

# RECTANGULAR ELECTRIC DUCT HEATER

NHON TYPE





### Composition type designation:

**N - H - O - N - H - O - O**

**N** Position 1: **Product group**

N = air volume control terminals accessories

**H** Position 2: **Function**

H = suited for electric heating

**O** Position 3: **Controls (manufacturer)**

O = standard  
1 = non standard

**N** Position 4: **Outlet**

N = rectangular in- and outlet

**H** Position 5: **Reheat coil**

E = 230 V AC / 1 ph 1-stage type (on/off control) to 6kW  
 H = 400 V AC / 3 ph 1-stage (on/off control) to 18kW  
 J = 400 V AC / 3 ph 2-stage (on/off control) to 30kW  
 K = 400 V AC / 3 ph 3-stage (on/off control) on request  
 L = 400 V AC / 3 ph 4-stage (on/off control) on request  
 T = 230 V AC 1 ph with 0-10 V control (modulating control) (thyristor) to 6kW  
 V = 400 V AC / 3 ph with 0-10V control (modulating control) (Thyristor)

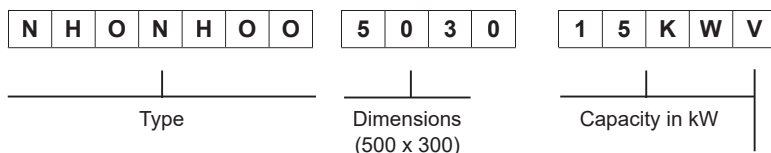
**O** Position 6: **Controls explanation**

O = no addition  
 P = differential pressure switch  
 K = internal contactor (only in combination with the 0 ... 10V control)

**O** Position 7: **Sensor**

O = not applicable

**Ordering example:**



Add.

**Ordering information:**

*Standard terminals:*

- quantity of terminals
- complete 7 digit code
- terminal size or model

*Non standard terminals:*

- for non standard terminals a full description and/or drawing are requested

## Type NHON...



## Application

- Electric heaters are designed to heat treated air in ventilation systems.

## Technical information

### Properties:

- Suited for 230V and 400V.
- Minimum air velocity >1,7 m/s.
- Max. output air temperature: 50 °C.
- Suited for on/off or modulating (0-10 V) control.

### Finish:

- Casing is made from aluzinc coated steel which is high temperature proof.
- Heating elements tube is made from stainless steel AISI 304.
- Minimum air velocity > 1,7 m/s.
- All NHON.OO duct heaters have two-stage overheat protection: the first stage switches on when the temperature reaches 50°C (resets automatically), the second stage switches on when the temperature reaches 100°C (is reset manually with pushbutton on the casing). The duct heaters have no internal temperature controller. External heating controllers are used in this case.
- In- and outlet equipped with 35 mm flange.
- Heaters can be installed vertically or horizontally.

## Regular type

- NHONHOO: rectangular electric duct heater, 1 stage 400 V, suited for on/off control.
- NHONJOO: rectangular electric duct heater, 2 stage 400 V, suited for on/off control.
- NHONVOO: rectangular electric duct heater, 400 V, suited for 0-10V modulating control.

The table on the next page shows which models and which capacities are standard available.

## Specifications

### Example:

The Barcol Air rectangular electric duct heaters are equipped with AISI 304 stainless steel heating elements and equipped with thermal clixons 50 °C (auto reset) and 100 °C (manual reset). The heater is supplied as one piece completely fitted and wired. Both sides outfitted with 35mm flange.

Barcol-Air type  
NHONHOO-4020-6KW

Dimensions:	400 x 200 mm
Power:	400 V/3 ph
No. of stages:	1
Electric capacity:	6kW, suited for on/off control

## Controls

### Control O - No addition

In this version no additional control is provided in the unit. Additional components and/or controls may be required for proper operation. See the corresponding connection diagram for the desired configuration for this.

### Control P - Differential Pressure Switch

In this version, the electrical reheating battery is provided with a differential pressure switch. The differential pressure switch is intended for detecting the air pressure / minimum air volume before the heater is in operation. The differential pressure switch is internally connected to the same protection loop to which the thermal protection is also coupled.

### Control K - Relay

In this version, the electrical re-heater battery is equipped with a relay, which is intended for external enable/blocking control. In addition, the relay switches off the electric heater when the thermal protection is activated. The relay is internally connected to the same protection loop to which the thermal protection is also coupled.

