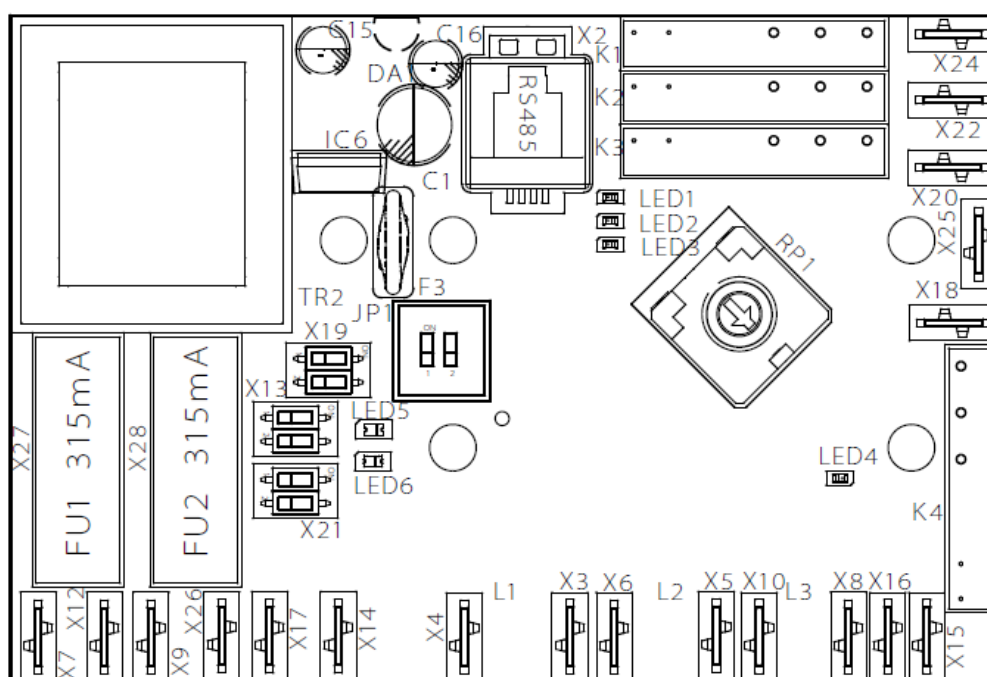


Fig. 11. Print circuit board (PCB) of temperature controller EKR-KN...
(View may vary depending on type EKR-KN)

External controllers for the heaters EKA





Heaters EKA without integrated control can be controlled with external controllers (*listed below*) with one or two air temperature sensors (*ordered separately*), depending on operating mode.

Type	Voltage Input/Output	Controlled Max. load (kW)	Additional Steps*/Max. load (kW)	Total load (kW)	Controlled Max. current (A)
 EKR 6.1	1~230/1~230	3,2	-	3,2	16
	2~400/2~400	6,4	-	6,4	
 EKR 15.1	3~230/3~230	9	1/9	18	25
	3~400/3~400	15	1/15	30	
 EKR 15.1P	3~230/3~230	9	4/135	144	25
	3~400/3~400	15	4/225	240	
 EKR 30.1	3~230/3~230	15	1/15	30	45
	3~400/3~400	30	1/30	60	
 EKR 30.1P	3~230/3~230	15	4/225	240	45
	3~400/3~400	30	4/450	480	

* – relay outputs (5A/230V) intended for contactors control. For more information read controllers user guide.

Additional accessories for the controllers

Additional accessories (*ordered separately*) intended for use with external and integrated controllers are listed below:

Type	Description	Measurement range (°C)	Setpoint range (°C)
 TJ-K10K	Duct temperature sensor	-30...105	-
 TR NTC10	Room temperature sensor panel	-30...105	-
 TR5K NTC10	Room temperature sensor panel with setpoint knob	-30...105	0...30
 TR5K	External remote panel with setpoint knob	-	0...30

For more information read accessories user guide.

Description of control type

Heater type	Temperature control type	Setpoint range
EKA NV...	Potentiometer on the top of the heater casing	(0...30) °C*
EKA NI...	External wired remote panel with setpoint knob (TR5K)	(0...30) °C
EKA NIS...	External wired remote (0...10) VDC signal (analog input)	P**×(0...100) %
EKA ESKM...	External wired remote PWM (ON/OFF: ON (6...24) VDC) signal	P**×(0...100) %
EKA MB...	External wired remote control via Modbus RTU protocol (RS485)	(0...30) °C or P**×(0...100) %

* – other setpoint range on request

** – power of the heater (kW)

Description of operating EKA NV ...

Electrical duct heaters EKA NV ... are designed with integrated temperature control, one temperature sensor, potentiometer on the top of the heater casing for temperature setpoint.

When the heater power supply is switched on, LED 6 on the controller (EKR-KN...) PCB (see Fig. 11) flashes once every 8 seconds if setpoint is 0 °C and every second if setpoint is higher than 0 °C. If controller turns on the heating depending on the demand, LED 5 lights (see Fig. 11).

Heaters EKA NV ... operates by the supply (TJ-K10K) air temperature sensor. Setpoint temperature (0...30) °C.

There can be set the different desired (setpoint) air temperature by potentiometer on the top of the heater casing.

If LED 6 lights continuously it means that there is a failure of: supply (TJ-K10K) air temperature sensor or potentiometer on the top of the heater casing.

IMPORTANT: If failure appears, power supply must be switched off and only then performed fault elimination works.

Description of operating EKA NI ...

Electrical duct heaters EKA NI ... are designed with integrated temperature control, one temperature sensor, wired remote control panel (TR5K) for temperature setpoint.

When the heater power supply is switched on, LED 6 on the controller (EKR-KN...) PCB (see Fig. 11) flashes once every 8 seconds if setpoint is 0 °C and every second if setpoint is higher than 0 °C. If controller turns on the heating depending on the demand, LED 5 lights (see Fig. 11).

Heaters EKA NI ... operates by the supply (TJ-K10K) air temperature sensor. Setpoint temperature (0...30) °C.

There can be set the different desired (setpoint) air temperature by wired remote control panel.

If LED 6 lights continuously it means that there is a failure of: supply (TJ-K10K) air temperature sensor or wired remote control panel TR5K.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NIS ...

Electrical duct heaters EKA NIS ... are designed for the heaters power (0...100) % control by analog signal input (0...10) VDC.

When the heater power supply is switched on, LED 6 on the controller (EKR-KN...) PCB (see Fig. 11) flashes every second. If controller turns on the heating depending on analog signal, LED 5 lights (see Fig. 11).

Description of operating EKA NV ... PTC ... (PH)

Electrical duct heaters EKA NV ... PTC ... are designed with integrated temperature control, PTC (air velocity) and temperature sensors, potentiometer on the top of the heater casing for temperature setpoint.

When the heater power supply is switched on, controller (EKR-KN...) is in preparing mode for 30 seconds, LED 1 flashes once every 5 seconds. If there is air velocity (Min. 1,5 m/s) in the duct heater after preparing mode, LED 1 flashes once per second and controller turns on the heating depending on the demand, LED 2 lights. If there is no air velocity, controller don't turns on the heating till air velocity appears.

Heaters EKA NV ... PTC ... (PH) operates by the supply (TJ-K10K) air temperature sensor. Setpoint temperature (0...30) °C.

There can be set the different desired (setpoint) air temperature by potentiometer on the top of the heater casing.

If LED 1 lights continuously it means that there is a failure of: PTC (air velocity) sensor, supply (TJ-K10K) air temperature sensor, potentiometer on the top of the heater casing.

When the heater power supply is switched on, after power supply interruption or after any failure, controller is in preparing mode for 30 seconds.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NI ... PTC ... (PH)

Electrical duct heaters EKA NI ... PTC ... (PH) are designed with integrated temperature control, PTC (air velocity) and temperature sensors, wired remote control panel (TR5K) for temperature setpoint.

When the heater power supply is switched on, controller (EKR-KN...) is in preparing mode for 30 seconds, LED 1 flashes once every 5 seconds. If there is air velocity (Min. 1,5 m/s) in the duct heater after preparing mode, LED 1 flashes once per second and controller turns on the heating depending on the demand, LED 2 lights. If there is no air velocity, controller don't turns on the heating till air velocity appears.

Heaters EKA NI ... PTC ... (PH) operates by the supply (TJ-K10K) air temperature sensor. Setpoint temperature (0...30) °C.

There can be set the different desired (*setpoint*) air temperature by wired remote control panel.

If LED 1 lights continuously it means that there is a failure of: PTC (*air velocity*) sensor, supply (TJ-K10K) air temperature sensor, wired remote control panel TR5K.

When the heater power supply is switched on, after power supply interruption or after any failure, controller in preparing mode for 30 seconds.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NIS ... PTC ... (PH)

Electrical duct heaters EKA NIS ... PTC ... (PH) are designed for the heaters power (0...100) % control by analog signal input (0...10) VDC and with integrated PTC (air velocity) sensor.

When the heater power supply is switched on, controller (EKR-KN...) is in preparing mode for 30 seconds, LED 1 flashes once every 5 seconds. If there is air velocity (*Min. 1,5 m/s*) in the duct heater after preparing mode, LED 1 flashes once per second and controller turns on the heating depending on analog signal, LED 2 lights. If there is no air velocity, controller don't turns on the heating till air velocity appears.

If LED 1 lights continuously it means that there is a failure of PTC (*air velocity*) sensor.

When the heater power supply is switched on, after power supply interruption or after any failure, controller is in preparing mode for 30 seconds.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NV ... 2NTC

Electrical duct heaters EKA NV ... 2NTC are designed with integrated temperature control, two temperature sensors, potentiometer on the top of the heater casing for temperature setpoint.

When the heater power supply is switched on, LED 6 on the controller (EKR-KN...) PCB (*see Fig. 11*) flashes once every 8 seconds if setpoint is 0 °C and every second if setpoint is higher than 0 °C. If controller turns on the heating depending on the demand, LED 5 lights (*see Fig. 11*).

Heaters EKA NV ... 2NTC operates by the supply (TJ-K10K) and by the room (NTC10) air temperature sensor. Setpoint temperature (15...30) °C. In this mode is preprogrammed the minimum (15°C) and the maximum (45°C) temperatures of supply air. The room air temperature sensor is mounted in the wired panel TR NTC10.

There can be set the different desired (*setpoint*) air temperature by potentiometer on the top of the heater casing.

If LED 6 lights continuously it means that there is a failure of: supply (TJ-K10K) or room (NTC10) air temperature sensor, potentiometer on the top of the heater casing.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NI ... 2NTC

Electrical duct heaters EKA NI ... 2NTC are designed with integrated temperature control, two temperature sensors, wired remote control panel (TR5K NTC10) for temperature setpoint.

When the heater power supply is switched on, LED 6 on the controller (EKR-KN...) PCB (see Fig. 11) flashes once every 8 seconds if setpoint is 0 °C and every second if setpoint is higher than 0 °C. If controller turns on the heating depending on the demand, LED 5 lights (see Fig. 11).

Heaters EKA NI ... 2NTC operates by the supply (TJ-K10K) and by the room (NTC10) air temperature sensor. Setpoint temperature (15...30) °C. In this mode is preprogrammed the minimum (15°C) and the maximum (45°C) temperatures of supply air. The room air temperature sensor is mounted in the wired remote control panel TR5K NTC10.

There can be set the different desired (setpoint) air temperature by wired remote control panel TR5K NTC10.

If LED 6 lights continuously it means that there is a failure of: supply (TJ-K10K) or room (NTC10) air temperature sensor, wired remote control panel TR5K NTC10.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NV ... PTC/2NTC

Electrical duct heaters EKA NV ... PTC/2NTC are designed with integrated temperature control, PTC (air velocity) and two temperature sensors, potentiometer on the top of the heater casing for temperature setpoint.

When the heater power supply is switched on, controller (EKR-KN...) is in preparing mode for 30 seconds, LED 1 flashes once every 5 seconds. If there is air velocity (Min. 1,5 m/s) in the duct heater after preparing mode, controller turns on the heating depending on the demand, LED 2 lights. If there is no air velocity, controller don't turns on the heating till air velocity appears.

Heaters EKA NV ... PTC/2NTC can operate in two modes:

1. Control by the supply air temperature sensor (TJ-K10K), when the first (1) switch of JP1 (see Fig. 11) is in position OFF. LED 1 flashes once per second. Setpoint temperature (0...30) °C.
2. Control by the supply (TJ-K10K) and by the room (NTC10) air temperature sensor, when the first (1) switch of JP1 (see Fig. 11) is in position ON. LED 1 flashes twice per second. Setpoint temperature (15...30) °C. In this mode is preprogrammed the minimum (15°C) and the maximum (40°C) temperatures of supply air. The room air temperature sensor is mounted in the wired panel TR NTC10.

Depending on the operating mode there can be set the different desired (setpoint) air temperature by potentiometer on the top of the heater casing.

If LED 1 lights continuously it means that there is a failure of: PTC (*air velocity*) sensor, supply (TJ-K10K) or room (NTC10) air temperature sensor, potentiometer on the top of the heater casing.

When the heater power supply is switched on, after power supply interruption or after any failure, controller is in preparing mode for 30 seconds.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA NI ... PTC/2NTC

Electrical duct heaters EKA NI ... PTC/2NTC are designed with integrated temperature control, PTC (*air velocity*) and two temperature sensors, wired remote control panel (TR5K NTC10) for temperature setpoint.

When the heater power supply is switched on, controller (EKR-KN...) is in preparing mode for 30 seconds, LED 1 flashes once every 5 seconds. If there is air velocity (*Min. 1,5 m/s*) in the duct heater after preparing mode, controller turns on the heating depending on the demand, LED 2 lights. If there is no air velocity, controller don't turns on the heating till air velocity appears.

Heaters EKA NI ... PTC/2NTC can operate in two modes:

1. Control by the supply air temperature sensor (TJ-K10K), when the first (1) switch of JP1 (see Fig. 11) is in position OFF. LED 1 flashes once per second. Set point temperature (0...30) °C.
2. Control by the supply (TJ-K10K) and by the room (NTC10) air temperature sensor, when the first (1) switch of JP1 (see Fig. 11) is in position ON. LED 1 flashes twice per second. Setpoint temperature (15...30) °C. In this mode is preprogrammed the minimum (15°C) and the maximum (40°C) temperatures of supply air. The room air temperature sensor is mounted in the wired remote control panel TR5K NTC10.

Depending on the operating mode there can be set the different desired (*setpoint*) air temperature by wired remote control panel TR5K NTC10.

If LED 1 lights continuously it means that there is a failure of: PTC (*air velocity*) sensor, supply (TJ-K10K) or room (NTC10) air temperature sensor, wired remote control panel TR5K NTC10.

When the heater power supply is switched on, after power supply interruption or after any failure, controller is in preparing mode for 30 seconds.

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Description of operating EKA MB ...

Electrical duct heaters EKA MB ... can communicate via Modbus RTU. Connected to the system EKA MB ... is a Slave device. Modbus settings are shown in table 2.

Table 2. Modbus settings

Setting	Possible values	Default value
Device address	1...247	10
Baud rate	2400, 4800, 9600, 19200, 38400	9600
Parity	None, Even, Odd	None
Stop bit	None, 1, 2	1

There is connection provided on the PCB for Modbus (see Fig. 11). Connector pin layout and meanings are shown in Fig. 12.

Fig. 12. Connector for Modbus control



1. +12VDC
2. B-
3. A+
4. GND

For detailed information about control via Modbus please contact manufacturer.

Electrical wiring diagrams

S – Automatic circuit breaker

J – Switch

T – Timer

EKR-KN... – PCB of temperature controller

V1, V2 – Triacs

A – Heating elements

B – Overheat thermostat with automatic reset

C – Overheat thermostat with manual reset

K – Contactor (relay)

PTC – Sensor for minimum air velocity detection

PS – Differential pressure switch for air flow detection

TJ-K10K – Supply air temperature sensor

TR NTC10 – Room temperature sensor panel

TR5K NTC10 – Room temperature sensor panel with remote setpoint knob

TR5K – External remote setpoint knob panel

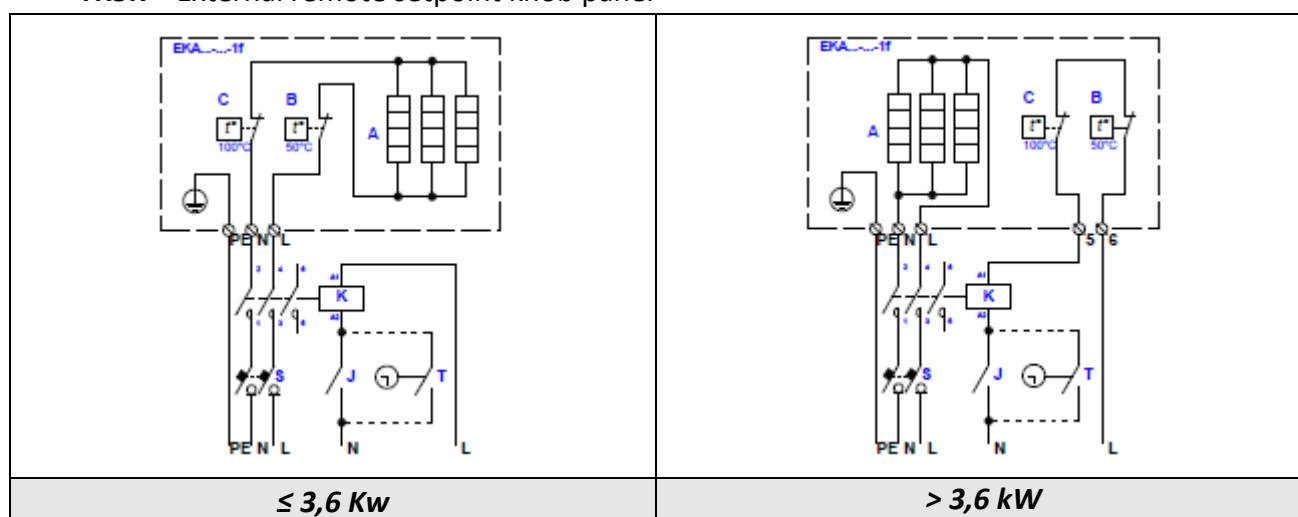


Fig. 13. Electrical wiring diagrams of single phase 230V heater EKA...-...-1f

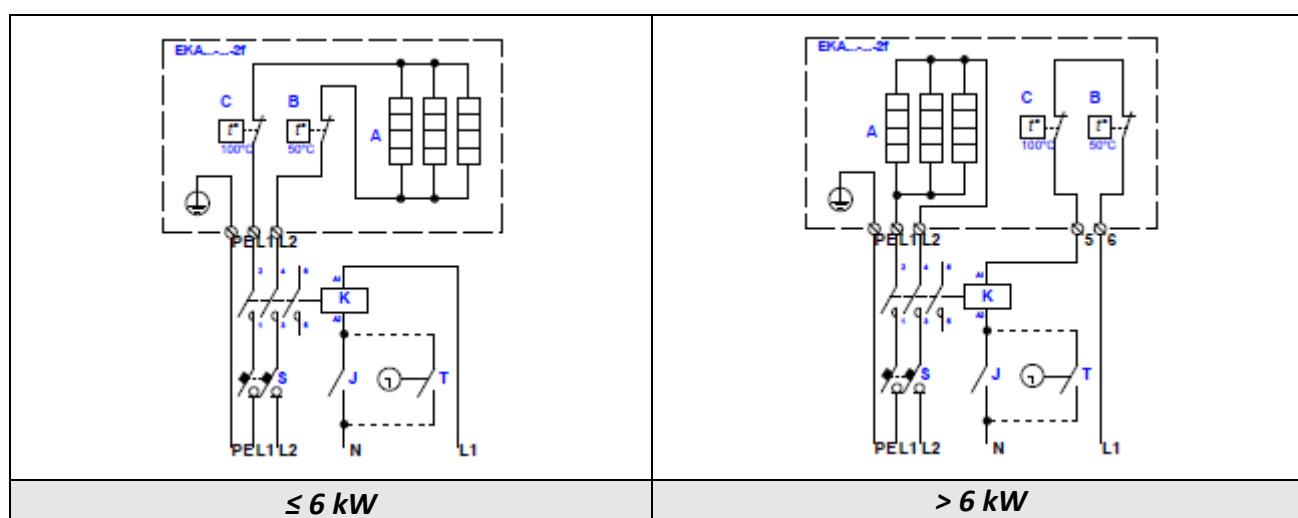


Fig. 14. Electrical wiring diagrams of 2-phase 400V heater EKA...-...-2f

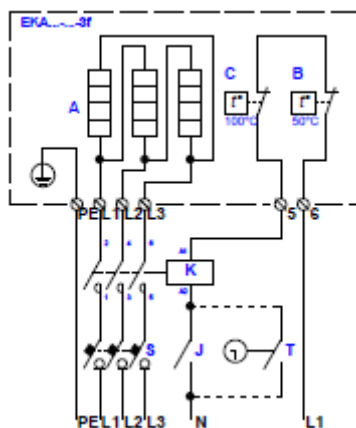
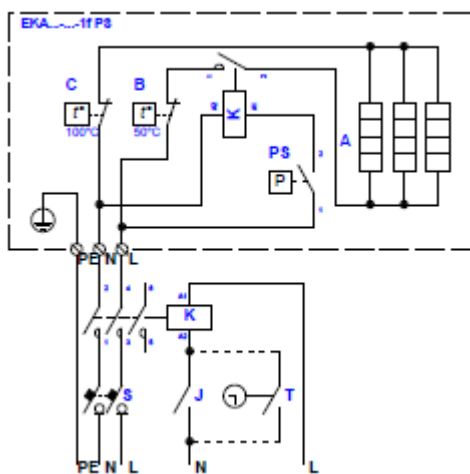
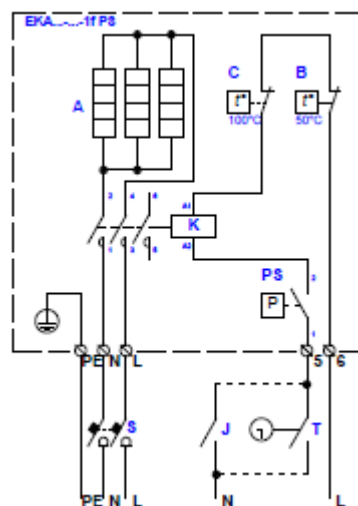


Fig. 15. Electrical wiring diagram of 3-phase 400V heater EKA...-3f

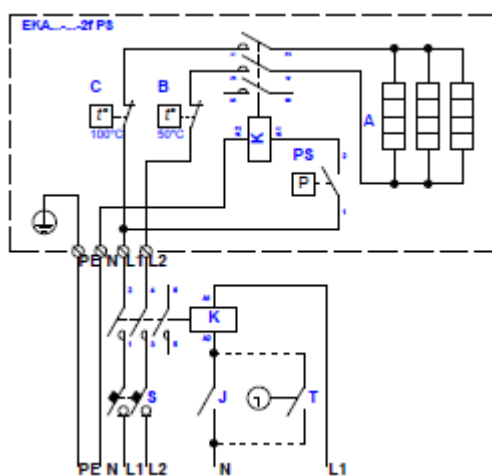


≤ 3,6 kW

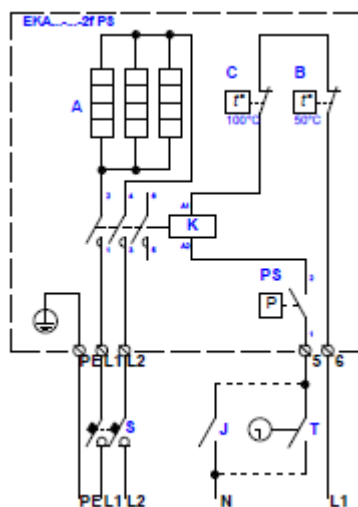


> 3,6 kW

Fig. 16. Electrical wiring diagrams of single phase 230V heater EKA...-1f PS



≤ 6 kW



> 6 kW

Fig. 17. Electrical wiring diagrams of 2-phase 400V heater EKA...-2f PS

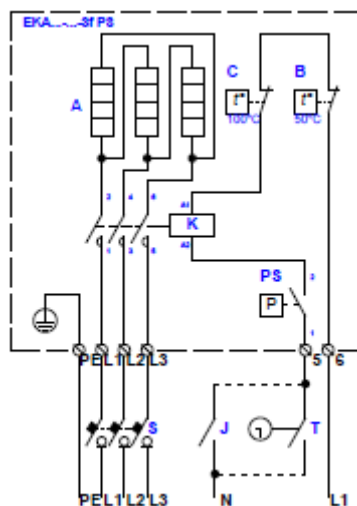


Fig. 18. Electrical wiring diagram of 3-phase 400V heater EKA...-3f PS

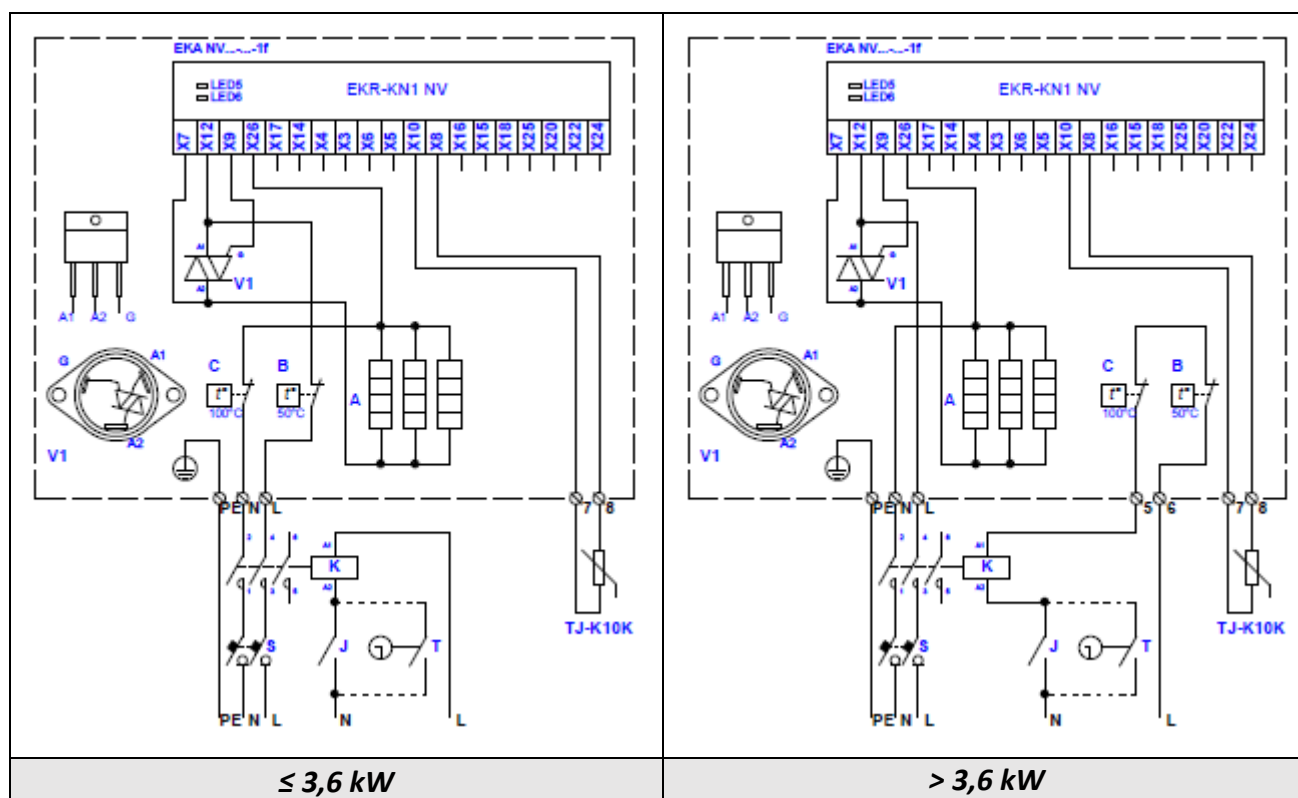


Fig. 19. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f

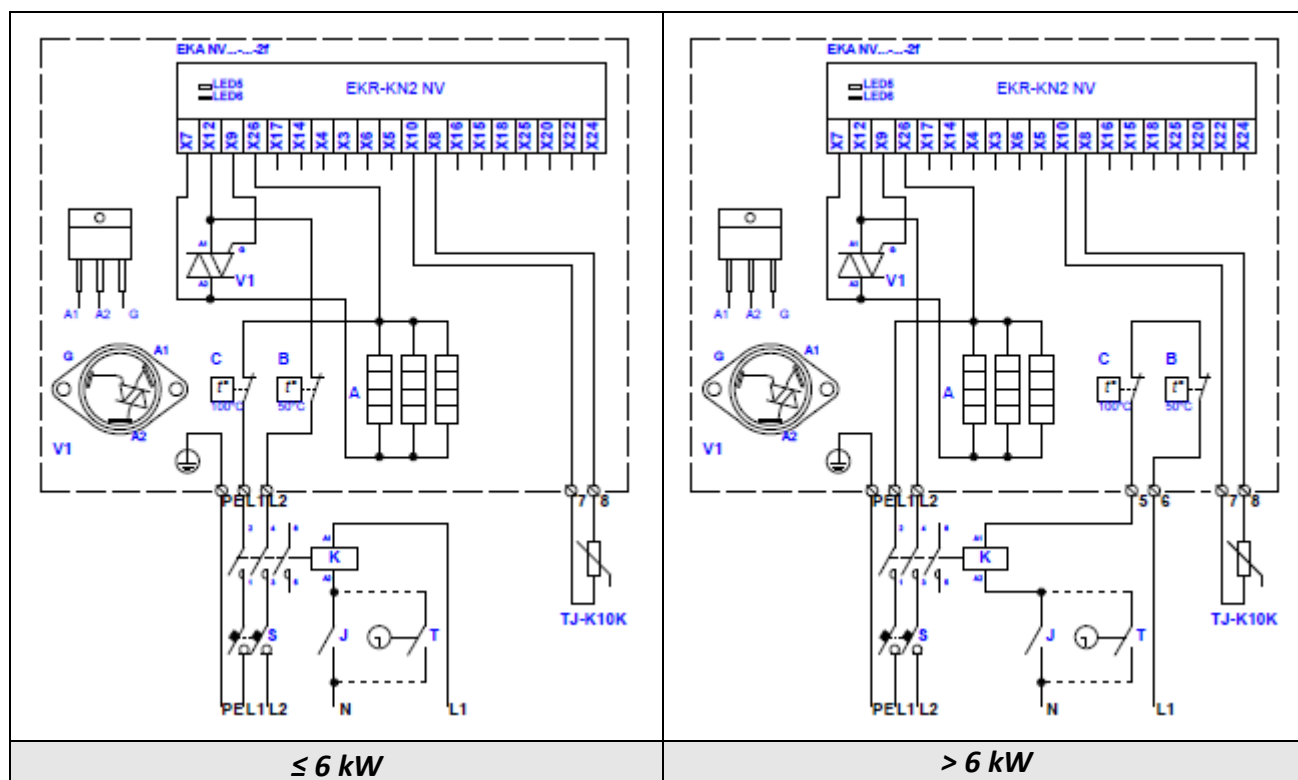


Fig. 20. Electrical wiring diagrams of 2-phase 400V heater EKA NV...-2f

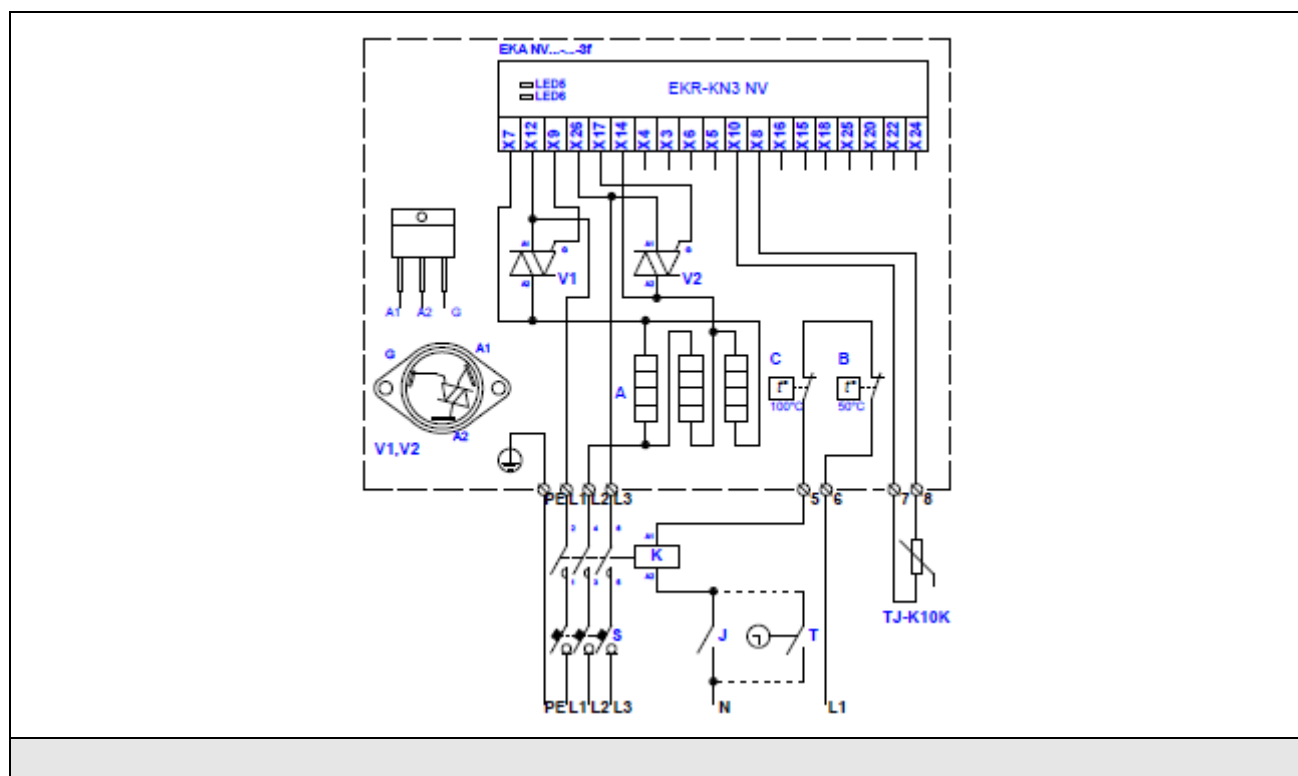


Fig. 21. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f

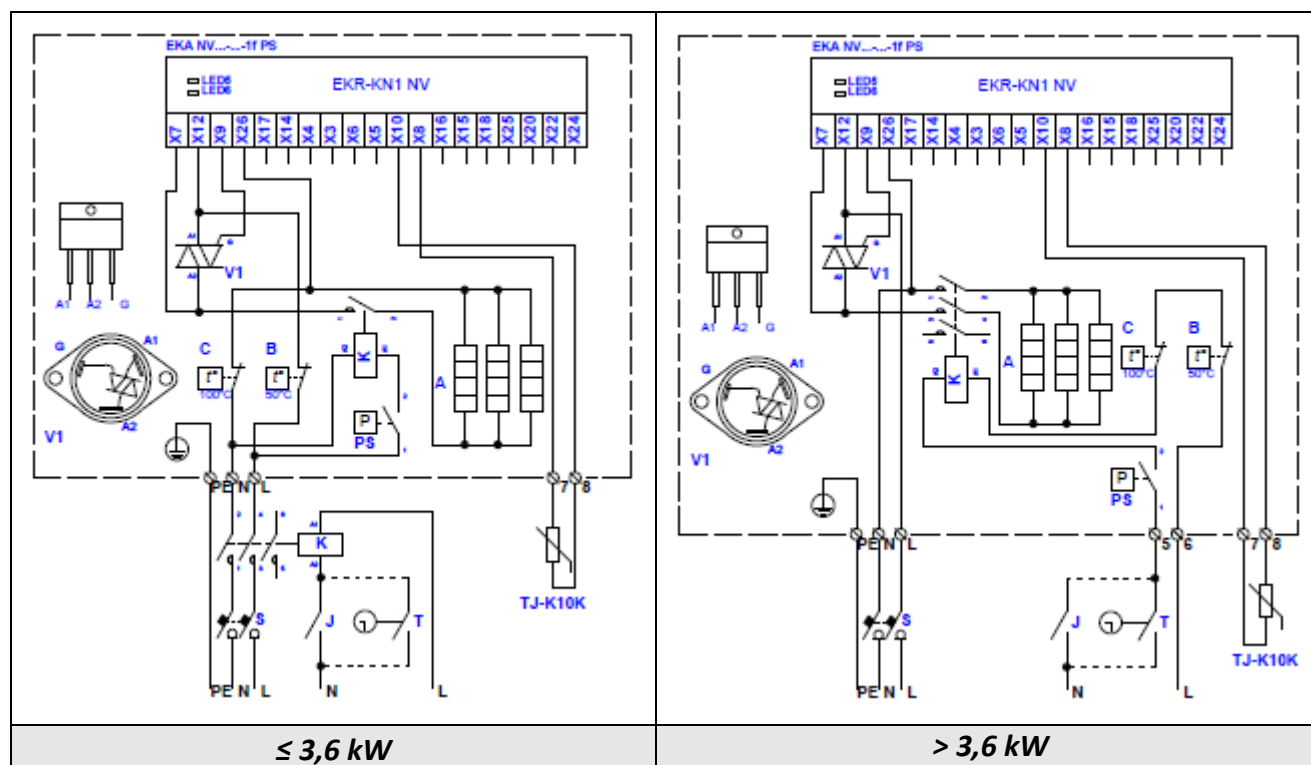


Fig. 22. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f PS

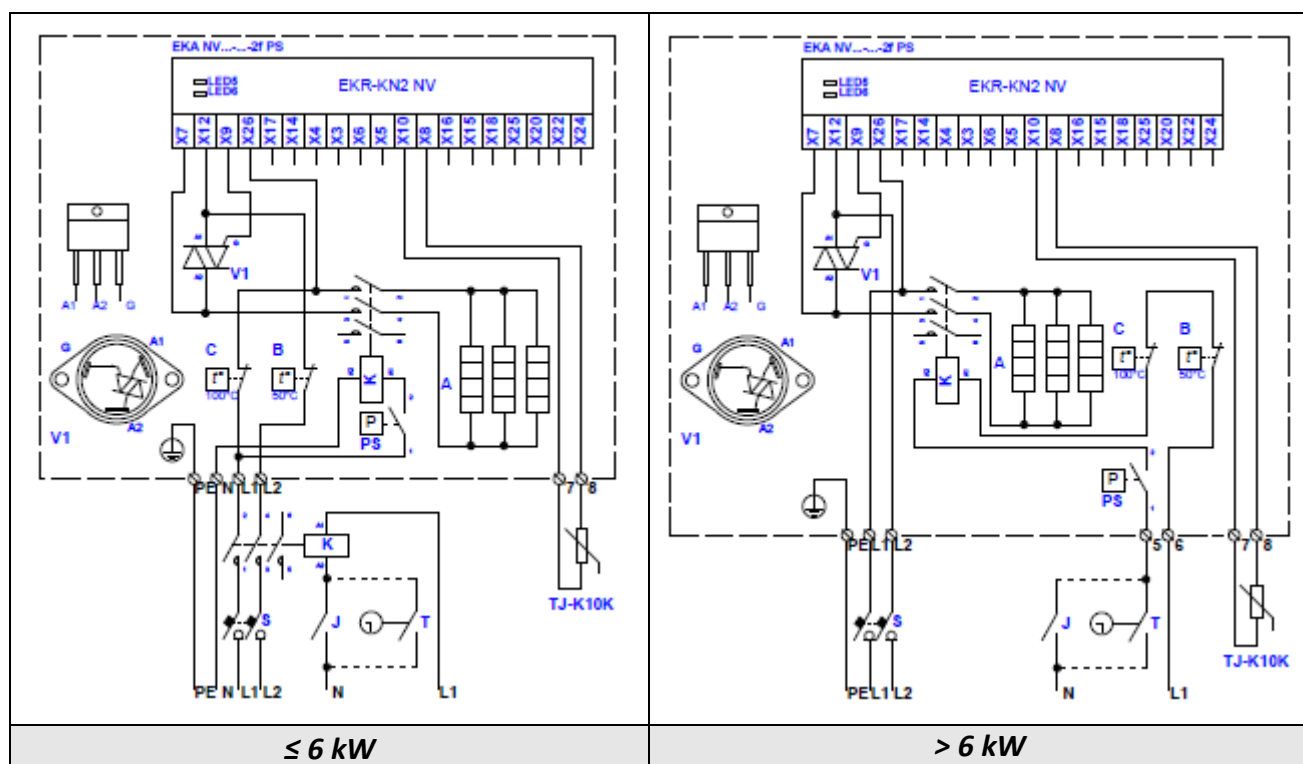


Fig. 23. Electrical wiring diagrams of 2-phase 400V heater EKA NV...-2f PS

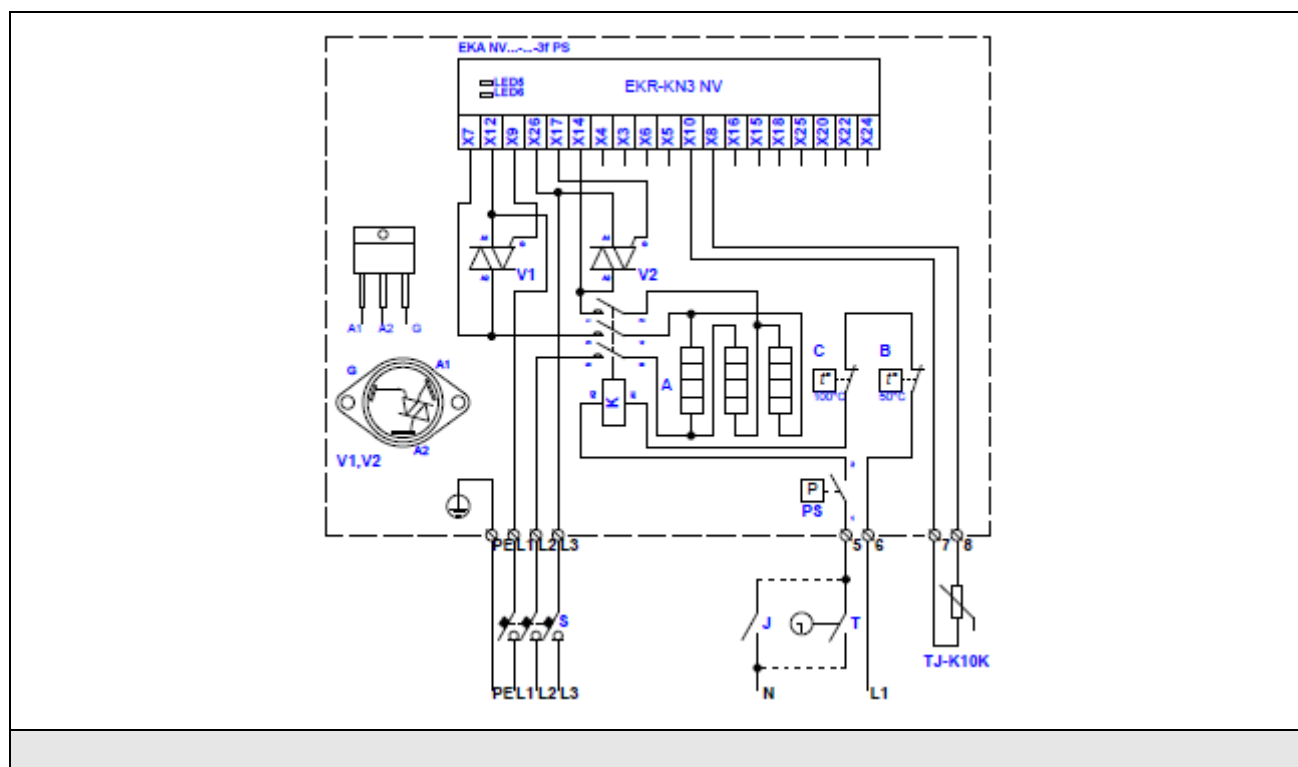


Fig. 24. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f PS

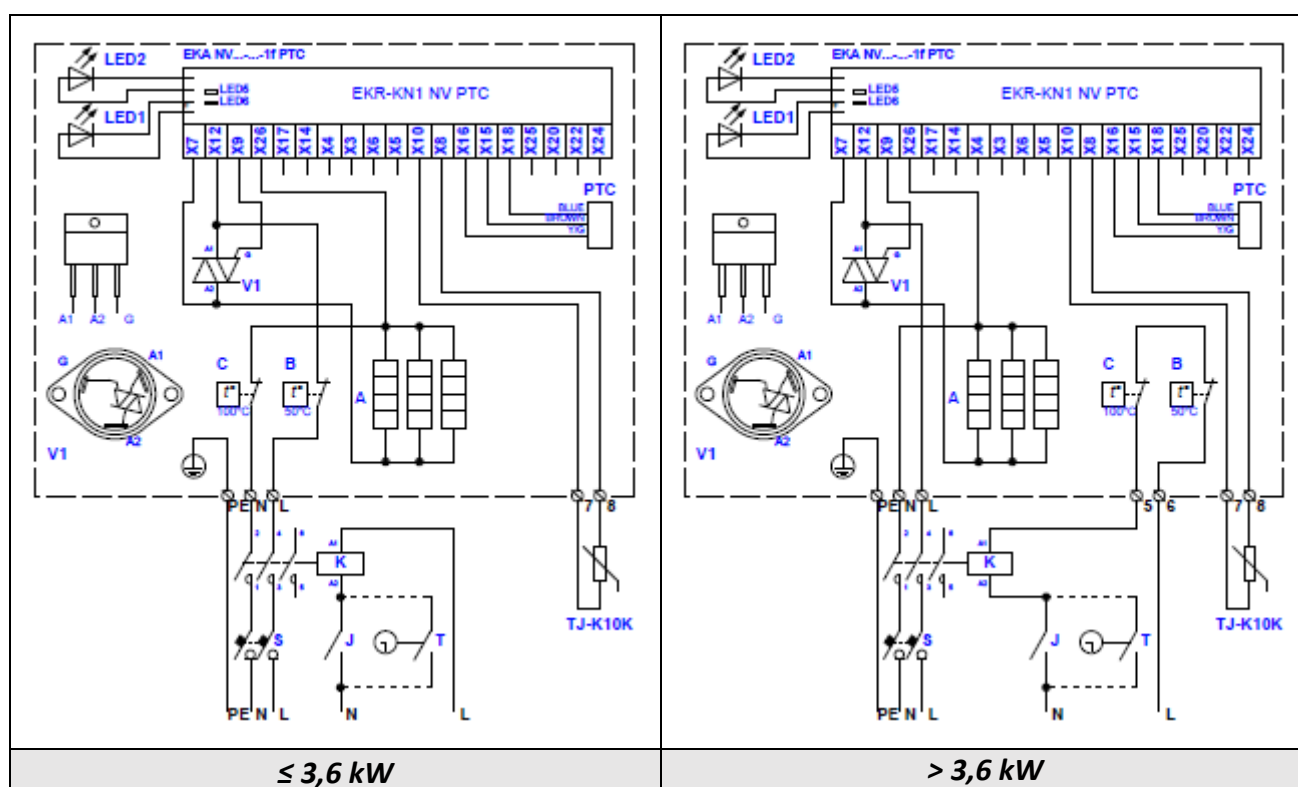


Fig. 25. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f PTC

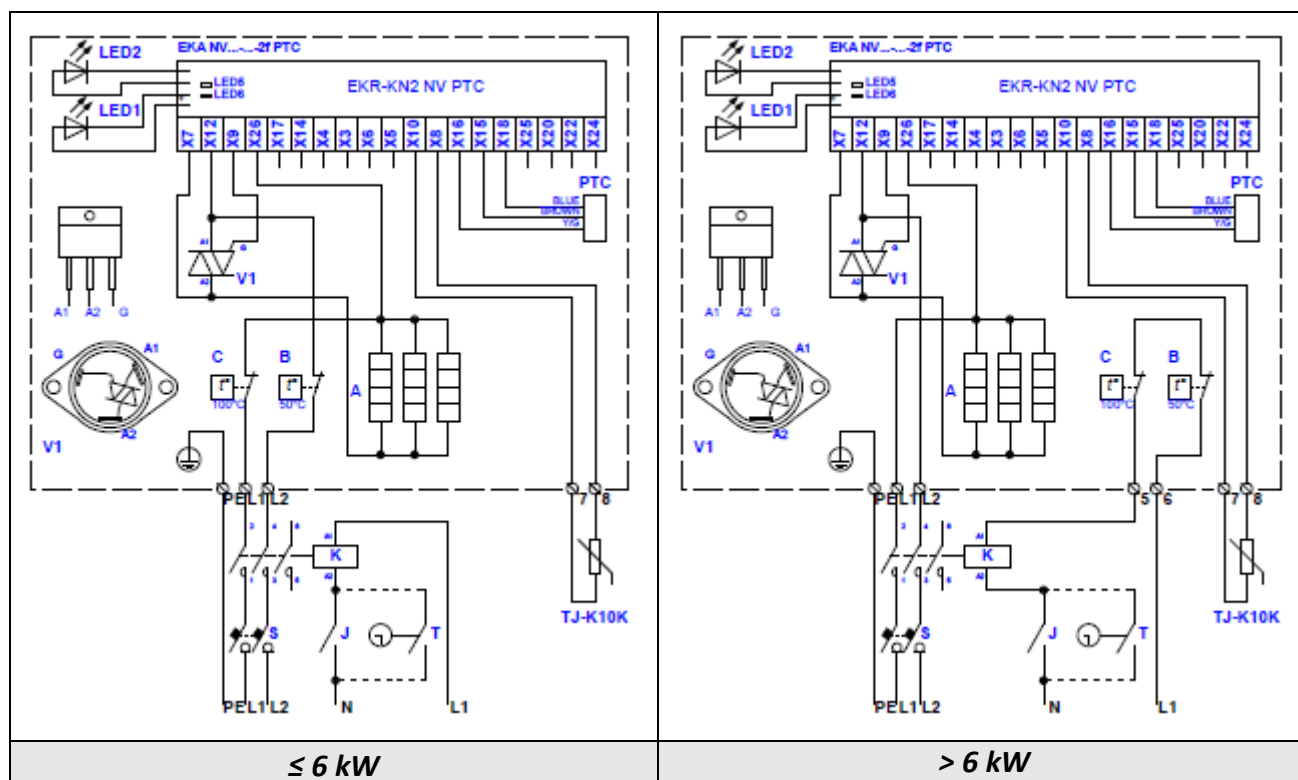


Fig. 26. Electrical wiring diagrams of 2-phase 400V heater EKA NV...-2f PTC