### Available models and electric capacities 400V

Dimension [mm]	Capacity [kW]																			
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	60	66
400 x 200	▪	▪	▪	▪	▪	▪	▪													
500 x 250	▪	▪	▪	▪	▪	▪	▪	▪	▪	X	X	▪	X	X	▪					
500 x 300		▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪				
600 x 300		▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪				
600 x 350		▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪				

### Available models

Dimension [mm] B x H	L (installed length in mm)						
	t/m 12 kW: 370	15 t/m 18 kW: 420	21 kW: 520	24 kW: 600	27 kW: 670	36 kW: 820	45 kW: 970
400 x 200	t/m 12 kW: 370	15 t/m 18 kW: 420	21 kW: 520				
500 x 250	t/m 12 kW: 370	15 t/m 18 kW: 420	21 kW: 520	24 kW: 600	27 kW: 670	36 kW: 820	45 kW: 970
500 x 300	t/m 24 kW: 370	27 t/m 33 kW: 440	36 t/m 42 kW: 520	45 t/m 48 kW: 600	-	-	-
600 x 300	t/m 24 kW: 370	27 t/m 33 kW: 440	36 t/m 42 kW: 520	45 t/m 48 kW: 600	-	-	-
600 x 350	t/m 30 kW: 370	33 t/m 39 kW: 420	42 en 48 kW: 520				
700 x 400	t/m 48 kW: 370	51 en 54 kW: 420	57 t/m 66 kW: 440				
800 x 500	t/m 48 kW: 370	51 en 54 kW: 420	57 t/m 66 kW: 440				
1000 x 500	t/m 48 kW: 370	51 en 54 kW: 420	57 t/m 66 kW: 440				

### Example

Given:

Dimension: 400 x 200 mm  
 Air volume: 1600 m<sup>3</sup>/h  
 Entering air temperature: 15 °C  
 Desired leaving air temperature: 35 °C

Requested:

The capacity\* of the electric reheat coil and suited model.

(\* = heating capacity, not room capacity)

Result:

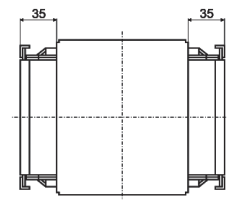
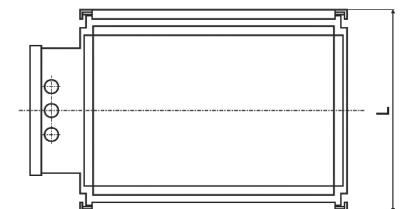
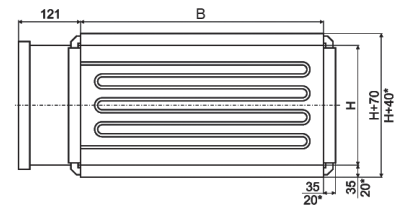
The required capacity can be calculated by using the below formula:

$$P = 0,335 * Q_v * \Delta T$$

P: required heater capacity (watt)  
 Q<sub>v</sub>: air volume [m<sup>3</sup>/h]  
 ΔT: difference in air temp. (LTA-ETA) [K]

$$P = 0,335 * 1600 * (35-15) = 10.720 \text{ Watt}$$

Rectangular electric duct heaters with the dimension 400 x 200 mm are available with capacities of 3, 6, 9, 12, 15, 18 and 21 kW. In this case the 12 kW will be sufficient.



Notes:  
 1. Dimensions in millimeters.

**Fig. 1. Installation and electrical connection**

Fig. 1. Installation and electrical connection Electrical duct heaters NHON can be installed horizontally in any position except with the electrical connection box downward. Vertically only if the air flow direction is upwards (see Fig. 1).

**Heaters installation positions**

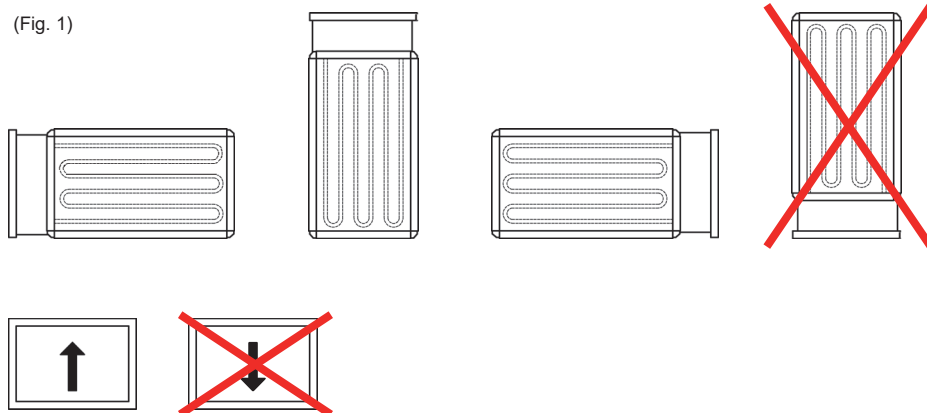
Heaters can't be installed in explosive and aggressive substances environment. Heaters can be used only for clean air heating or preheating. Heaters intended only for indoor installation. If the heater is installed in such way that accidental contact with the heating elements is possible a protective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

**Important**

The installation to the main power supply may only be wired by a competent electrician. The power supply cable must be selected in the ratio with the power of the heater. When installing these heaters, the standards and regulations in your country must be strictly followed. When installing this product ensure the power source is adequately protected by means of a suitably-rated fuse or automatic circuit breaker (not included), to enable the installer to cut all power.