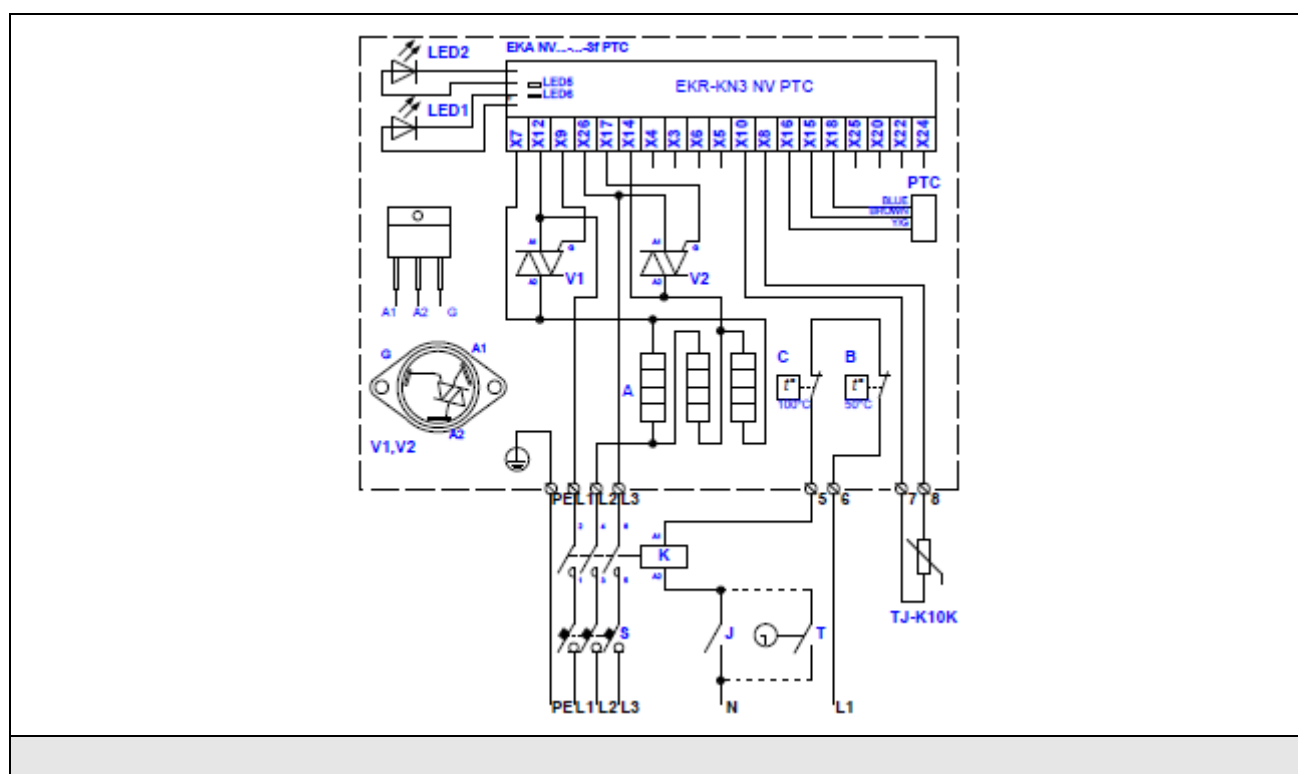


Fig. 27. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f PTC

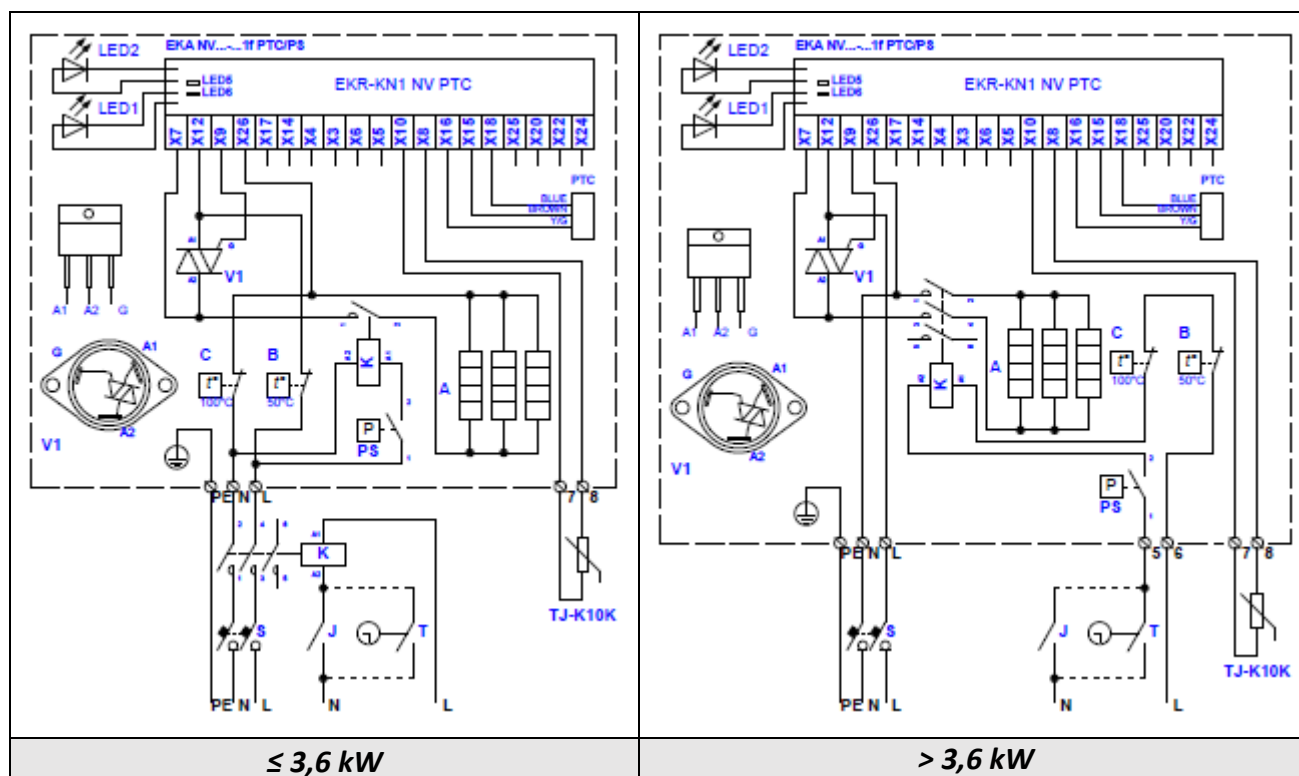


Fig. 28. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f PTC/PS

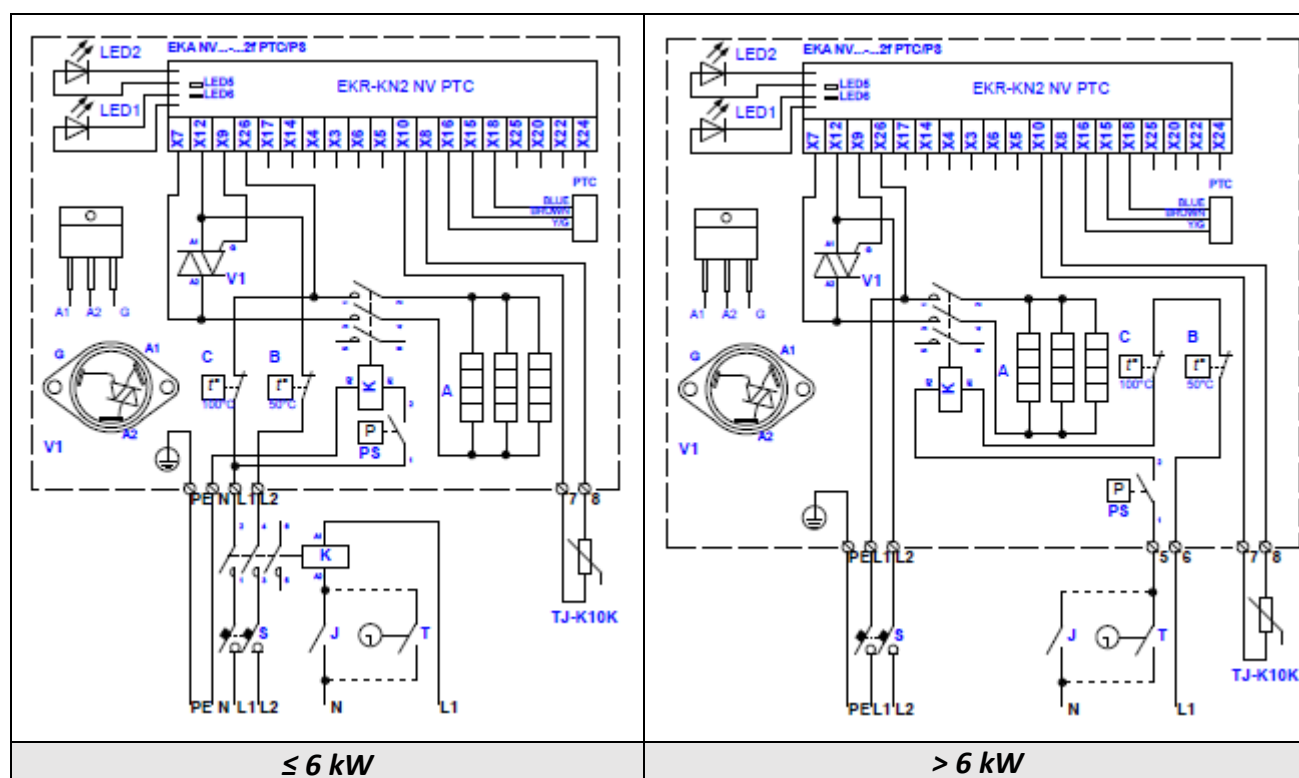


Fig. 29. Electrical wiring diagrams of 2-phase 400V heater EKA NV...-2f PTC/PS

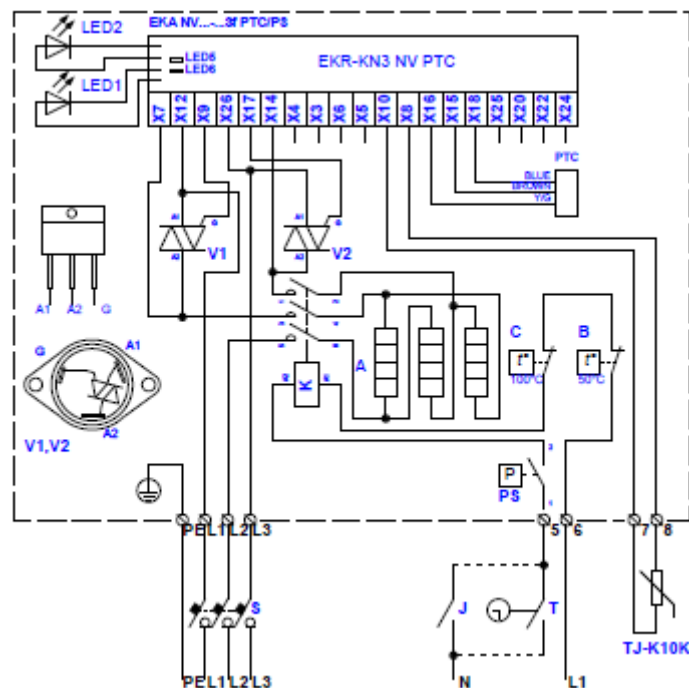


Fig. 30. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f PTC/PS

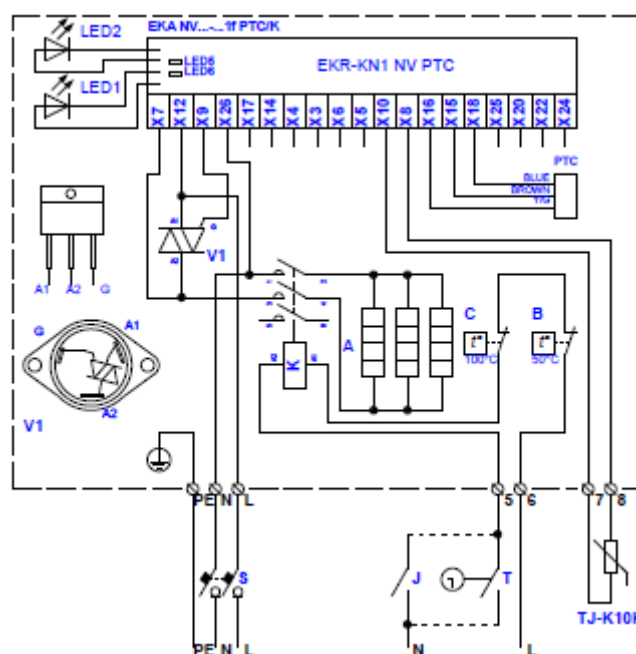


Fig. 31. Electrical wiring diagram of single phase 230V heater EKA NV...-1f PTC/K

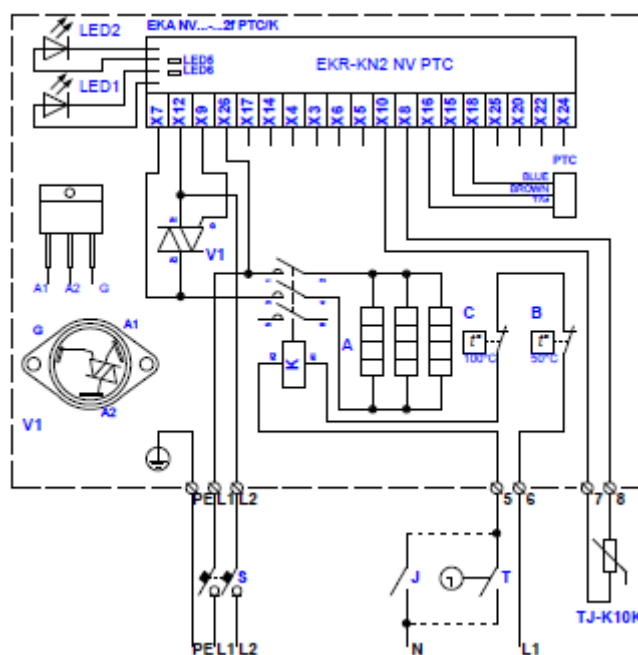


Fig. 32. Electrical wiring diagram of 2-phase 400V heater EKA NV...-2f PTC/K

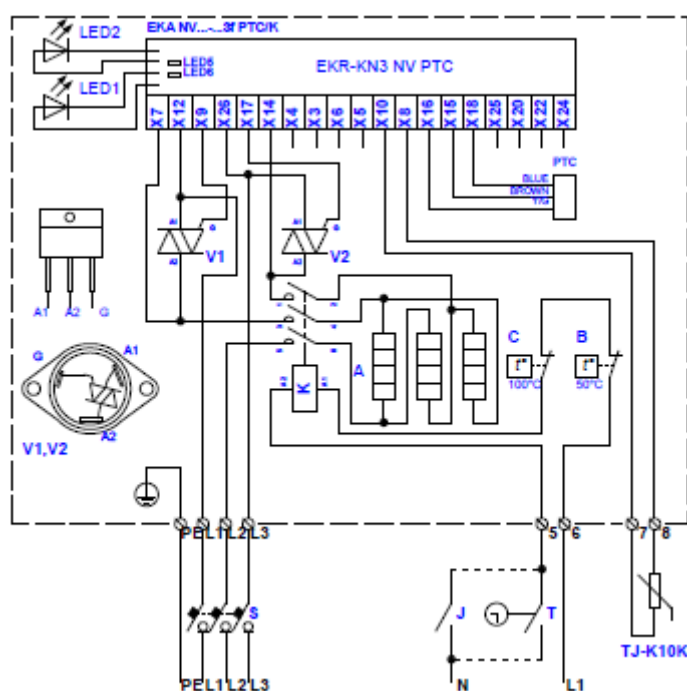


Fig. 33. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f PTC/K

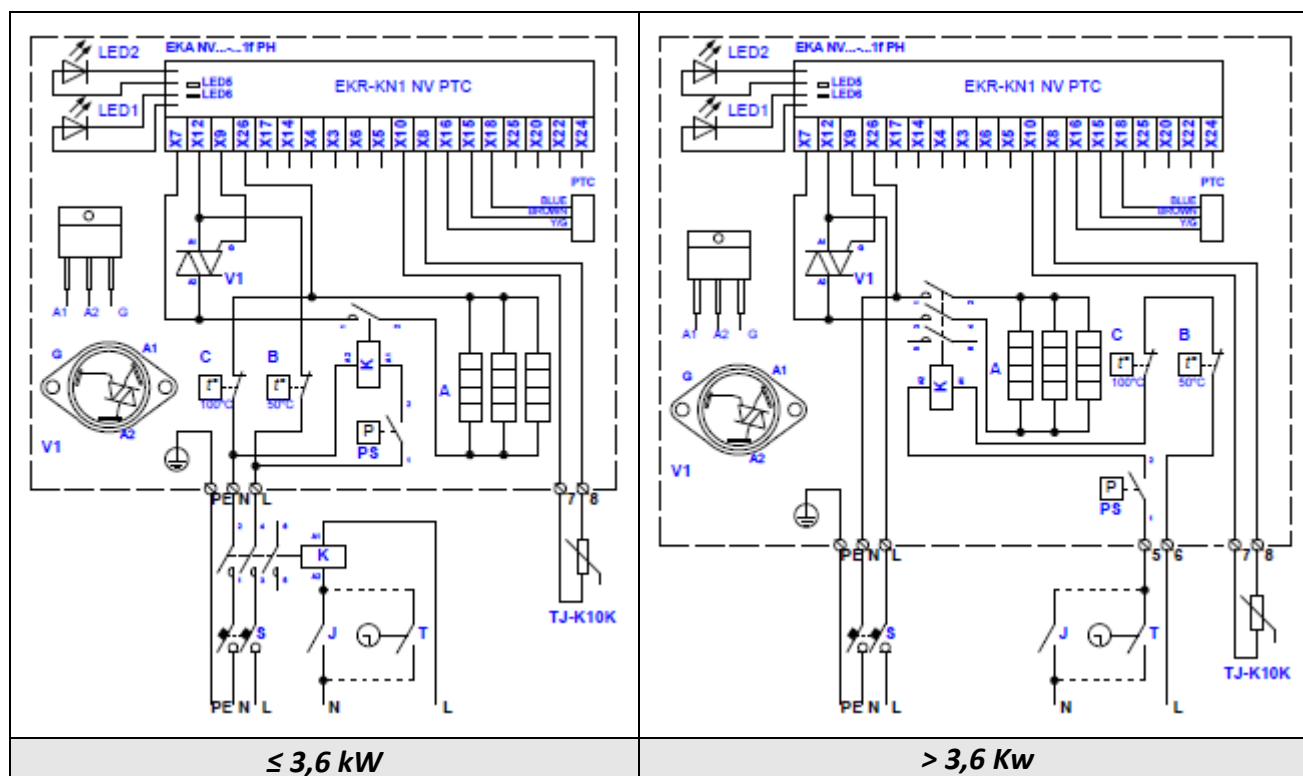


Fig. 34. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f PH

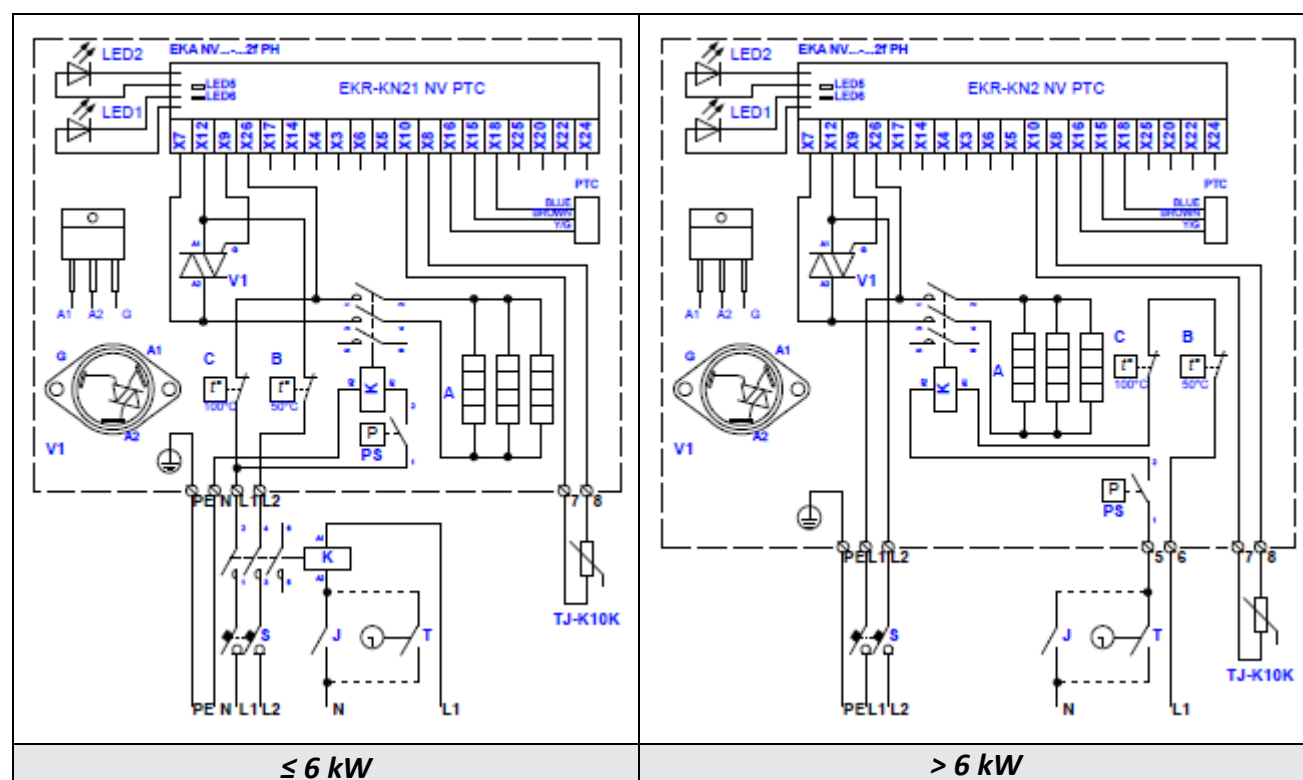


Fig. 35. Electrical wiring diagrams of 2-phase 400V heater EKA NV...-2f PH

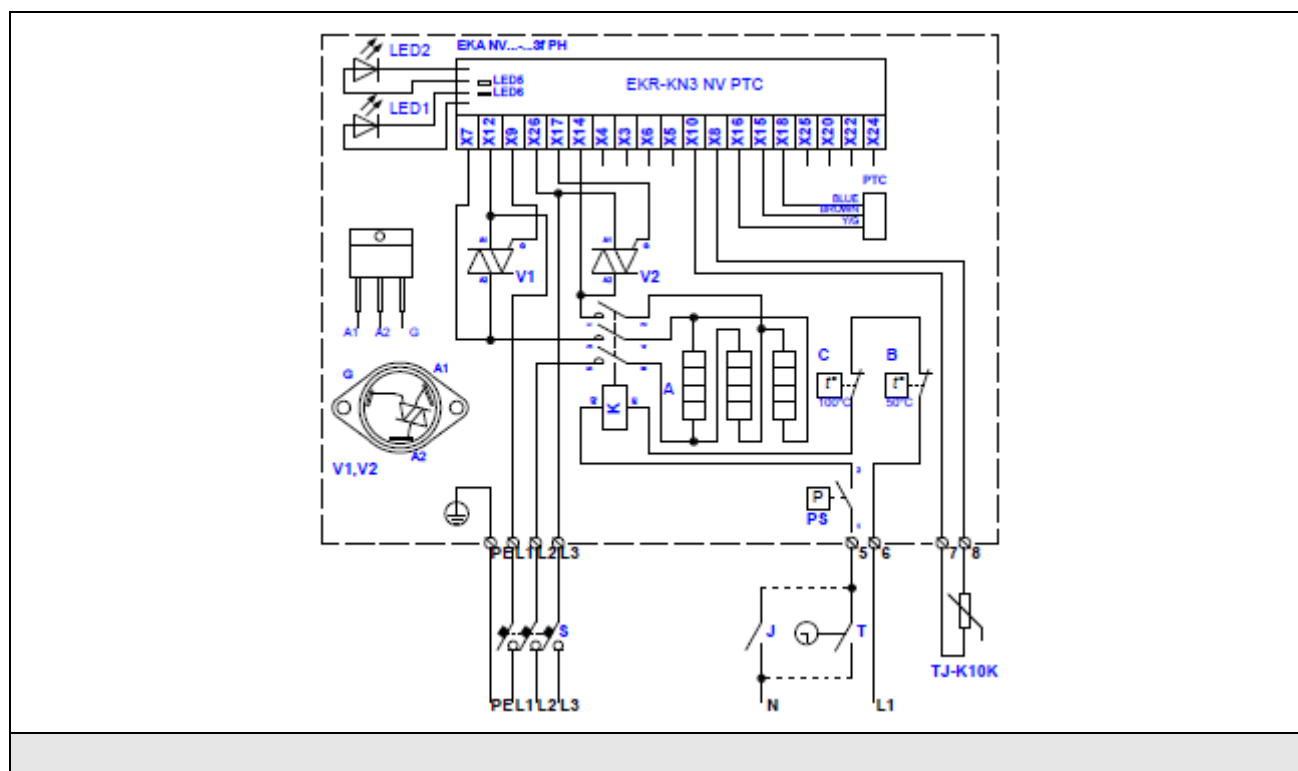


Fig. 36. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f PH

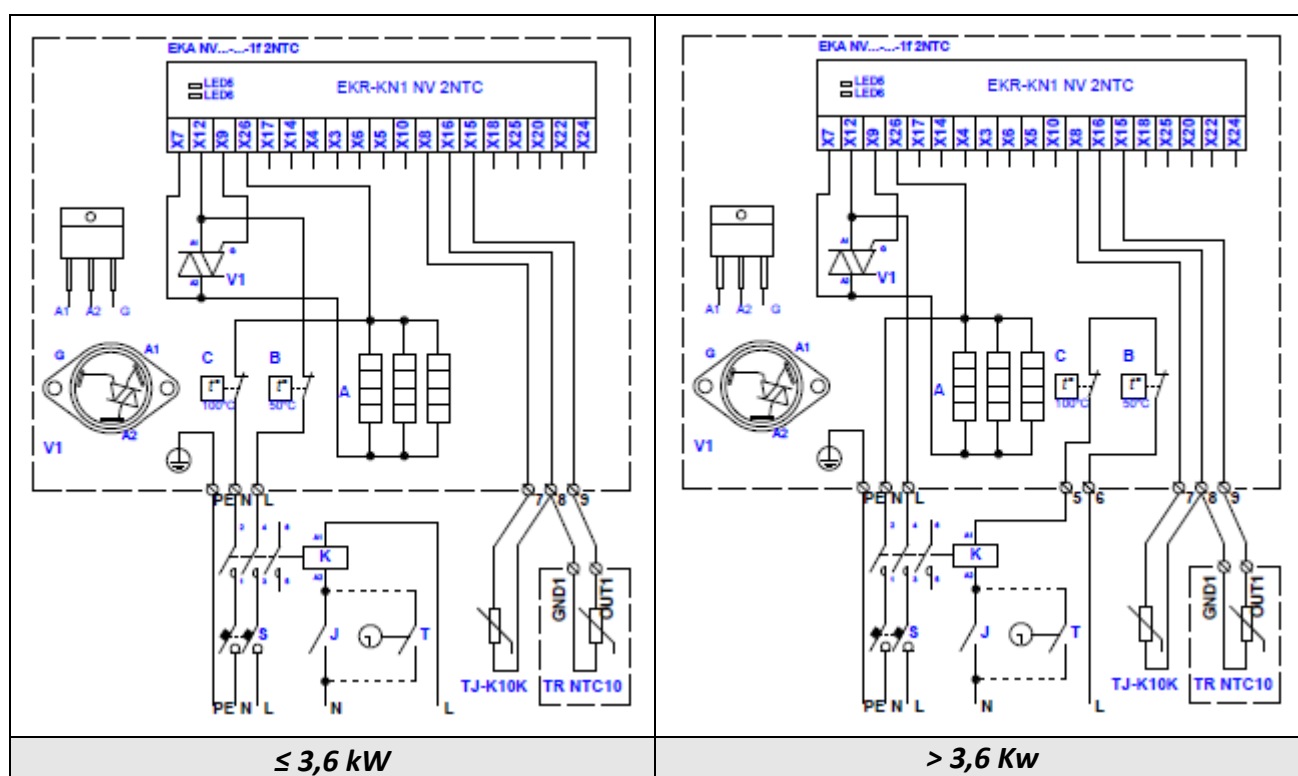
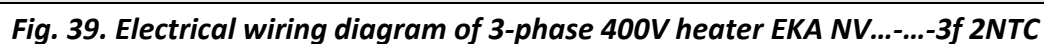
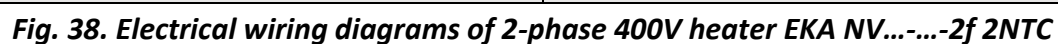