Automatic circuit breaker must be selected in compliance with the power and nominal current (see the electrical rating label on the heater casing) of the heater and should have characteristic B. Connect the heater to the main power supply, check that the voltage, frequency, power and current are the same as those indicated on the electrical rating label. The heater must have earth connection.

(Fig. 1)

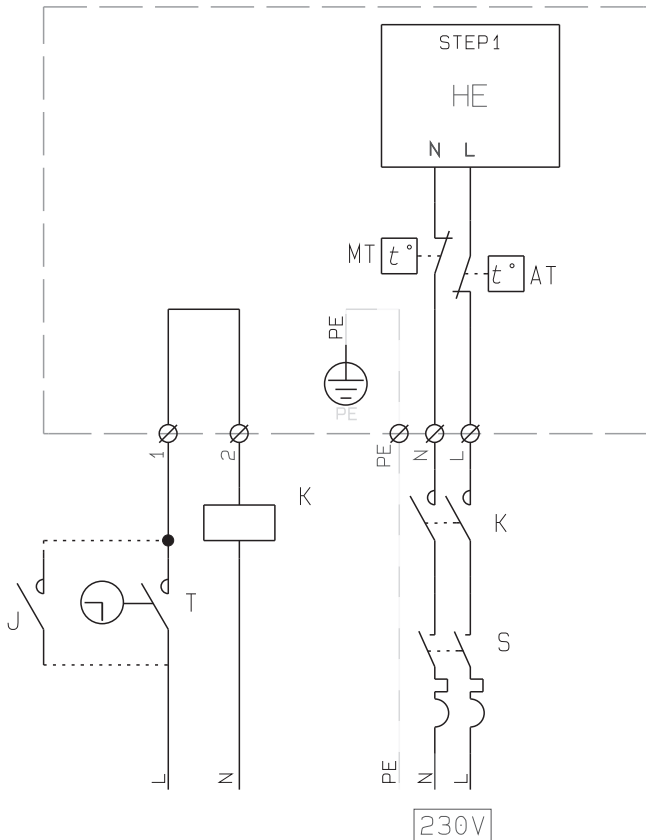


**N H - O - N - E - O - O**

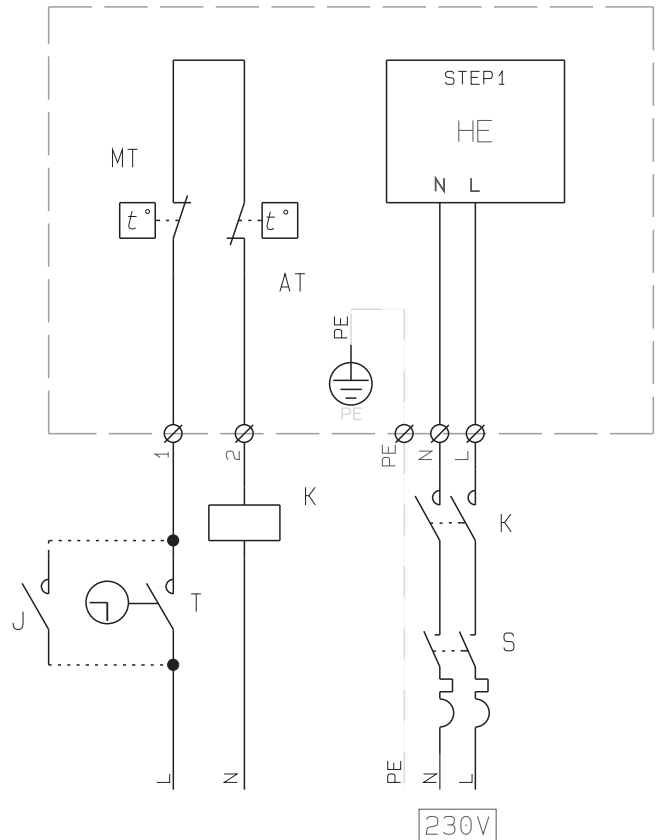
(230Vac - On/Off)

≤ 3,6kW

> 3,6kW



MT - Thermostat with manual reset  
 AT - Thermostat with automatic reset  
 HE1-HE3 - Heating elements  
 K - User side contactor  
 S - User side circuit breaker  
 T, J - User control switches