Fig. 37. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f 2NTC



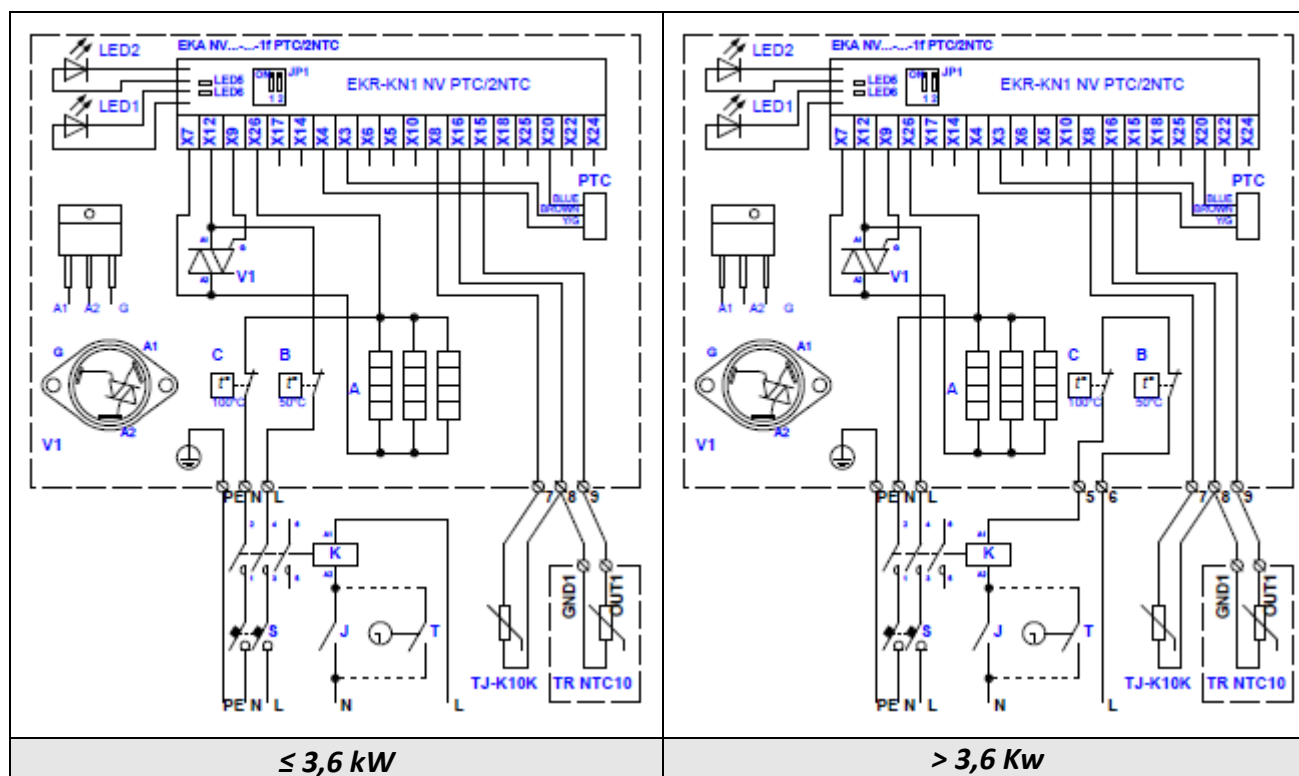


Fig. 40. Electrical wiring diagrams of single phase 230V heater EKA NV...-1f PTC/2NTC

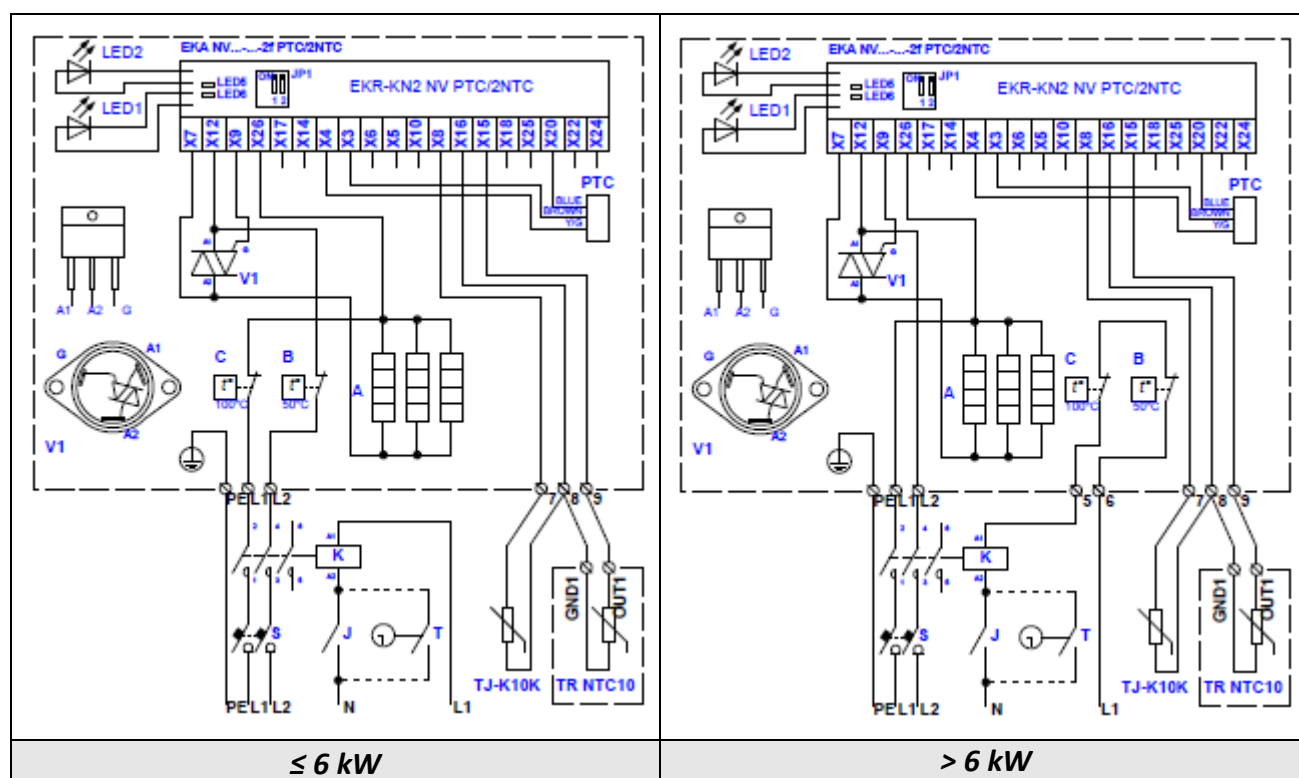


Fig. 41. Electrical wiring diagrams of 2-phase 400V heater EKA NV...-2f PTC/2NTC

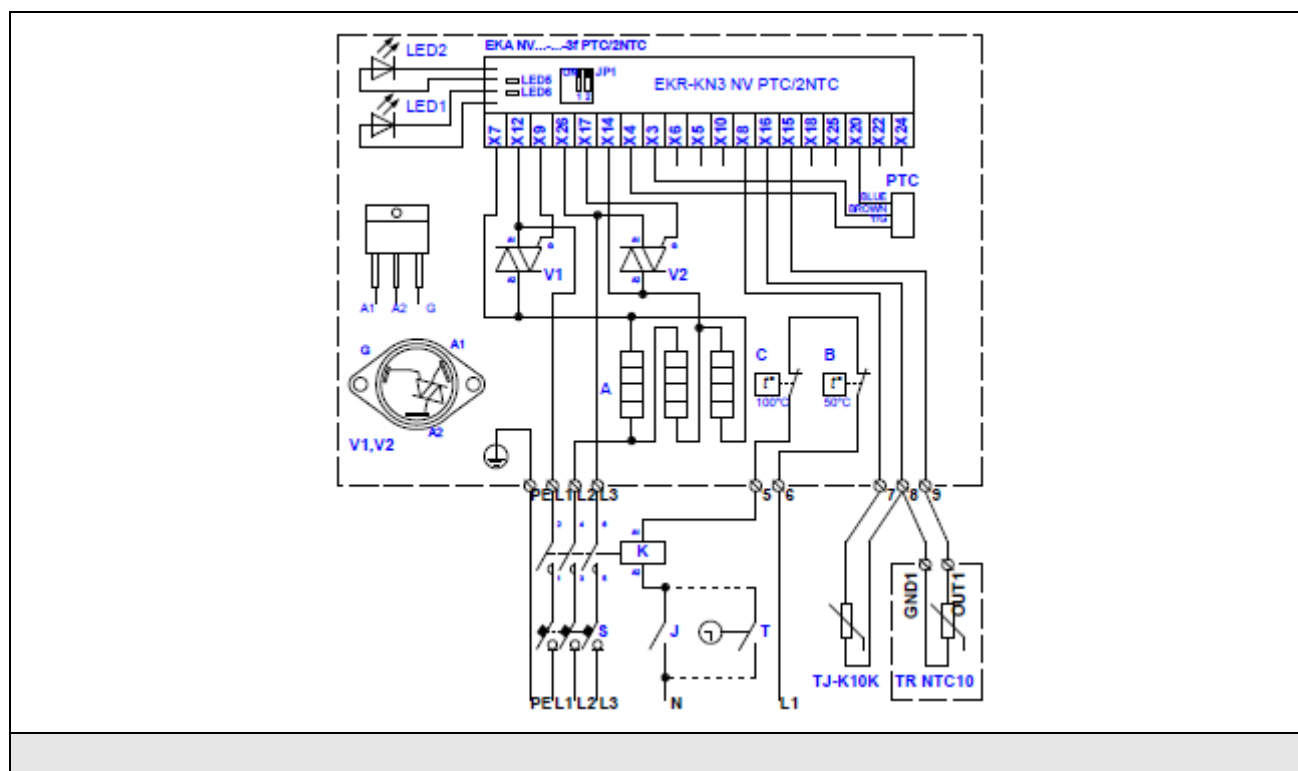


Fig. 42. Electrical wiring diagram of 3-phase 400V heater EKA NV...-3f PTC/2NTC

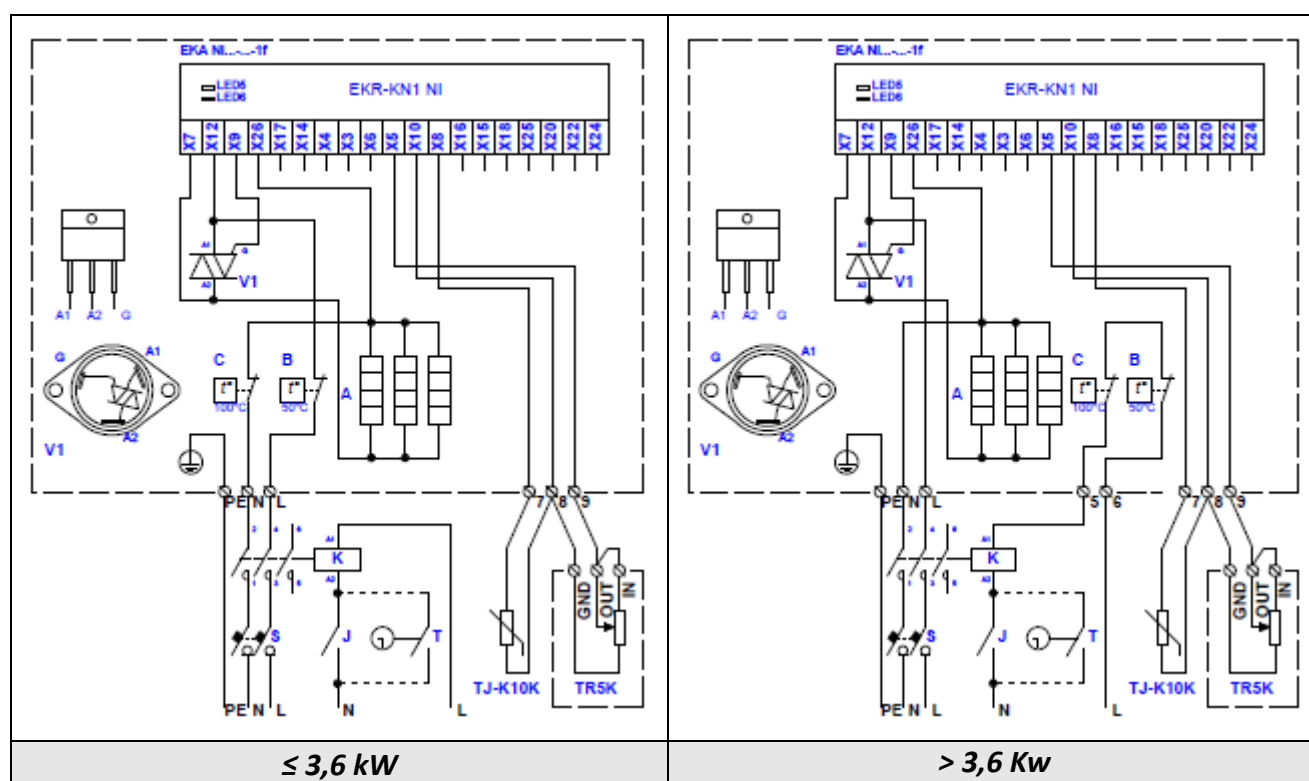


Fig. 43. Electrical wiring diagrams of single phase 230V heater EKA NI...-1f

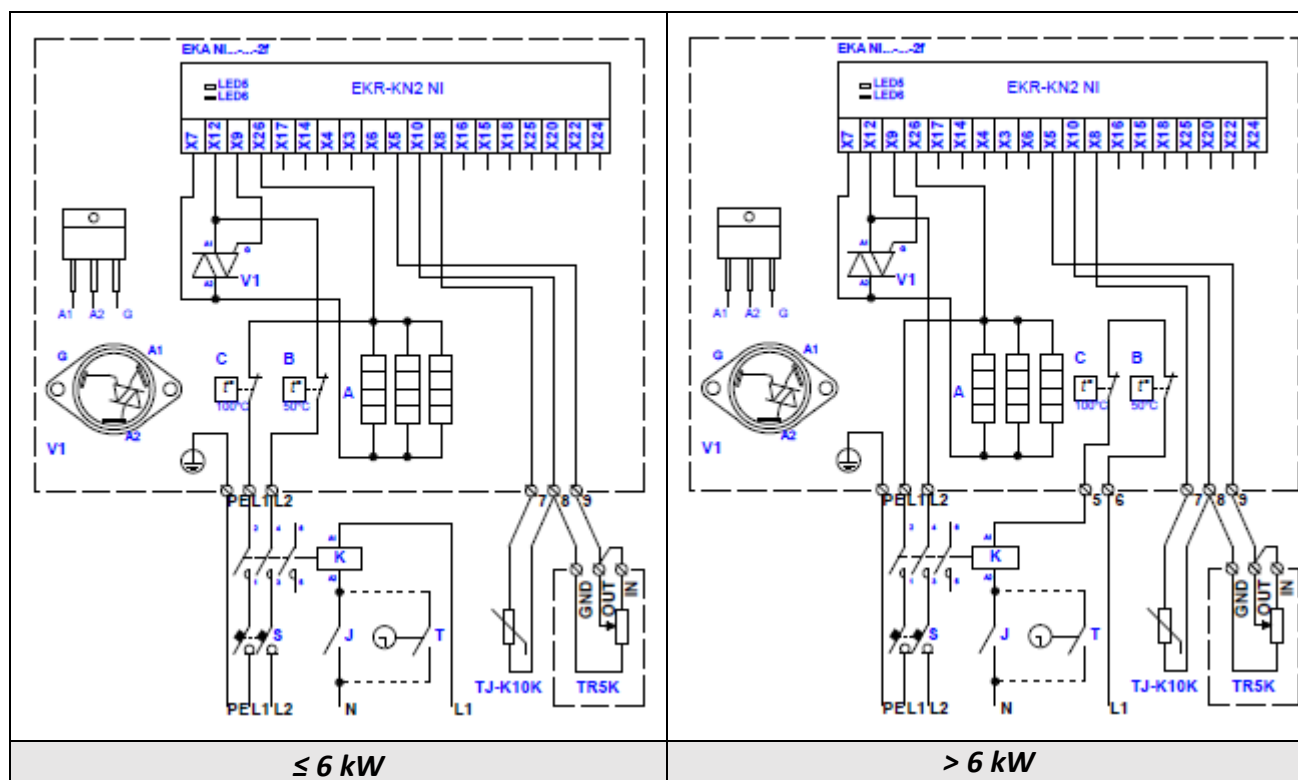


Fig. 44. Electrical wiring diagrams of 2-phase 400V heater EKA NI...-...-2f

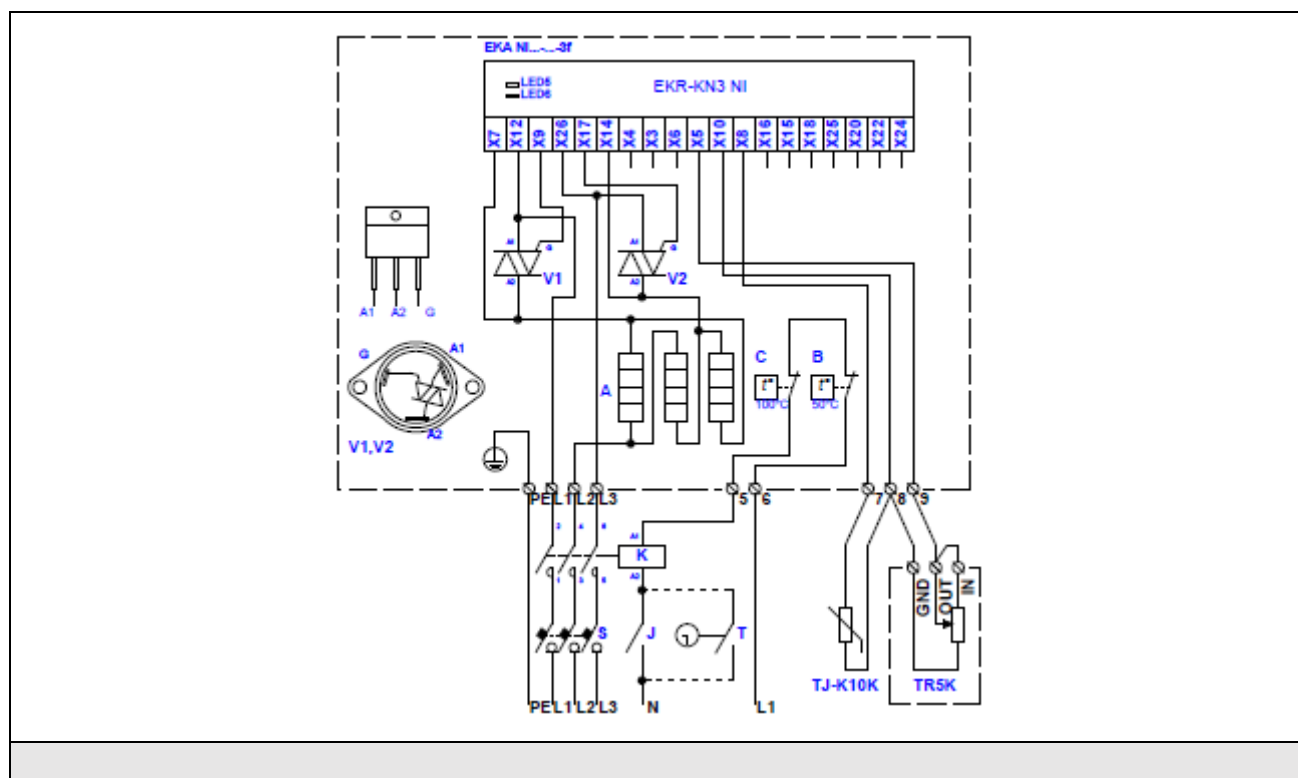


Fig. 45. Electrical wiring diagram of 3-phase 400V heater EKA NI...-...-3f

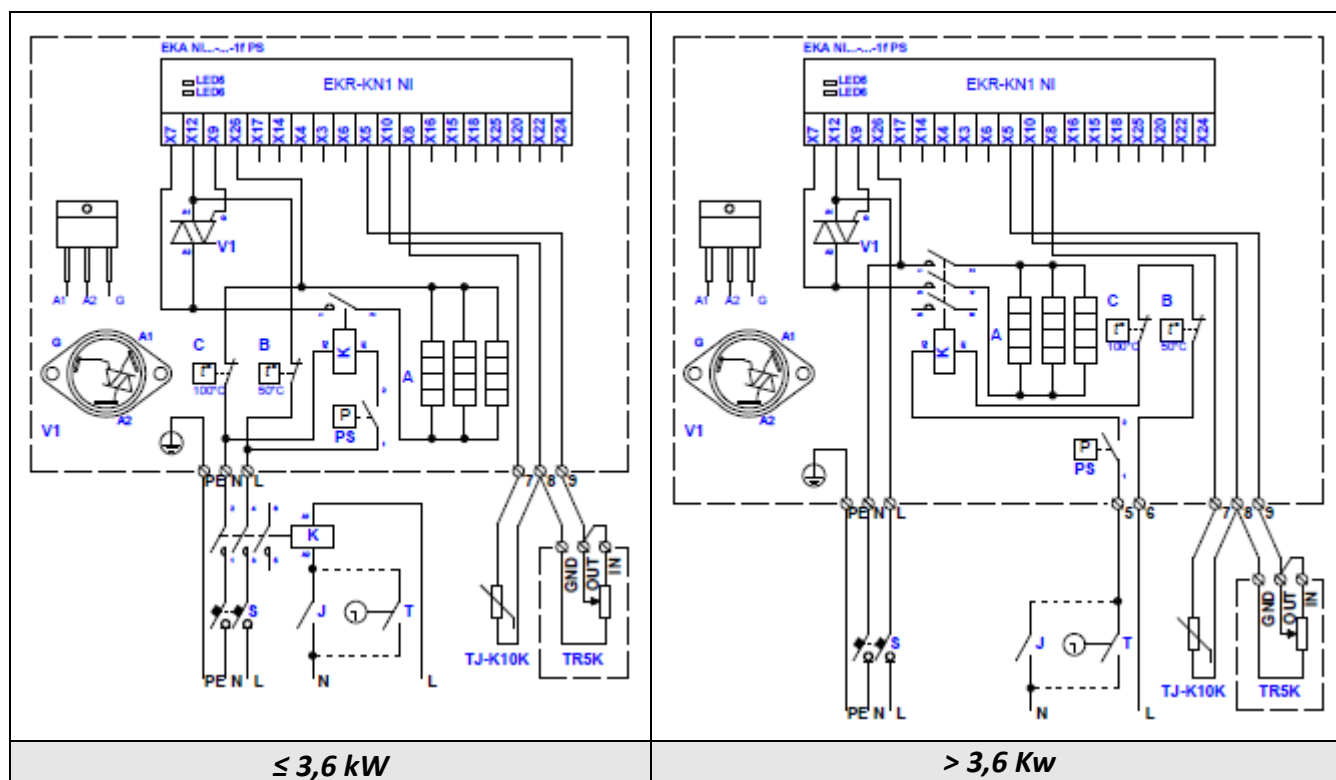


Fig. 46. Electrical wiring diagrams of single phase 230V heater EKA NI...-1f PS

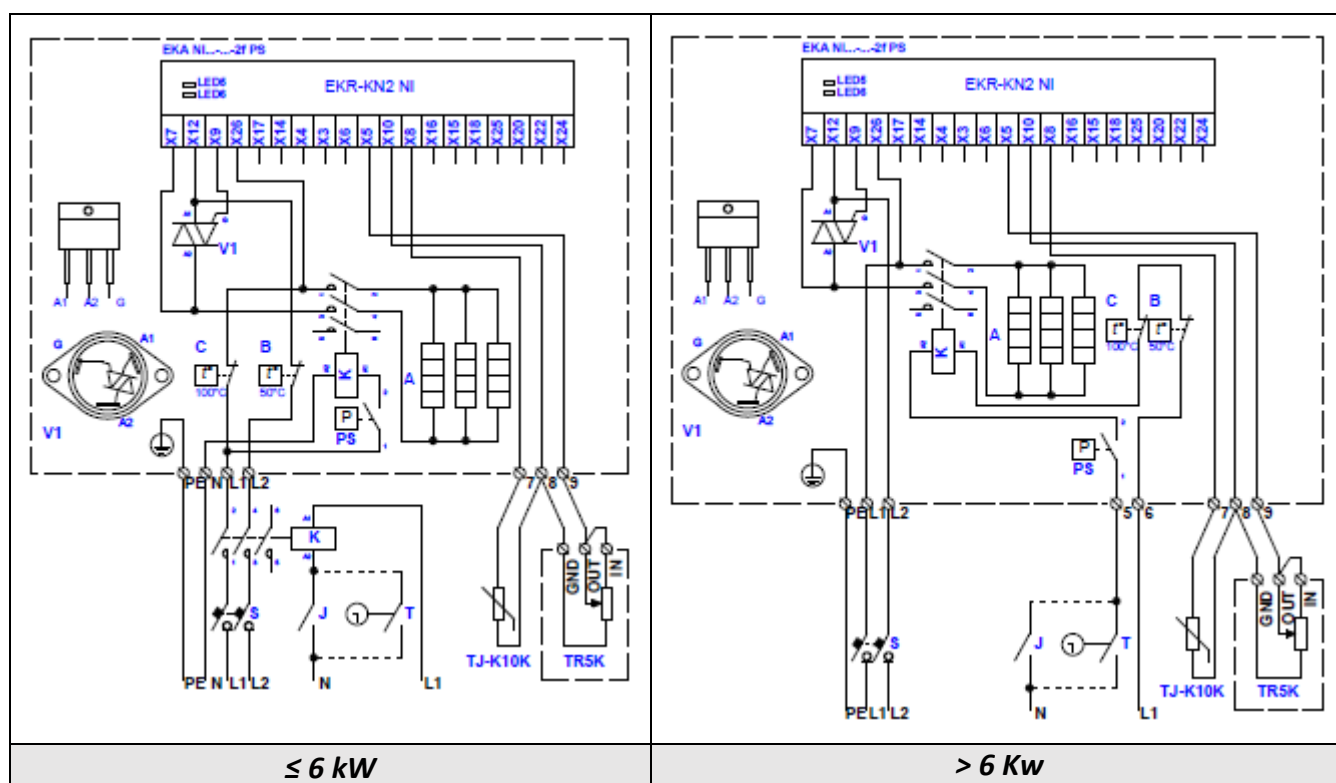


Fig. 47. Electrical wiring diagrams of 2-phase 400V heater EKA NI...-2f PS

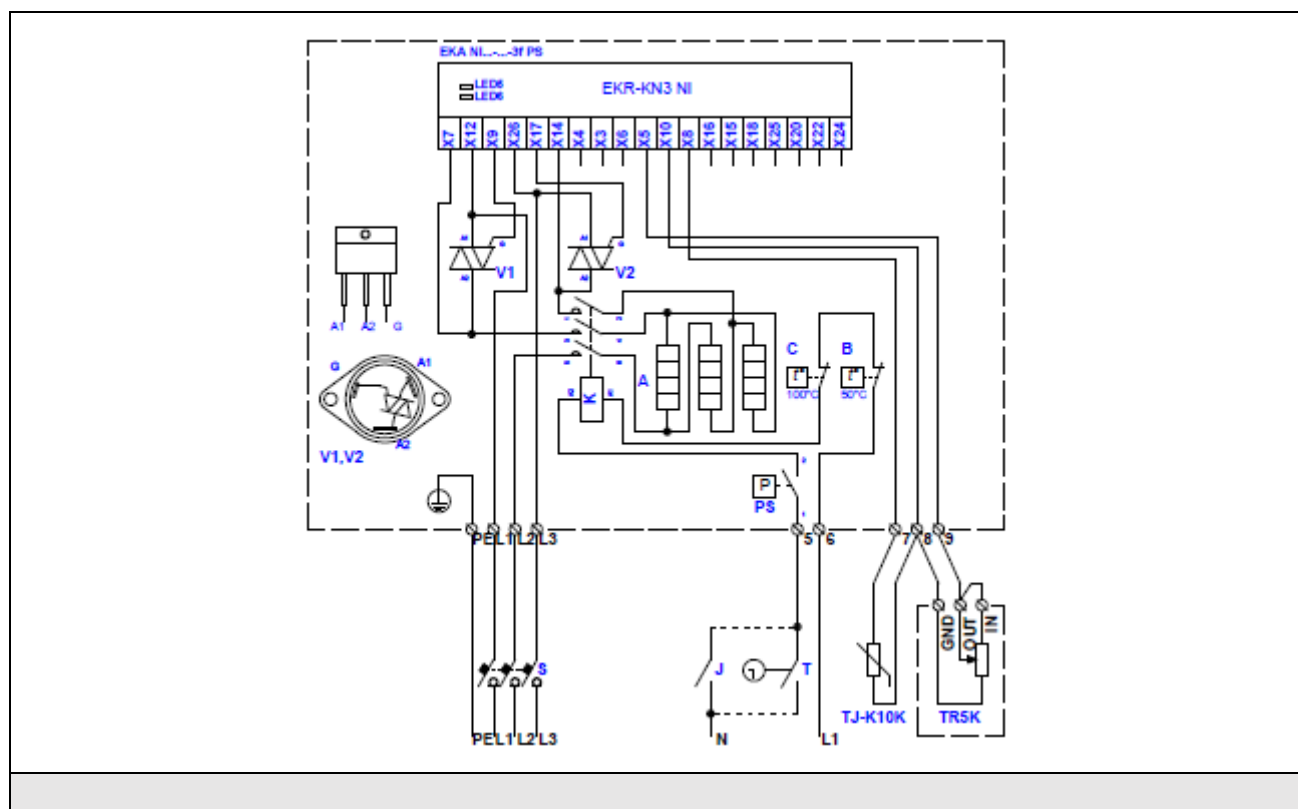


Fig. 48. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f PS

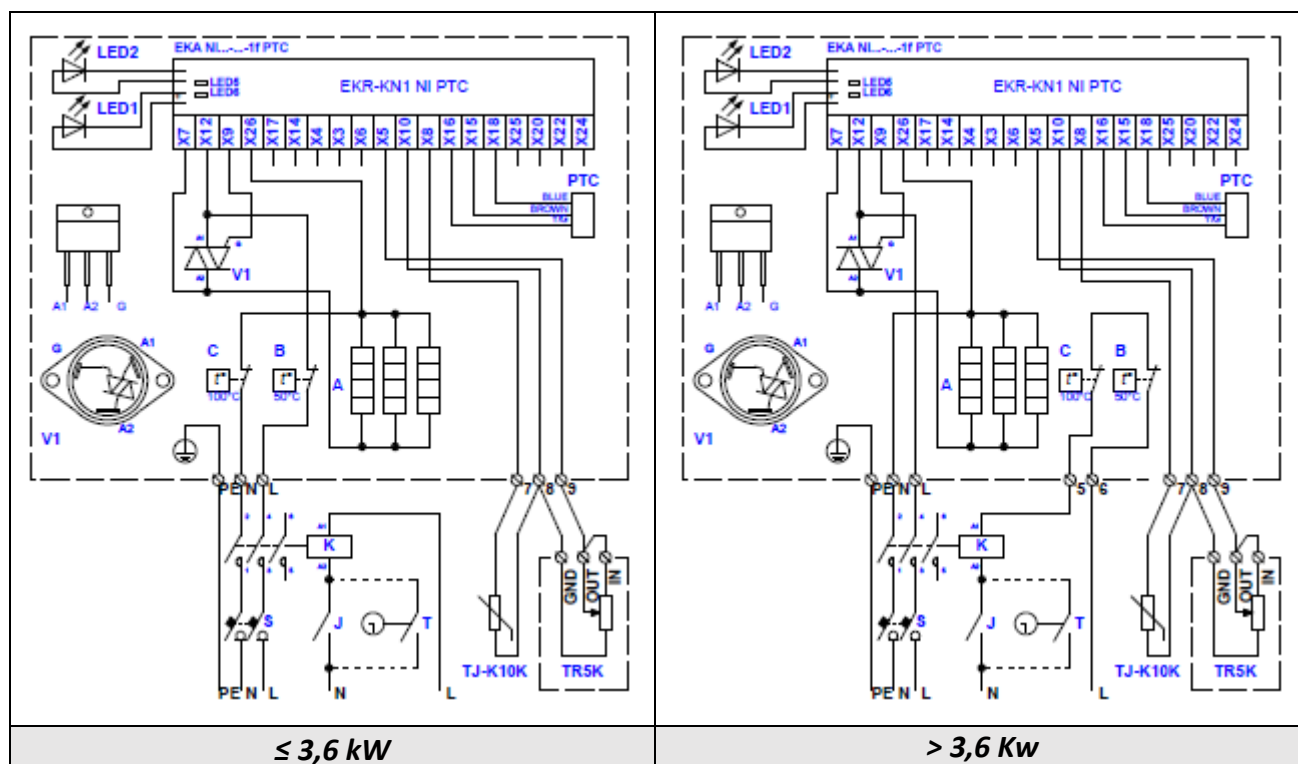


Fig. 49. Electrical wiring diagrams of single phase 230V heater EKA NI...-1f PTC

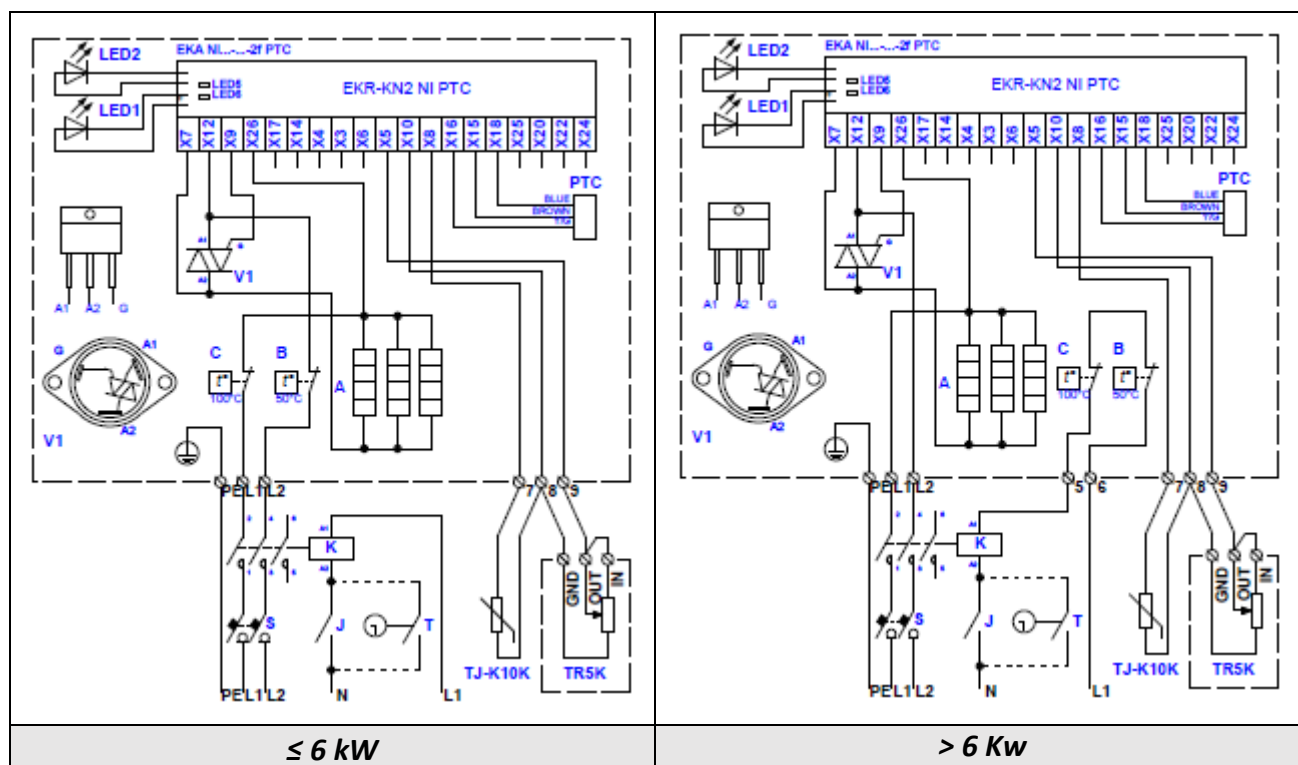


Fig. 50. Electrical wiring diagrams of 2-phase 400V heater EKA NI...-2f PTC

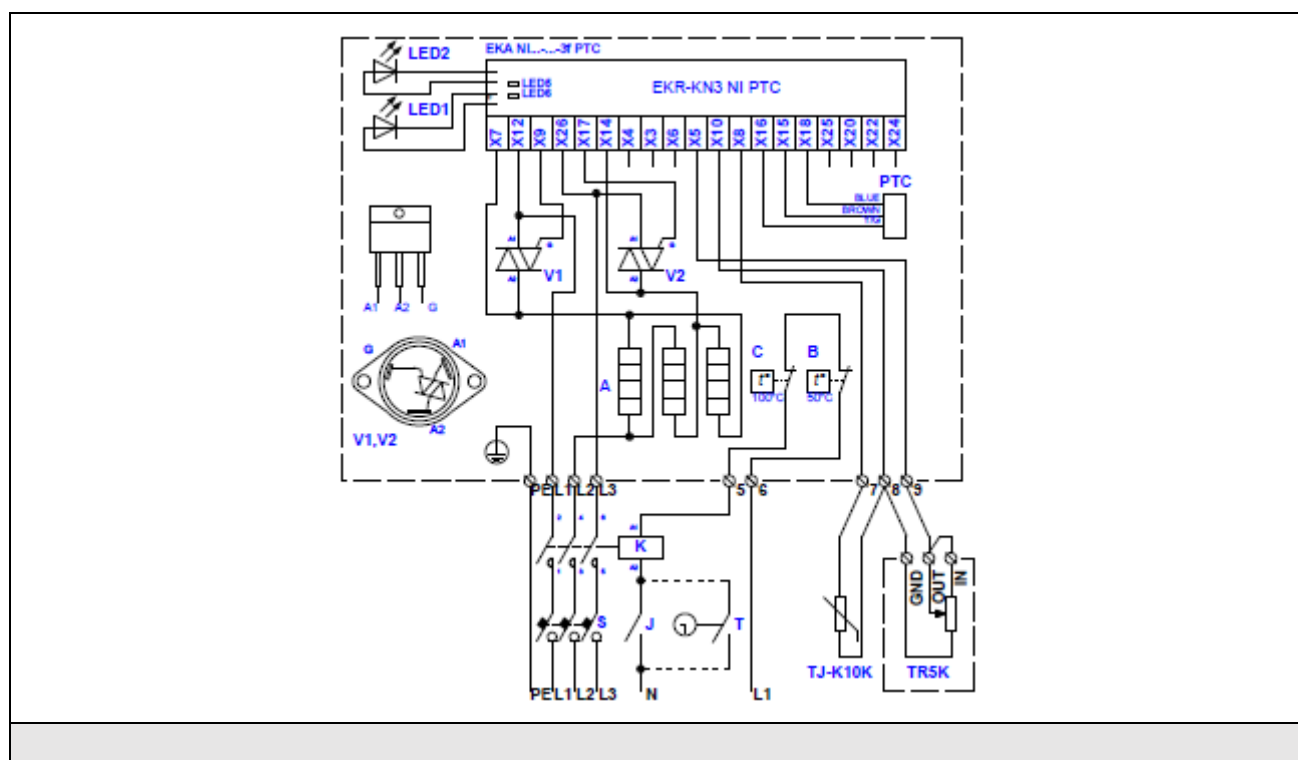


Fig. 51. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f PTC

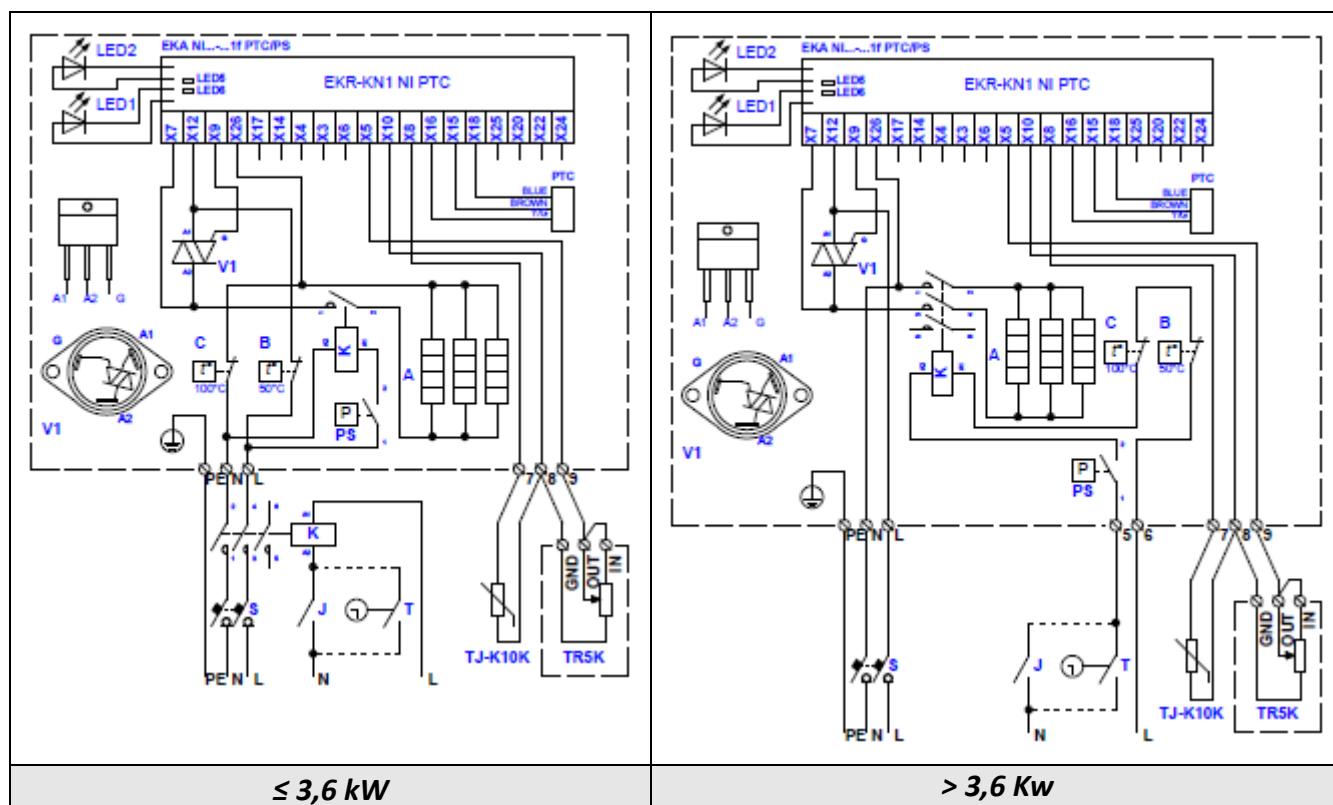


Fig. 52. Electrical wiring diagrams of single phase 230V heater EKA NI...-1f PTC/PS

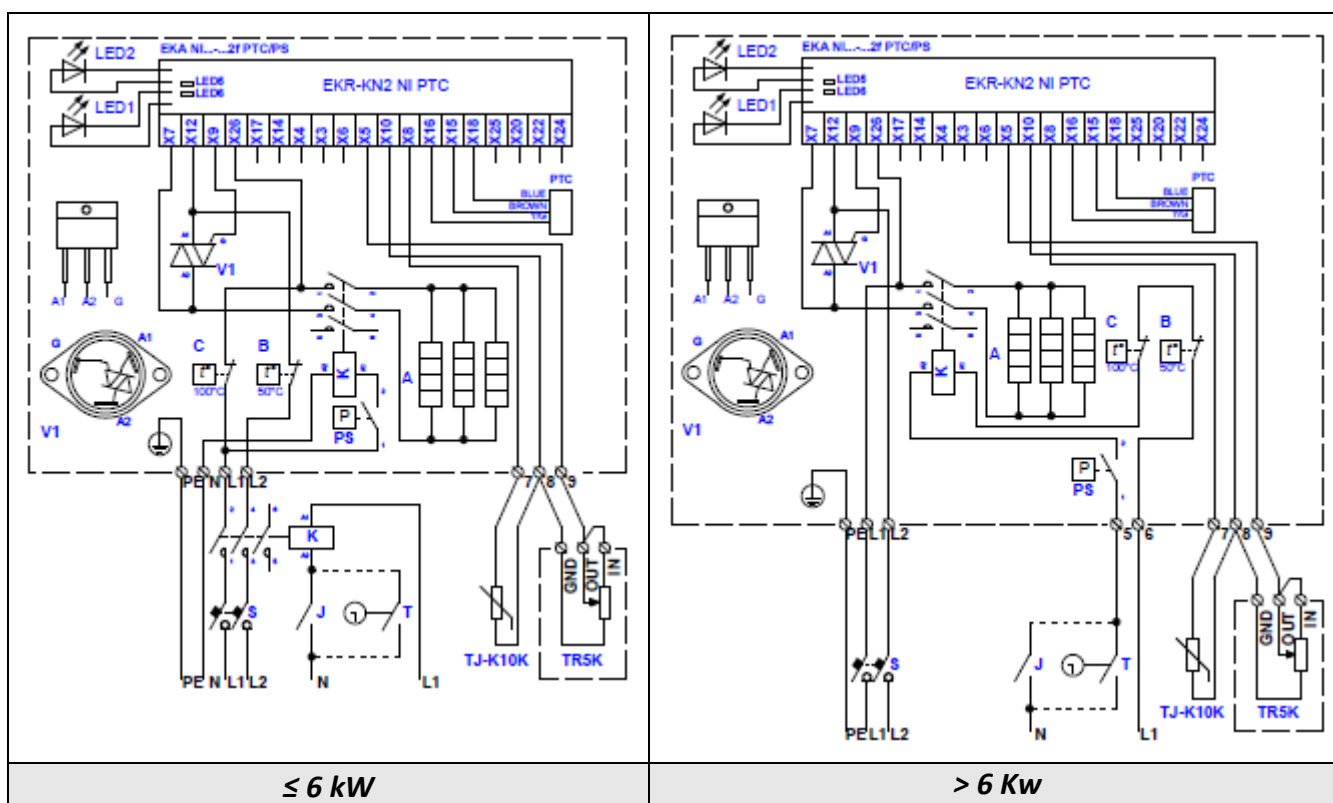


Fig. 53. Electrical wiring diagrams of 2-phase 400V heater EKA NI...-2f PTC/PS

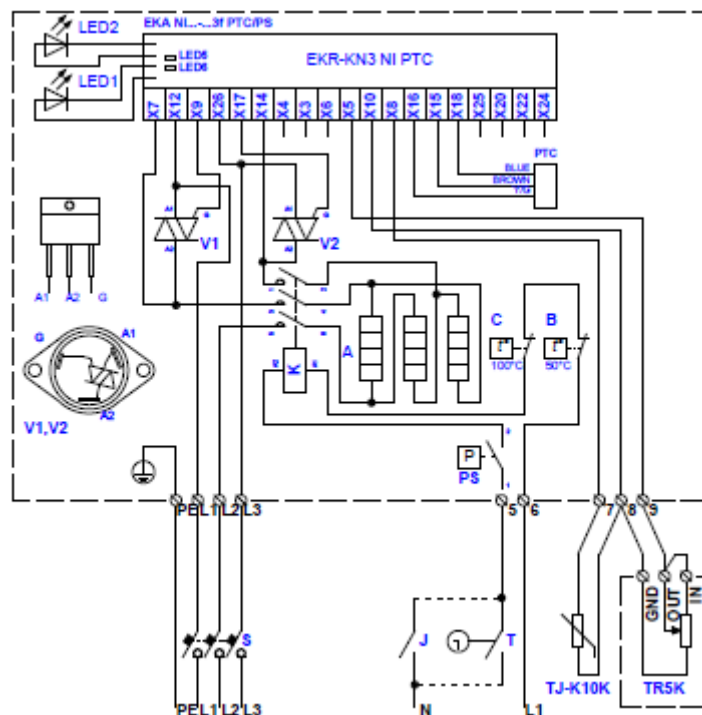


Fig. 54. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f PTC/PS

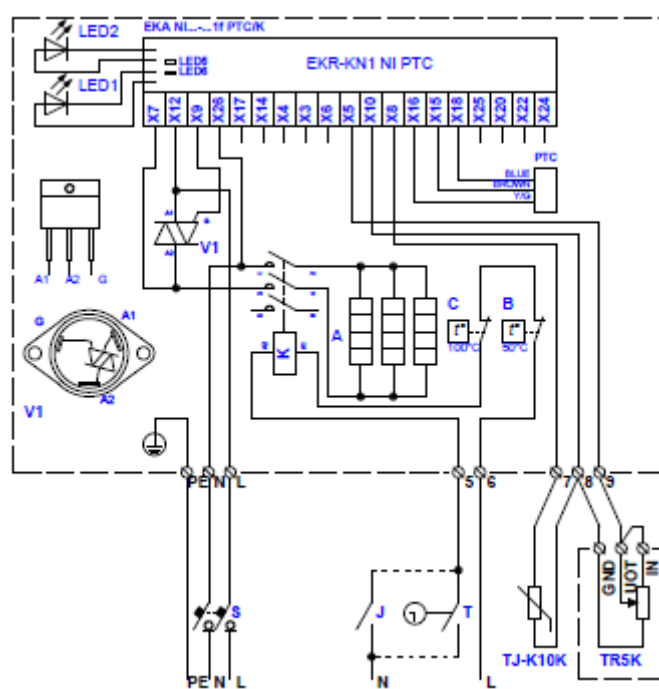


Fig. 55. Electrical wiring diagram of single phase 230V heater EKA NI...-1f PTC/K

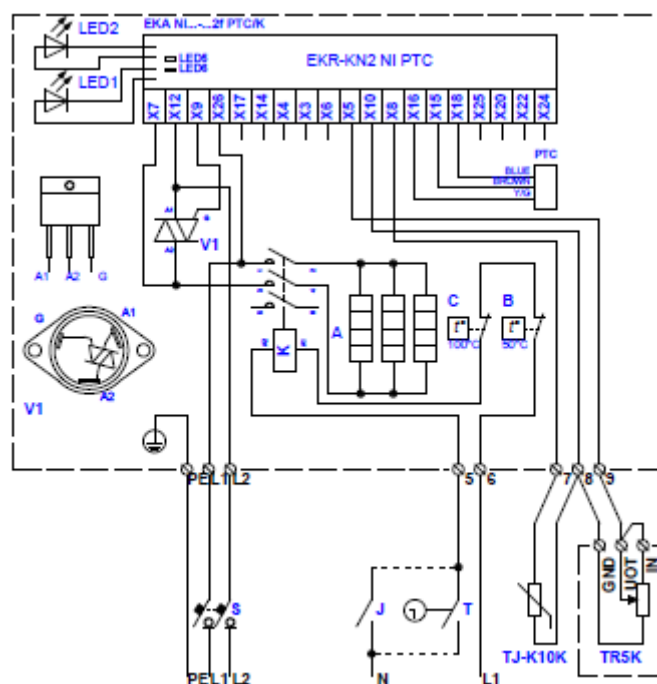


Fig. 56. Electrical wiring diagram of 2-phase 400V heater EKA NI...-2f PTC/K

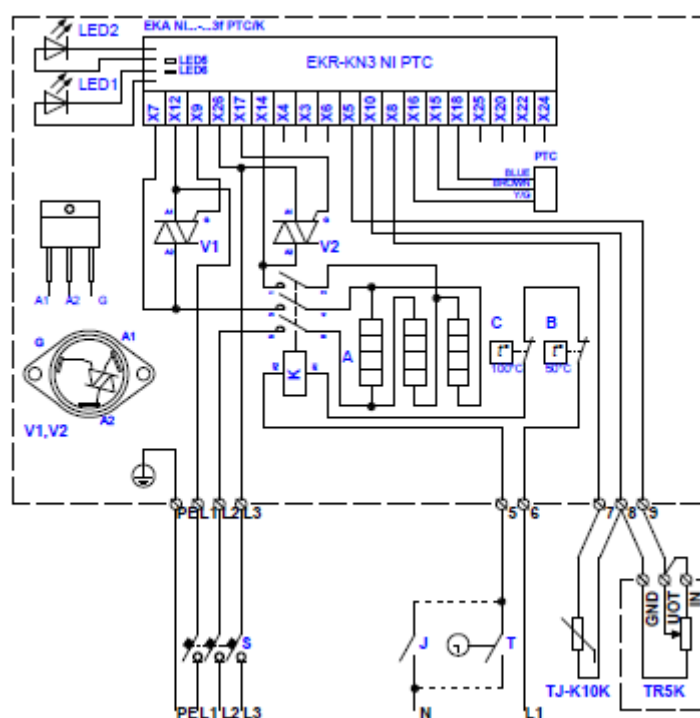


Fig. 57. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f PTC/K

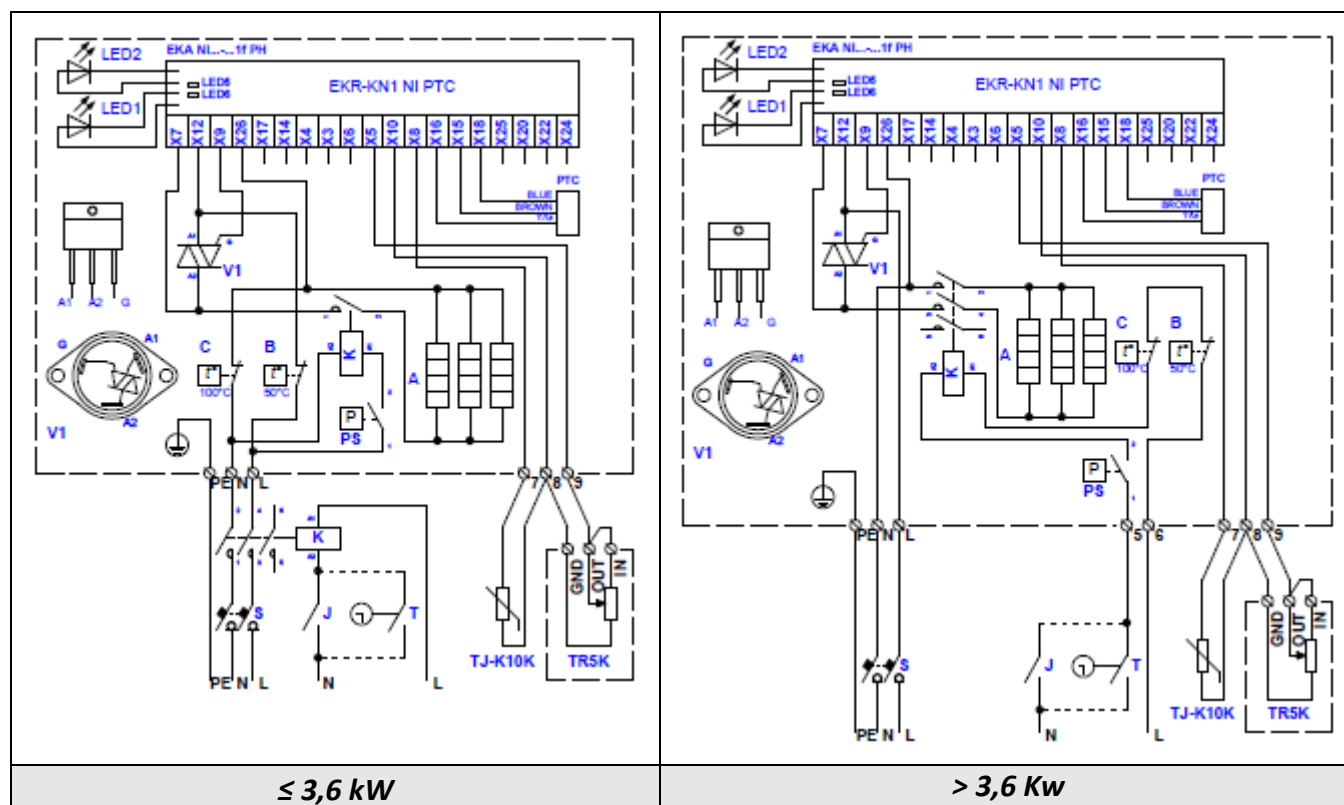


Fig. 58. Electrical wiring diagrams of single phase 230V heater EKA NI...-1f PH

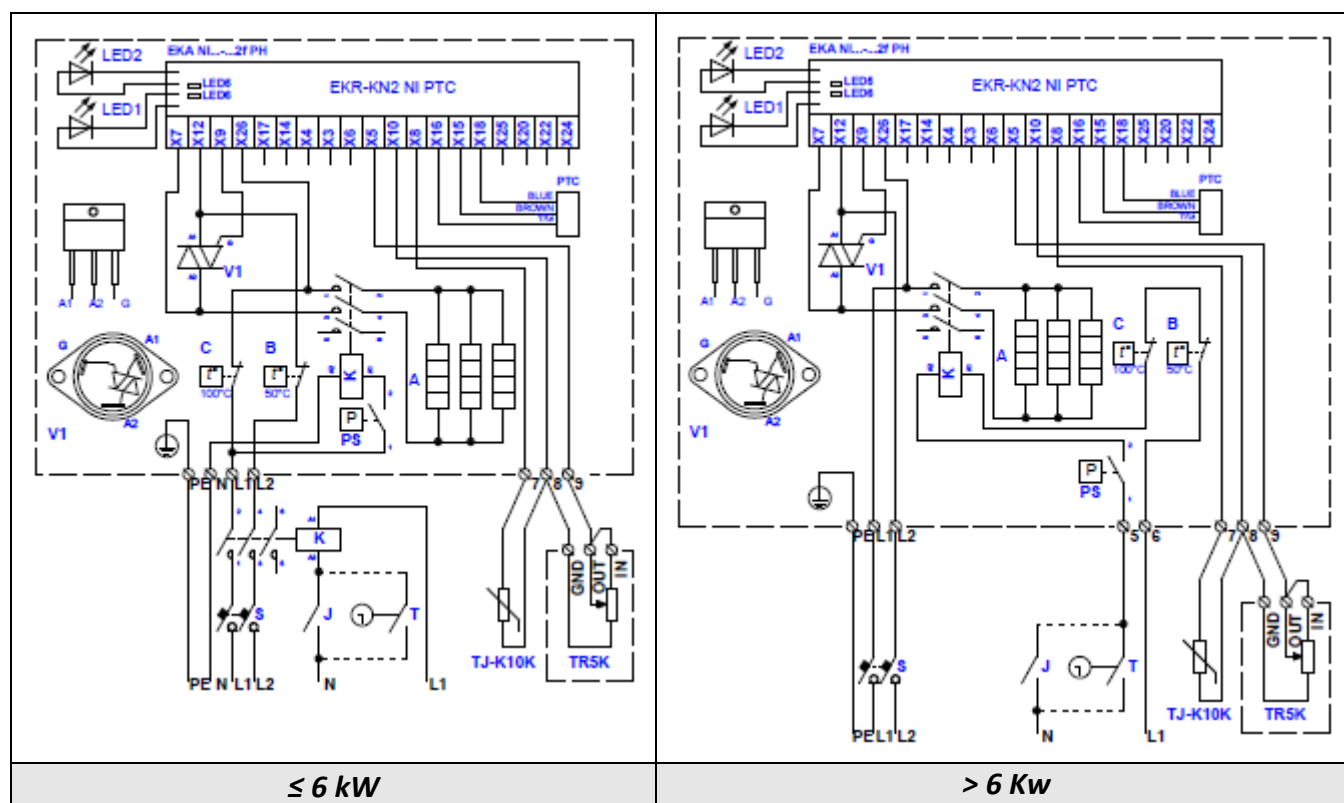


Fig. 59. Electrical wiring diagrams of 2-phase 400V heater EKA NI...-2f PH

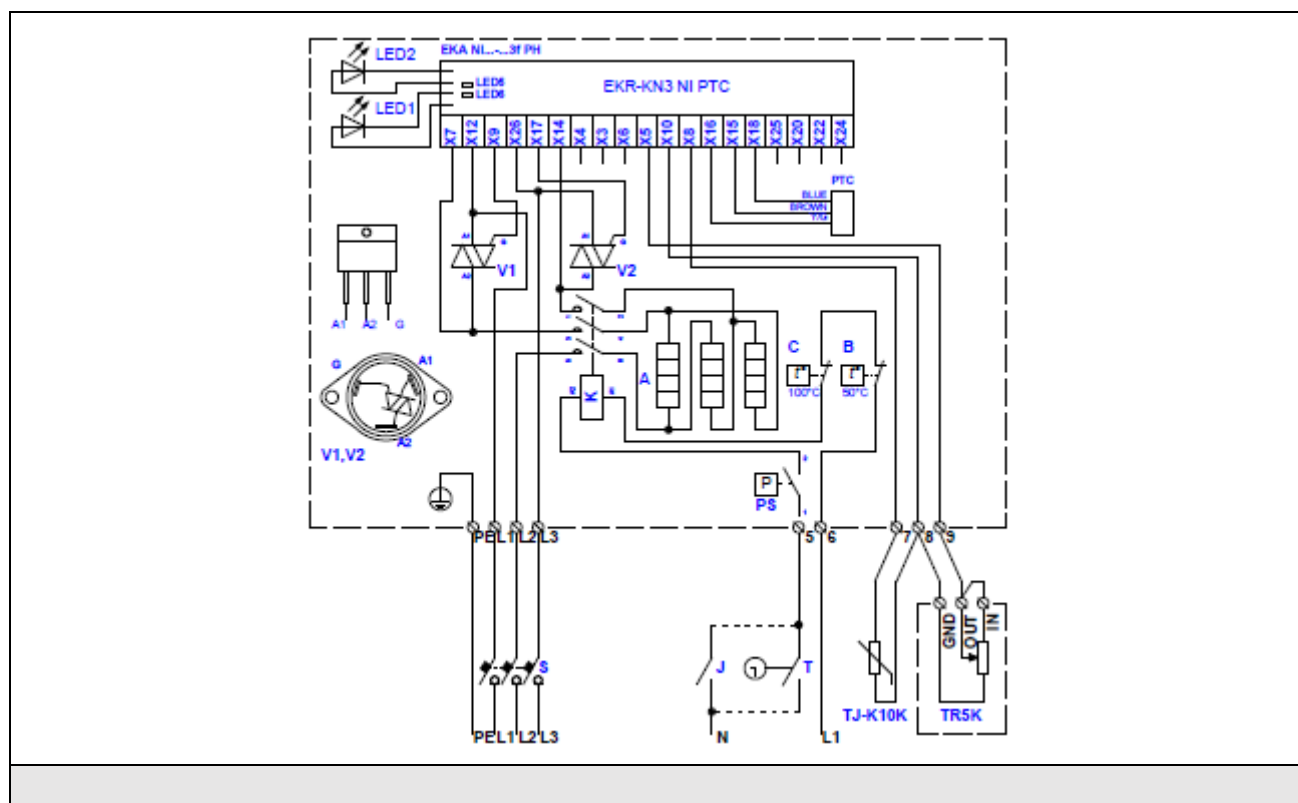


Fig. 60. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f PH

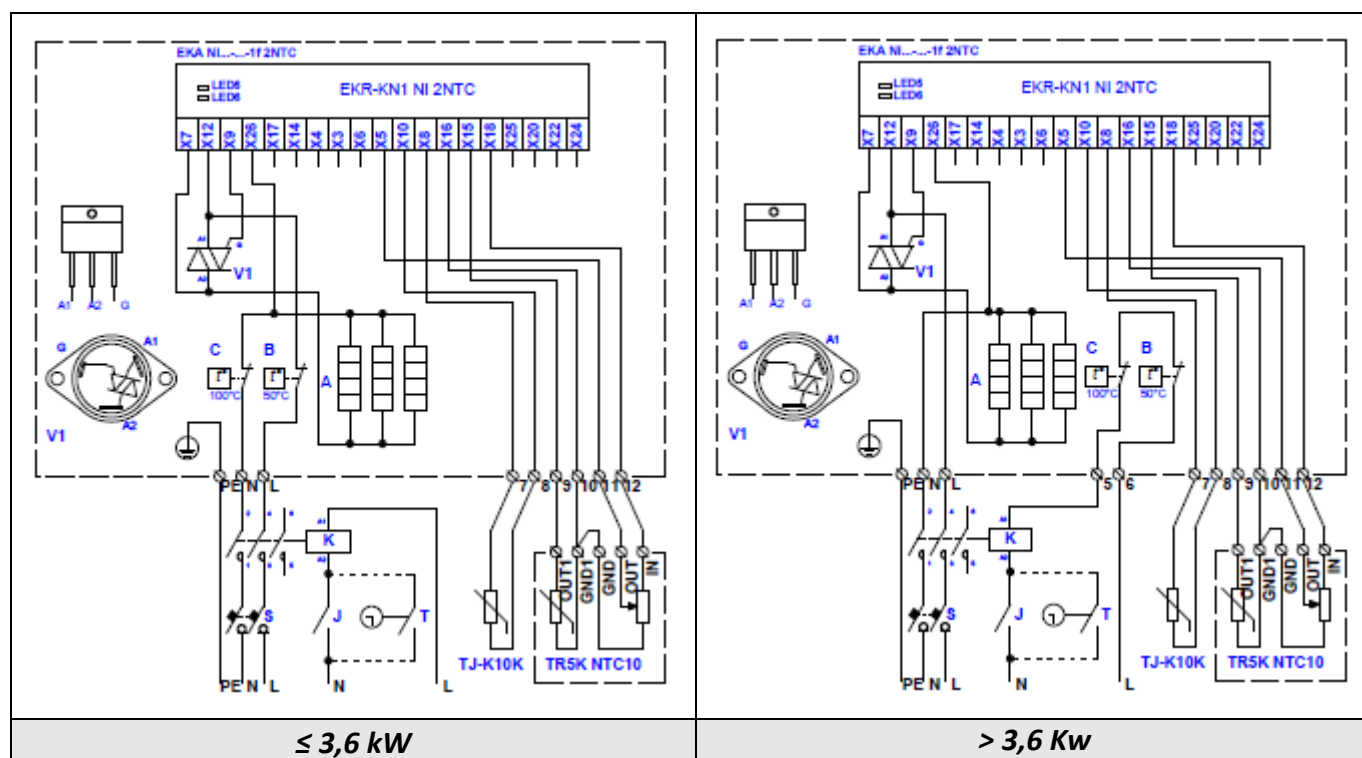


Fig. 61. Electrical wiring diagrams of single phase 230V heater EKA NI...-1f 2NTC

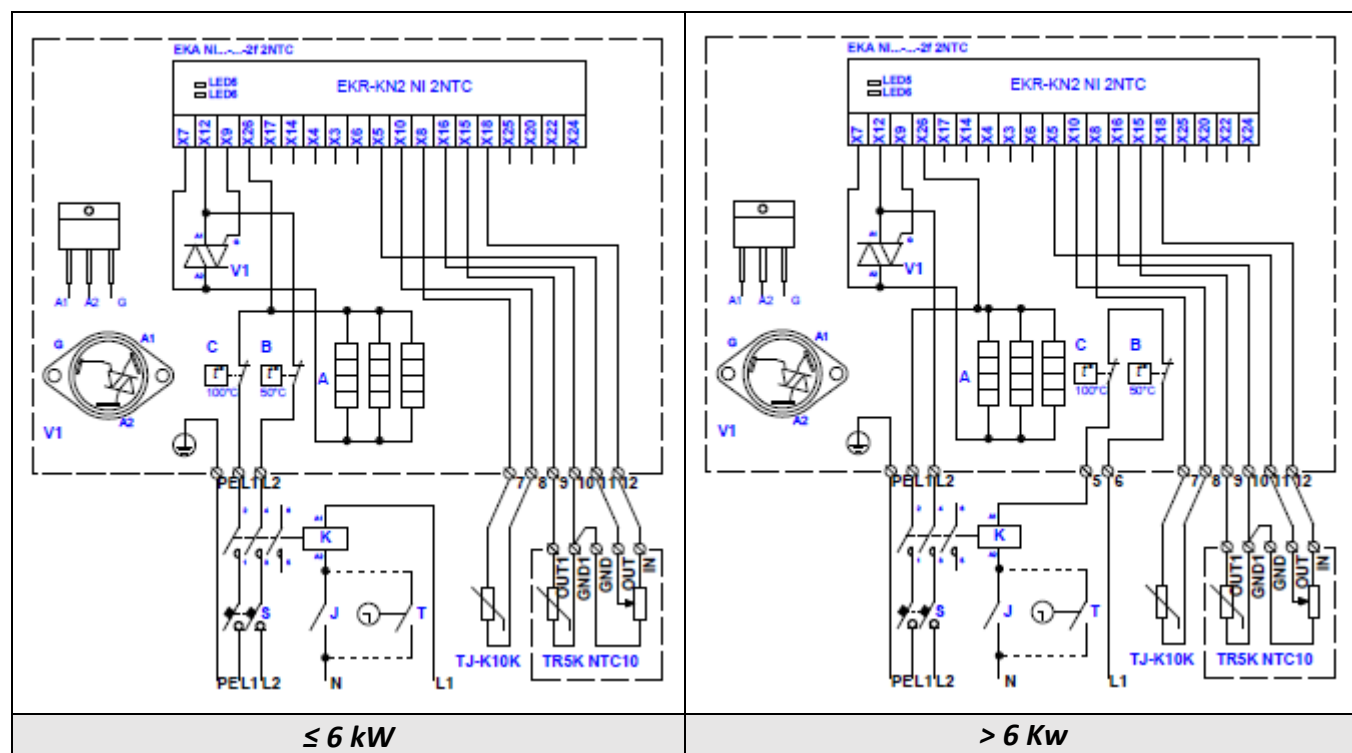


Fig. 62. Electrical wiring diagrams of 2-phase 400V heater EKA NI...-2f 2NTC

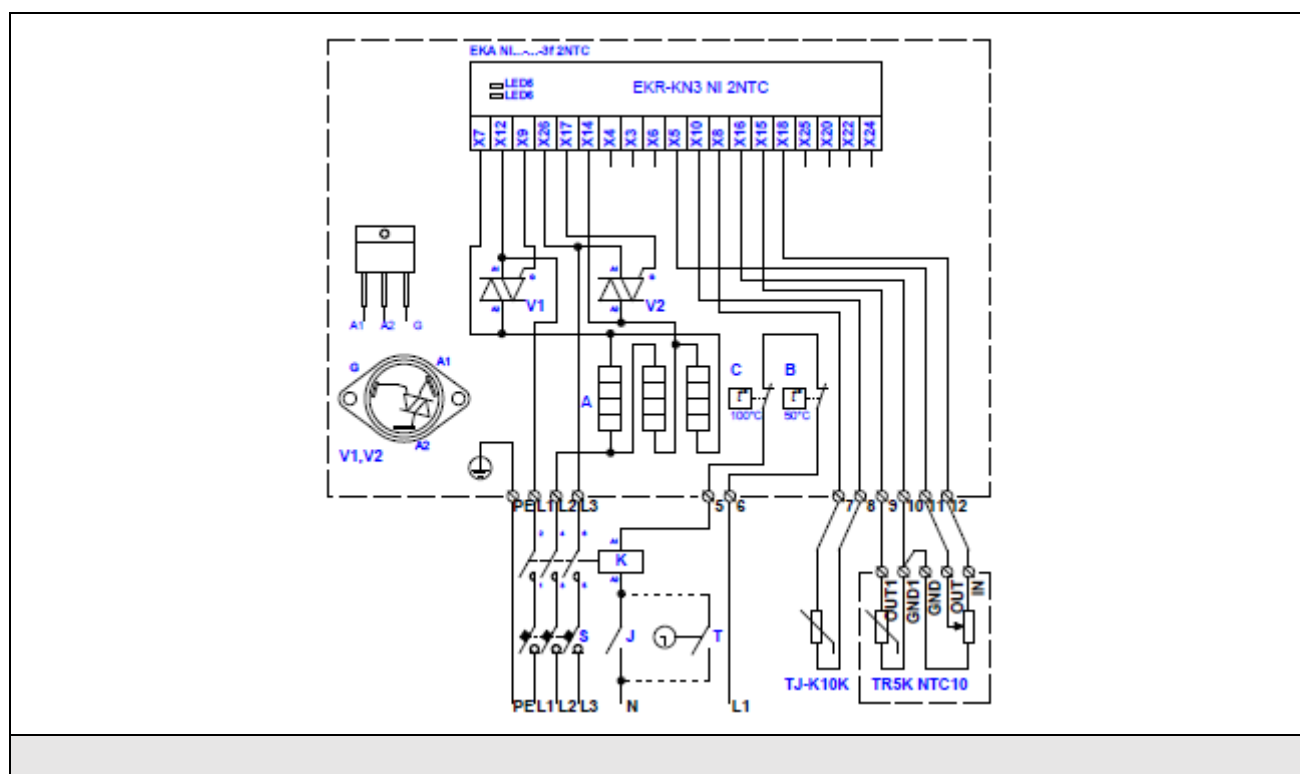


Fig. 63. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f 2NTC

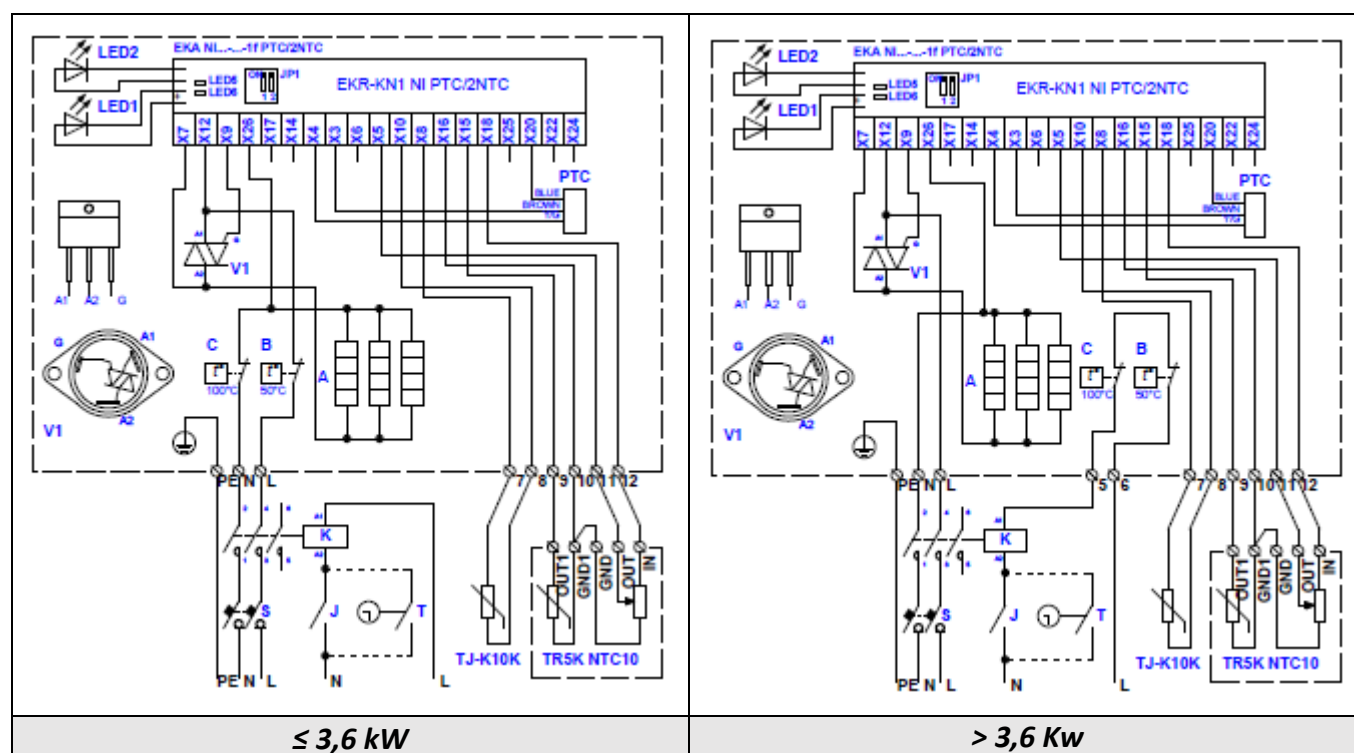


Fig. 64. Electrical wiring diagrams of single phase 230V heater EKA NI....-1f PTC/2NTC

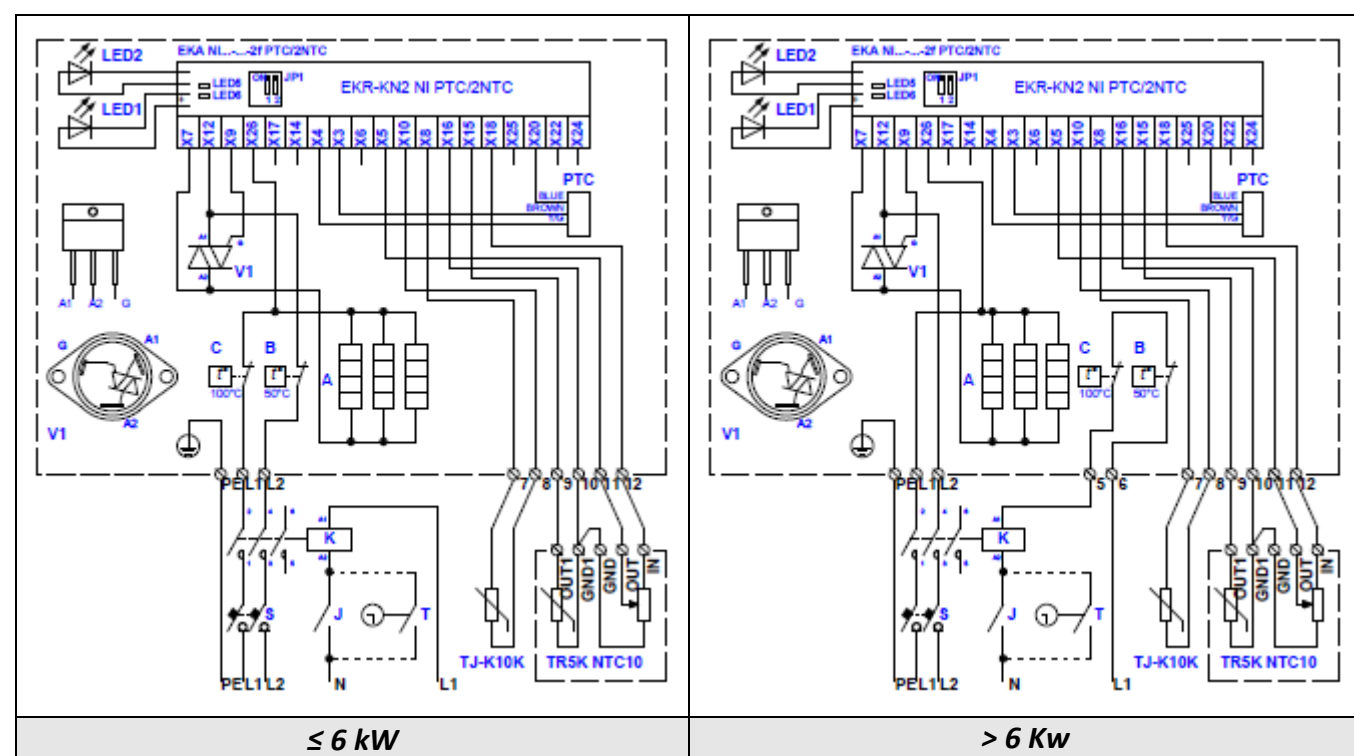


Fig. 65. Electrical wiring diagrams of 2-phase 400V heater EKA NI....-2f PTC/2NTC

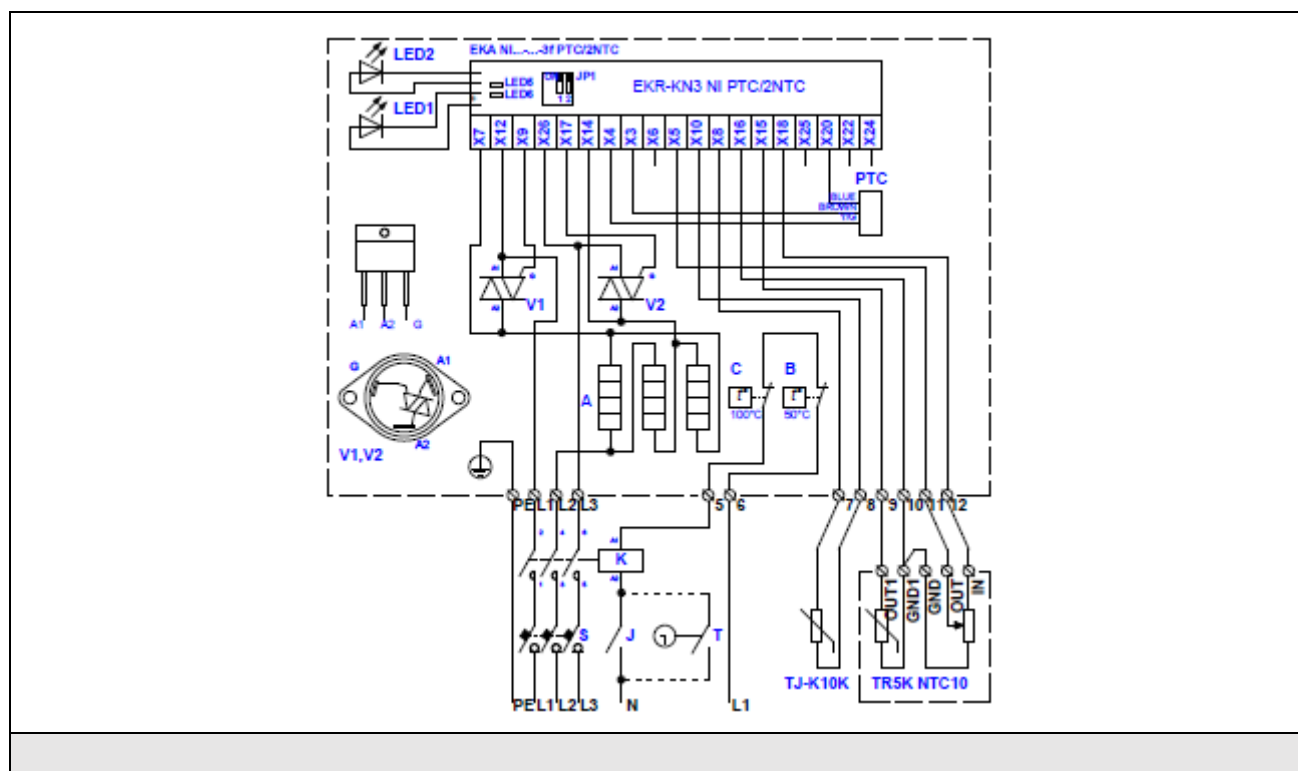


Fig. 66. Electrical wiring diagram of 3-phase 400V heater EKA NI...-3f PTC/2NTC

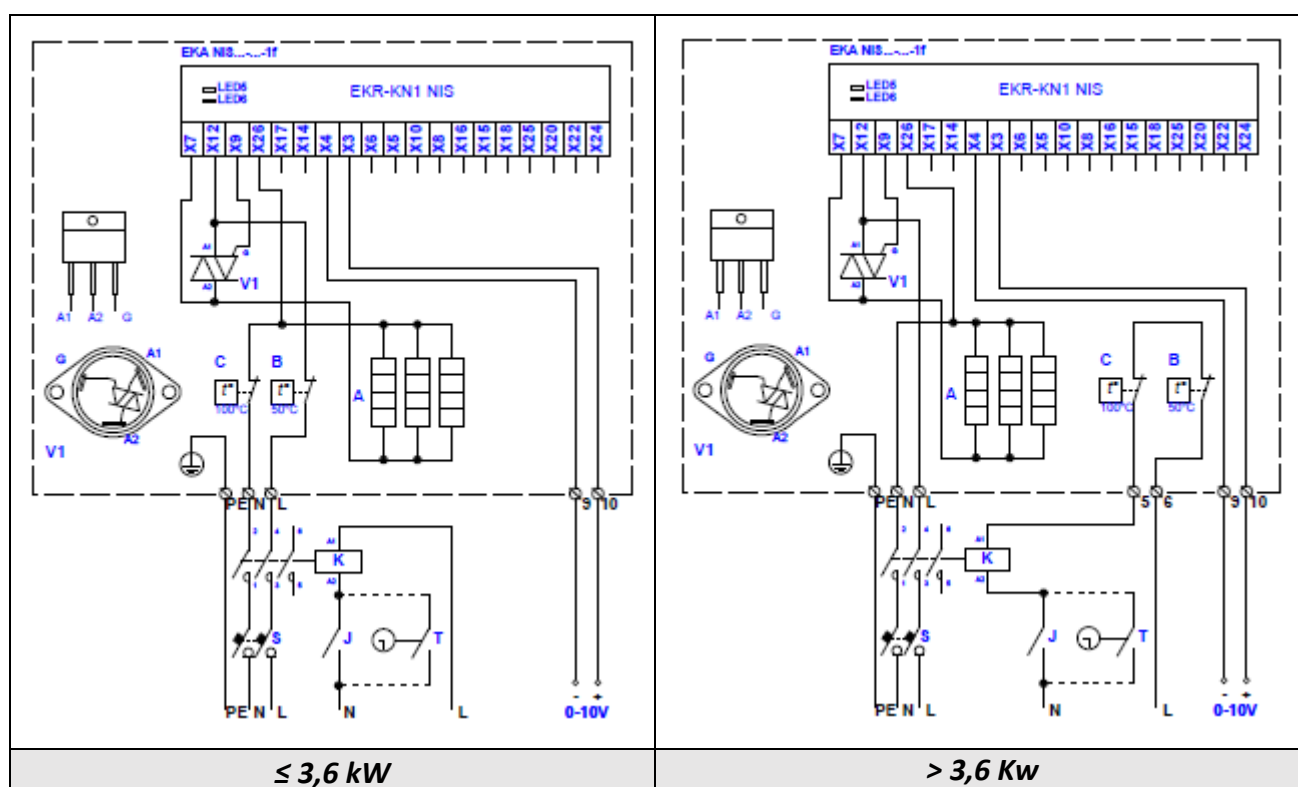


Fig. 67. Electrical wiring diagrams of single phase 230V heater EKA NIS...-1f

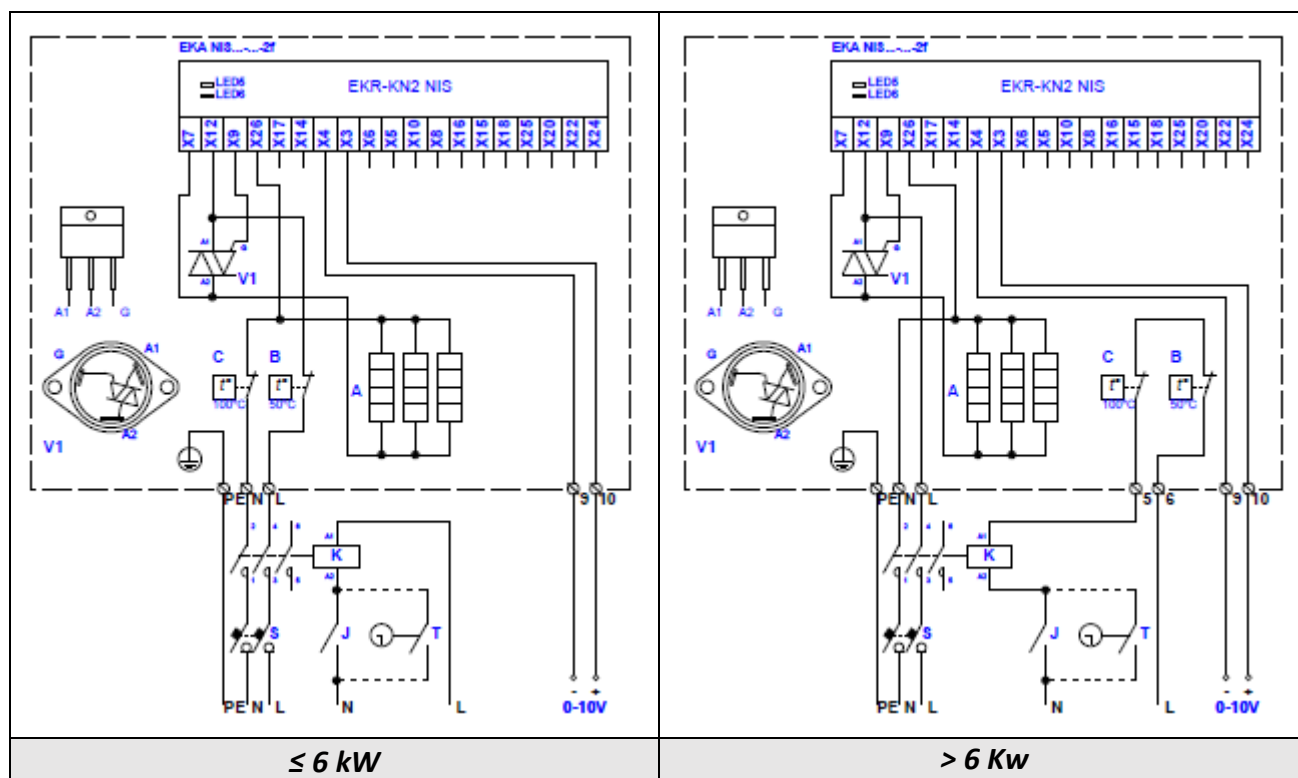


Fig. 68. Electrical wiring diagrams of 2-phase 400V heater EKA NIS...-2f

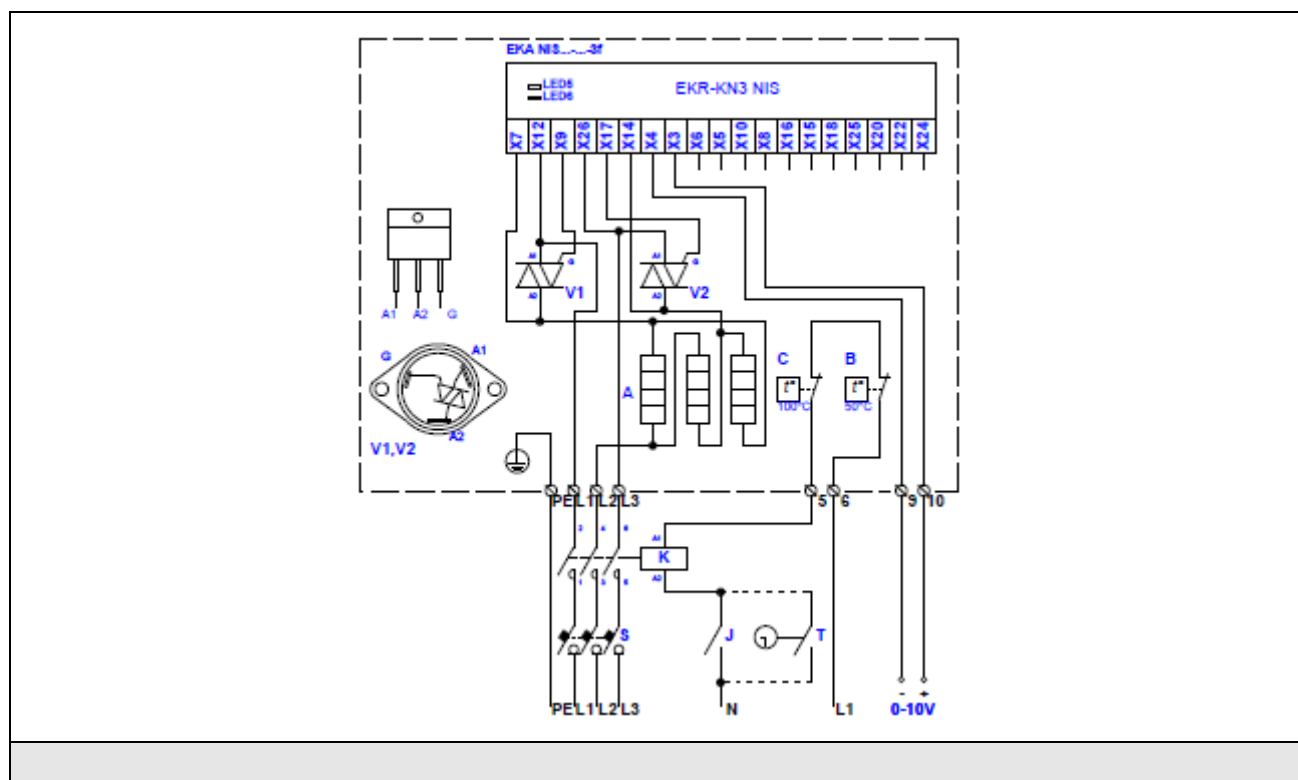


Fig. 69. Electrical wiring diagram of 3-phase 400V heater EKA NIS...-3f

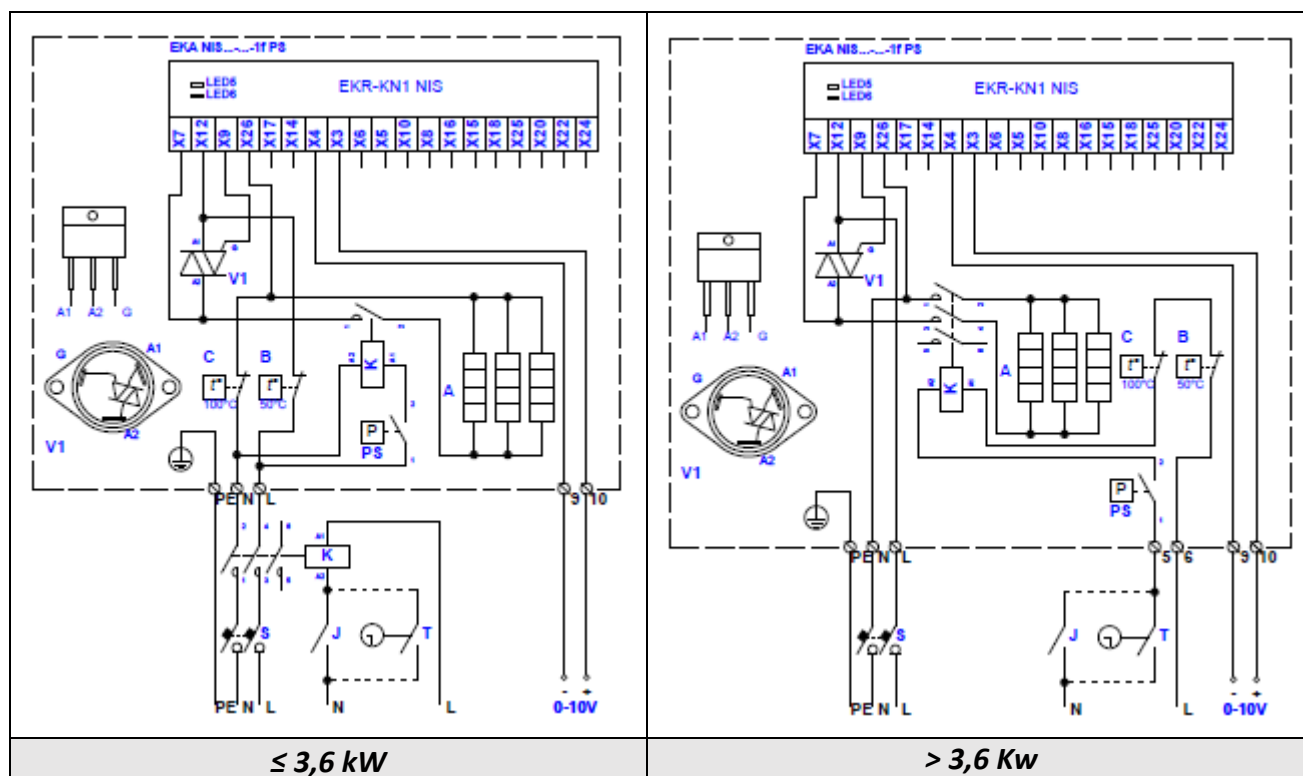


Fig. 70. Electrical wiring diagrams of single phase 230V heater EKA NIS...-1f PS

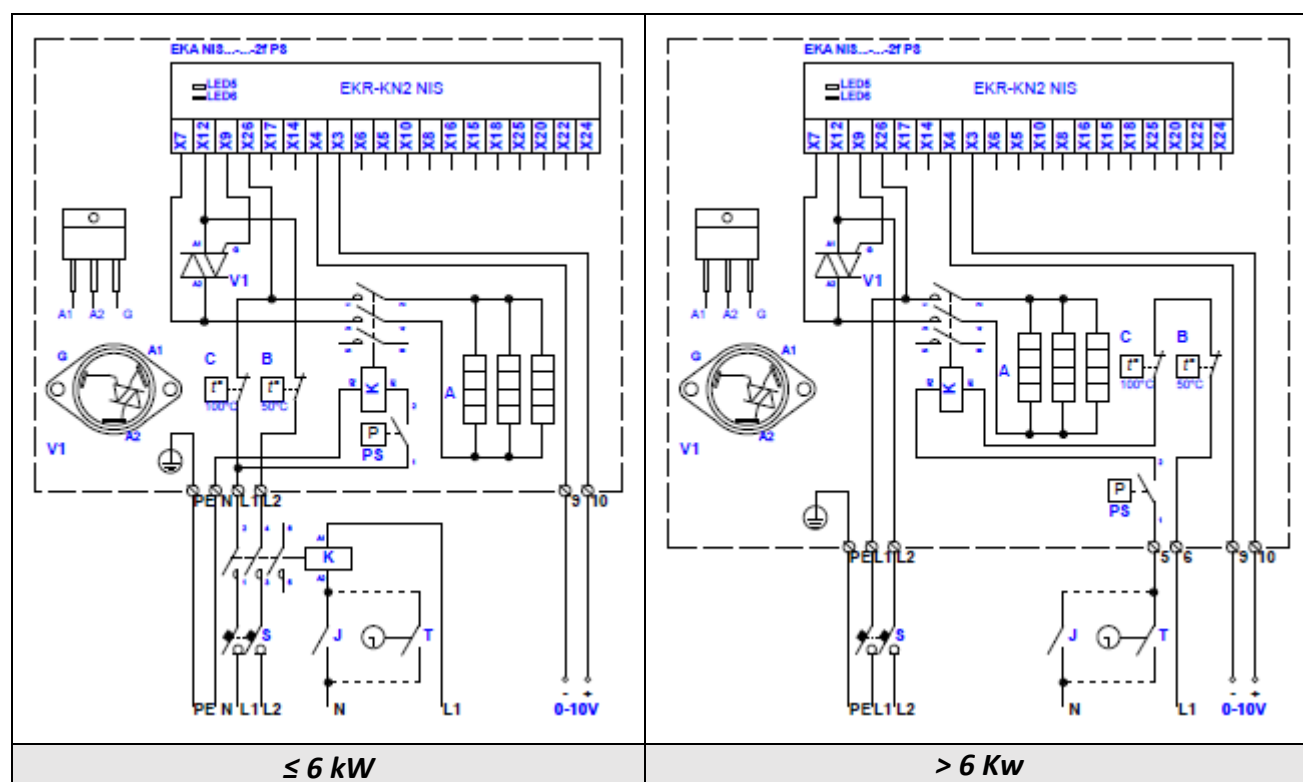


Fig. 71. Electrical wiring diagrams of 2-phase 400V heater EKA NIS...-2f PS

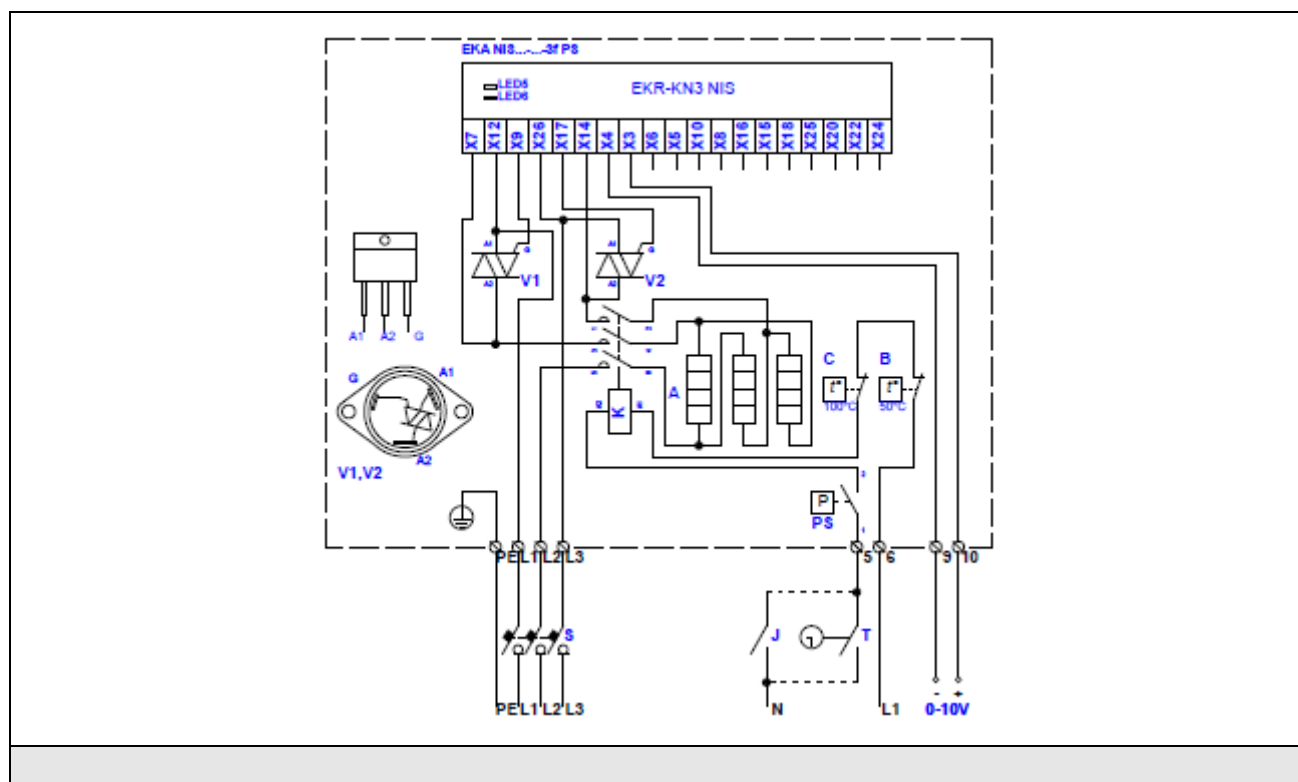


Fig. 72. Electrical wiring diagram of 3-phase 400V heater EKA NIS...-3f PS

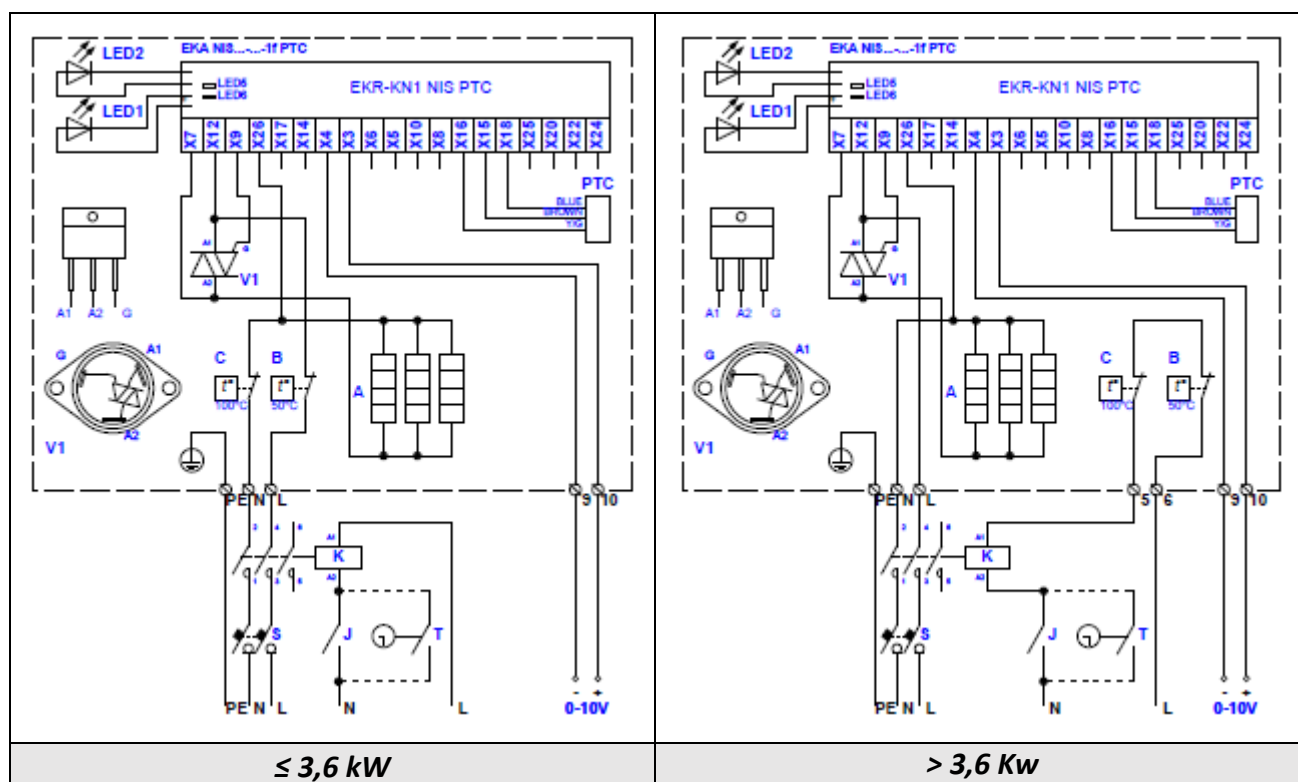


Fig. 73. Electrical wiring diagrams of single phase 230V heater EKA NIS...-1f PTC

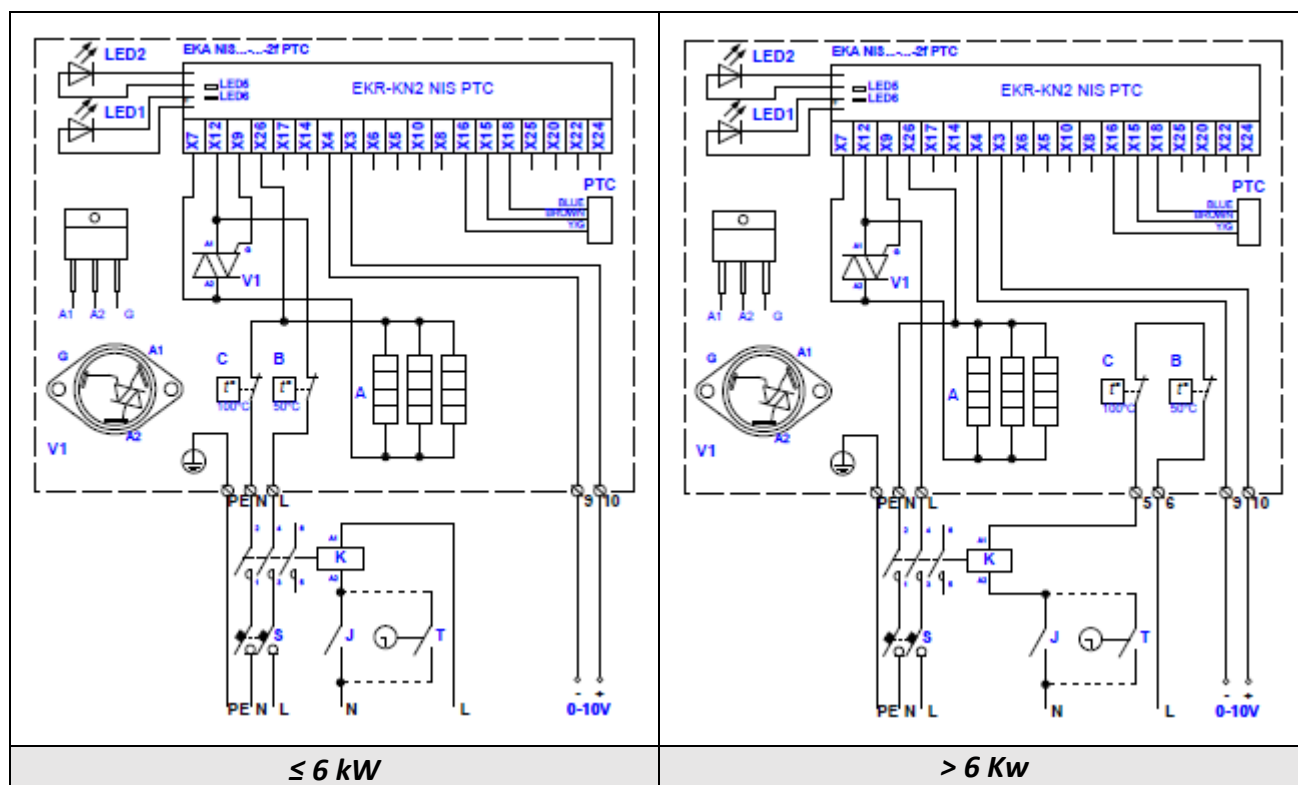


Fig. 74. Electrical wiring diagrams of 2-phase 400V heater EKA NIS...-2f PTC

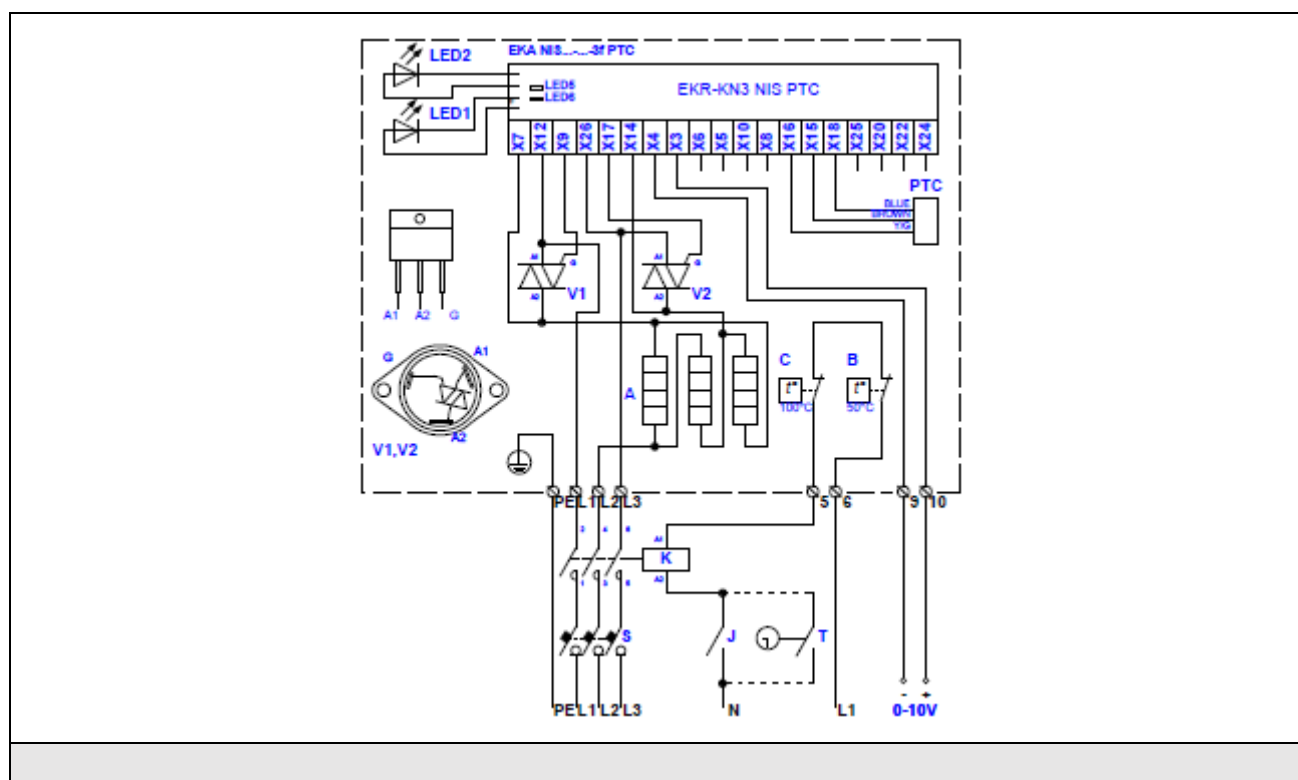


Fig. 75. Electrical wiring diagram of 3-phase 400V heater EKA NIS...-3f PTC

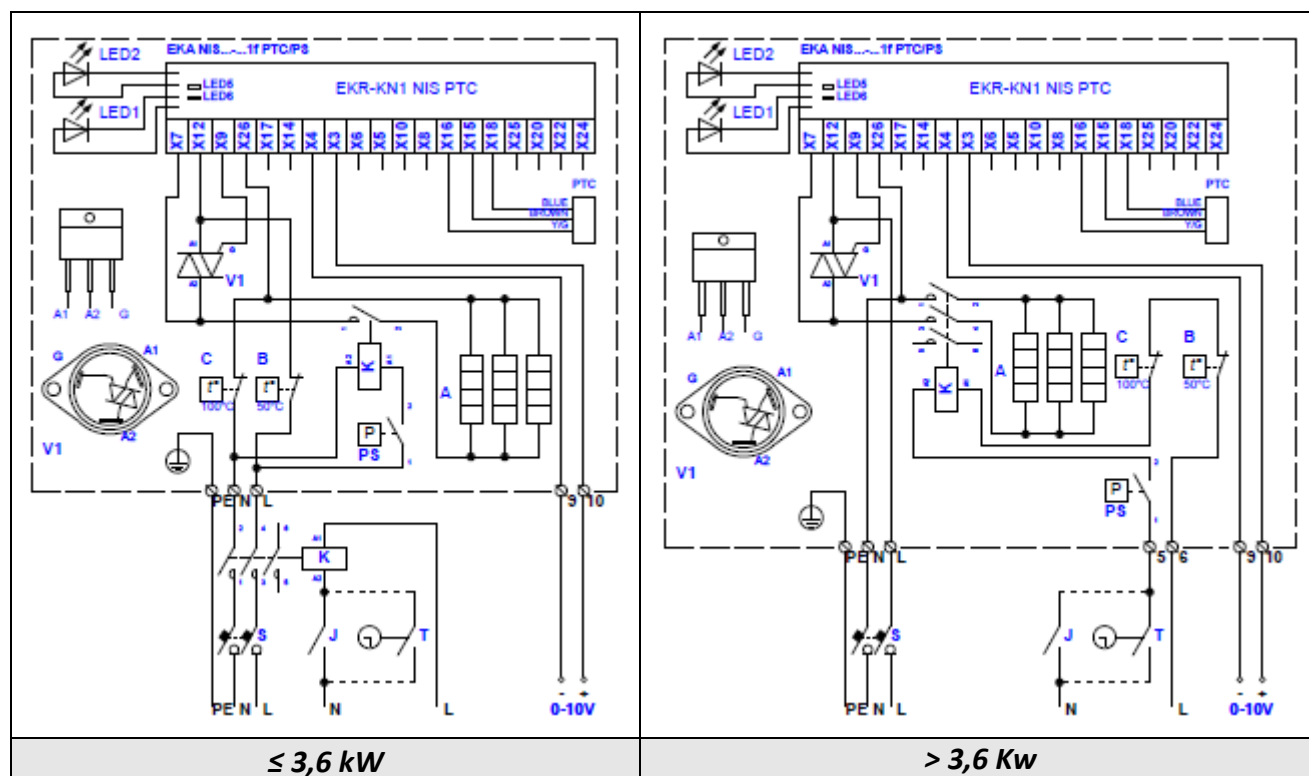


Fig. 76. Electrical wiring diagrams of single phase 230V heater EKA NIS...-1f PTC/PS

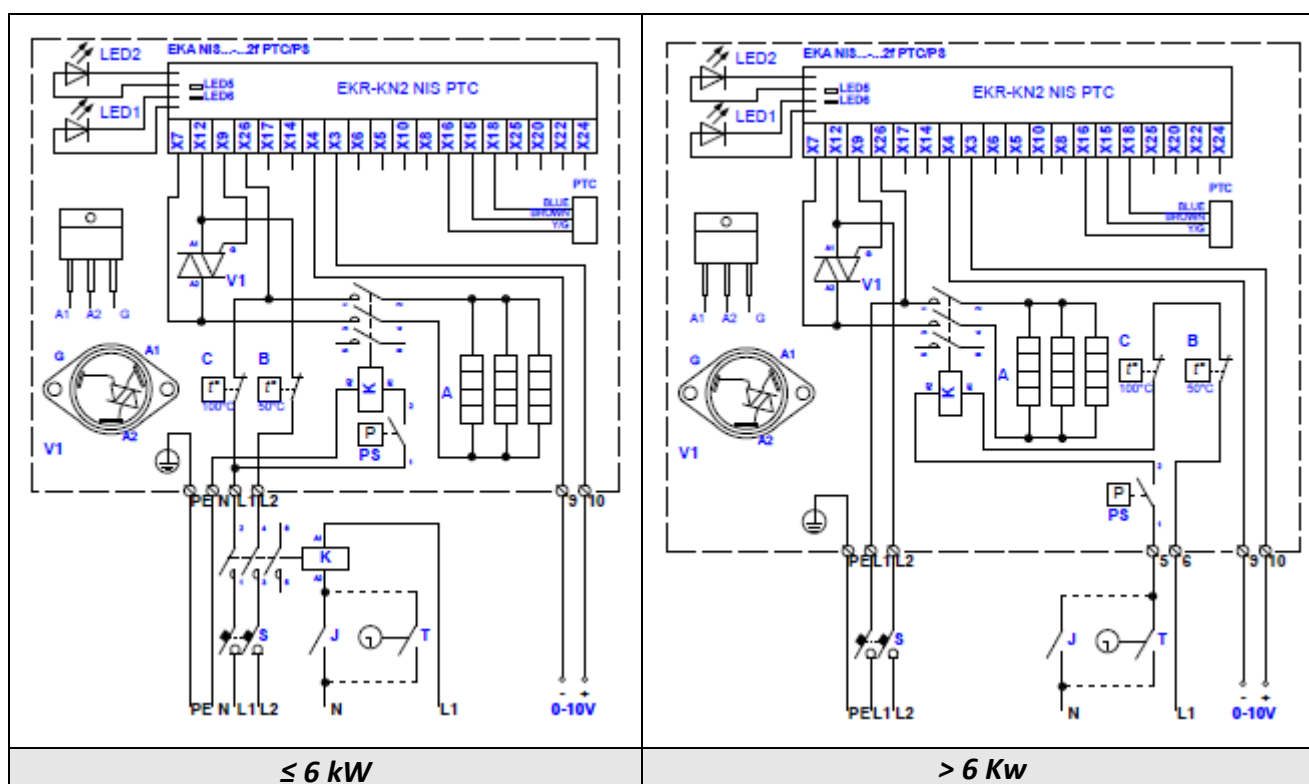


Fig. 77. Electrical wiring diagrams of 2-phase 400V heater EKA NIS...-2f PTC/PS

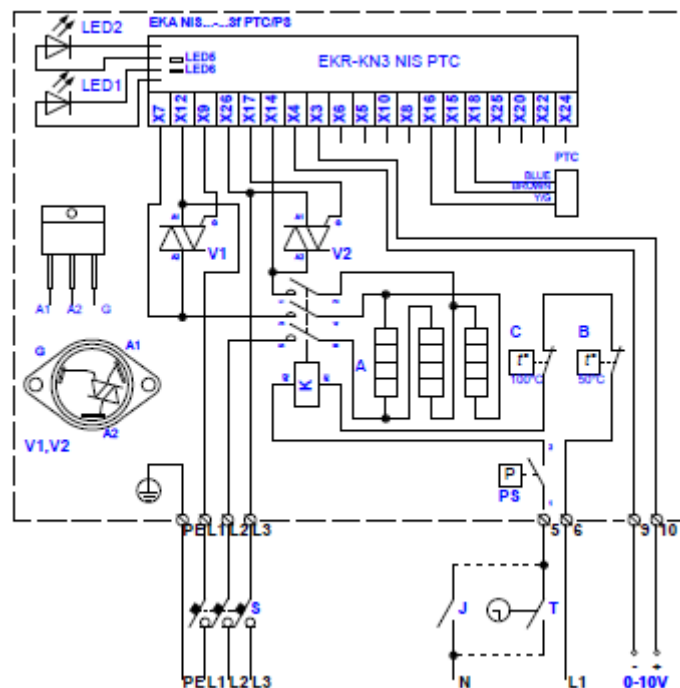


Fig. 78. Electrical wiring diagram of 3-phase 400V heater EKA NIS...-3f PTC/PS

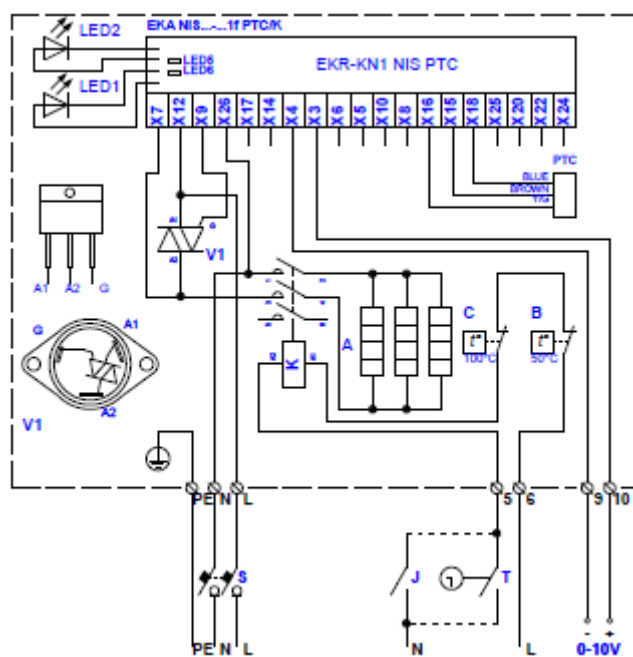


Fig. 79. Electrical wiring diagram of single phase 230V heater EKA NIS...-1f PTC/K

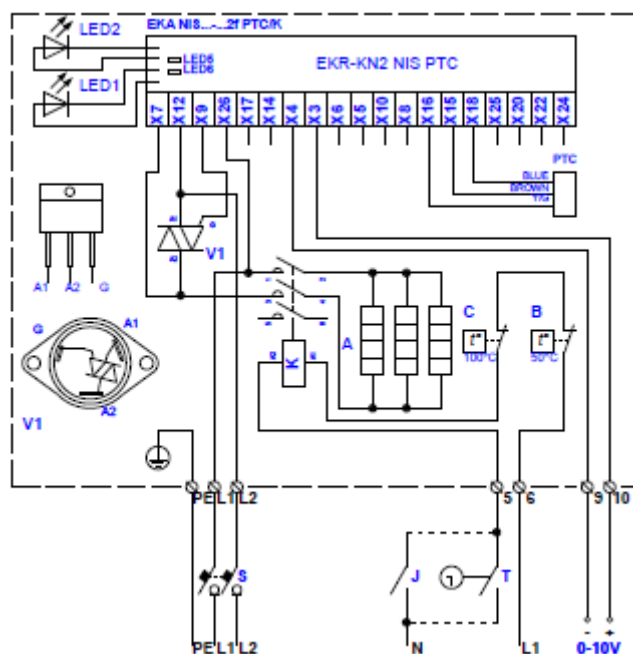


Fig. 80. Electrical wiring diagram of 2-phase 400V heater EKA NIS....-2f PTC/K

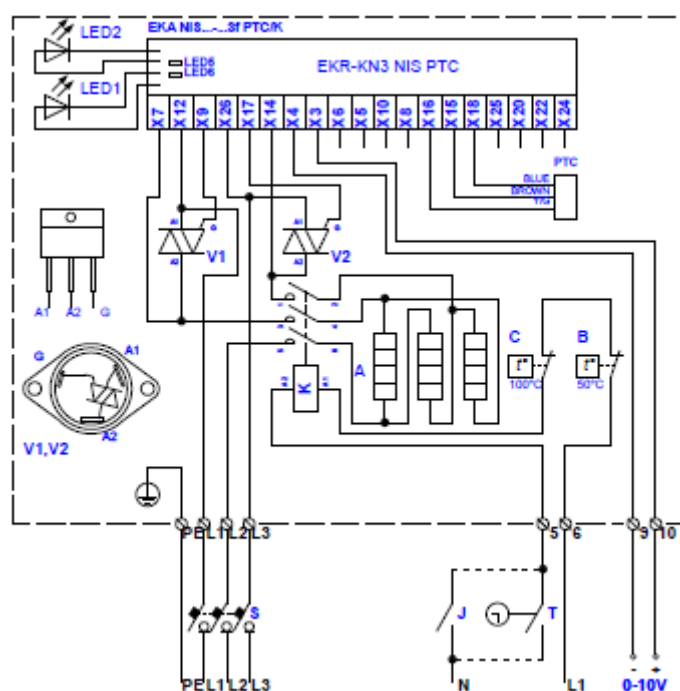
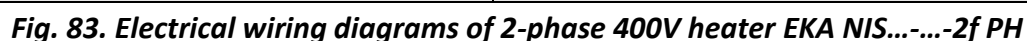
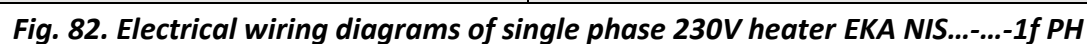


Fig. 81. Electrical wiring diagram of 3-phase 400V heater EKA NIS....-3f PTC/K



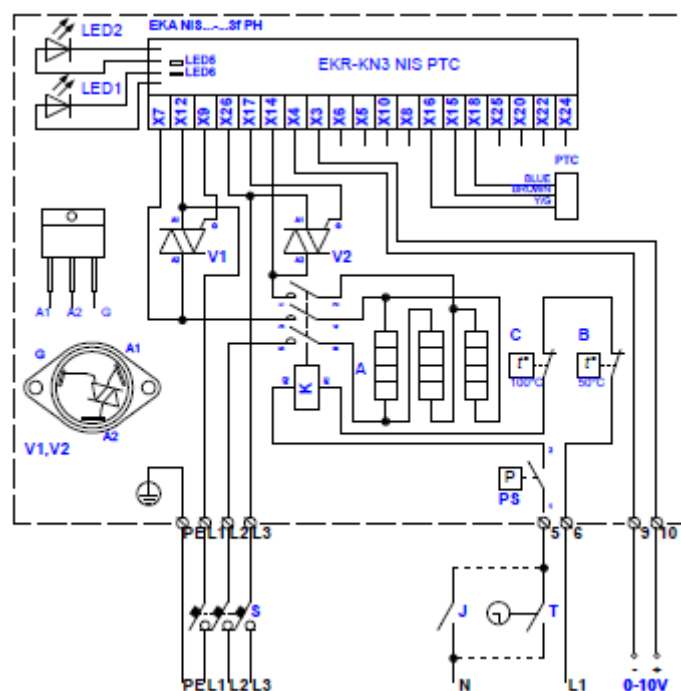
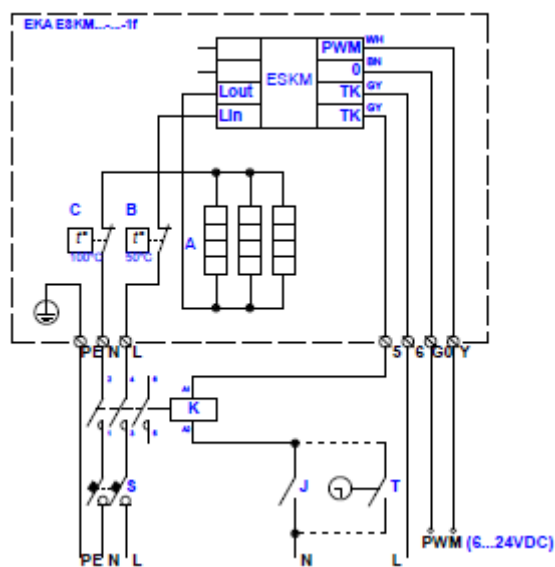
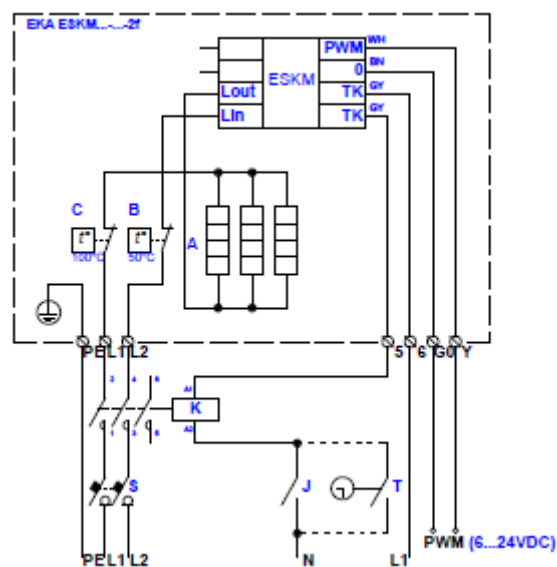


Fig. 84. Electrical wiring diagram of 3-phase 400V heater EKA NIS...-3f PH



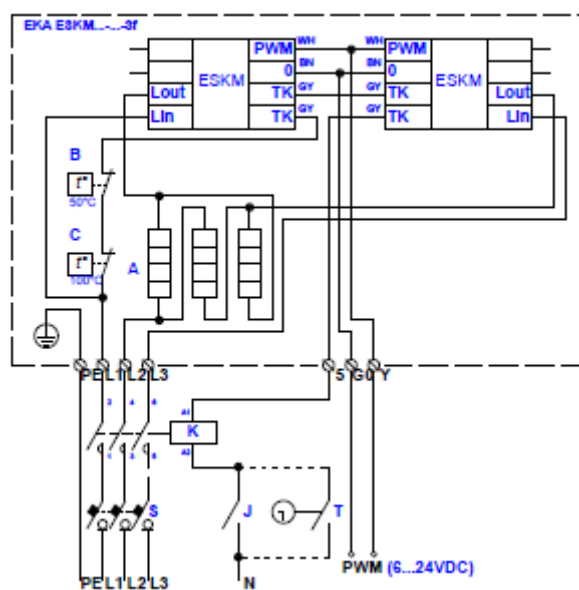
≤ 3 kW

Fig. 85. Electrical wiring diagram of single phase 230V heater EKA ESKM...-1f



$\leq 6 \text{ kW}$

Fig. 86. Electrical wiring diagram of 2-phase 400V heater EKA ESKM...-2f



$\leq 15 \text{ kW}$

Fig. 87. Electrical wiring diagram of 3-phase 400V heater EKA ESKM...-3f

Product warranty

Fill in this warranty information form and keep this page for future reference or when warranty service may be required.

Model name		EKA-.....f
Warranty period		
Date of invoice		
Customer info	Name (company)	
	Address	
	Contact info	
Retailer info	Name (company)	
	Address	
	Contact info	
Fault description		

The product warranty covers product malfunctions, under normal operating conditions for 24 months from the date of manufacturer's invoice. Please note that the product warranty terms may vary depending on purchase or installation contracts.

During the product warranty period, warranty service (free of charge) is provided for product malfunctions caused under normal operating conditions. For warranty service, contact an official "Ventmatika" dealer. Any manipulation of the appliance by personnel not appointed by "Ventmatika" will cancel the guarantee. "Ventmatika" reserves the right to modify the product without prior notice.

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal black lines across the entire width of the page, typical of notebook or legal stationery. There are no margins, text, or other markings present.