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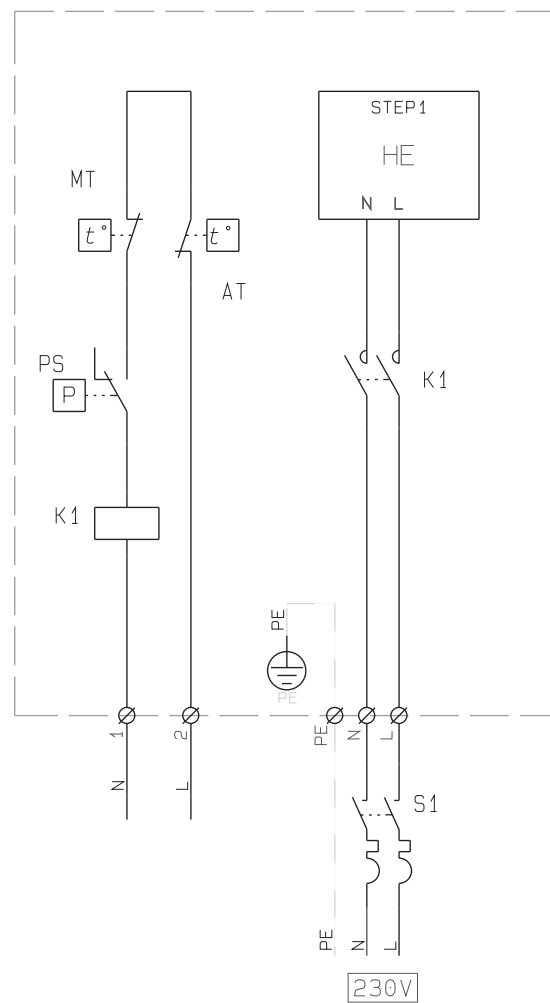
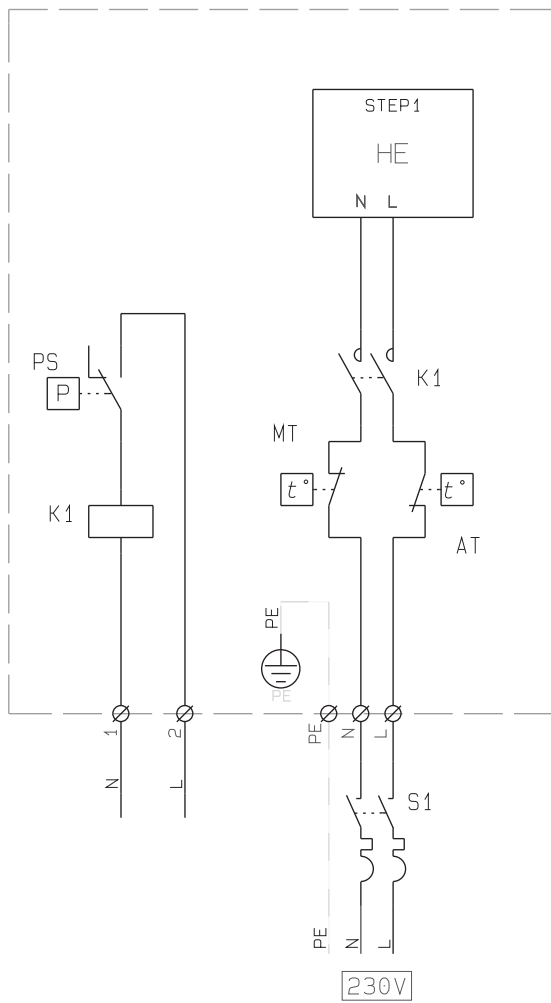
Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.

**N - H - O - N - E - P - O**

(230Vac - On/Off - incl. differential pressure switch)

≤ 3,6kW

> 3,6kW



MT - Thermostat with manual reset  
 AT - Thermostat with automatic reset  
 HE - Heating elements  
 K1 - Internal Contactor/Relay  
 S - User side circuit breaker  
 PS - Differential pressure switch

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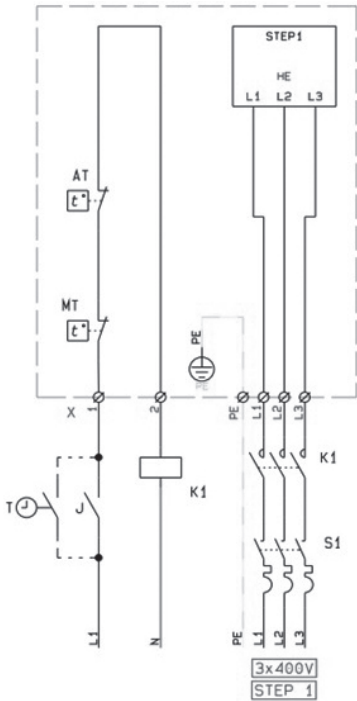
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**N - H - O - N - H - O - O**

(400Vac - On/Off - 1-step)

≤ 15kW

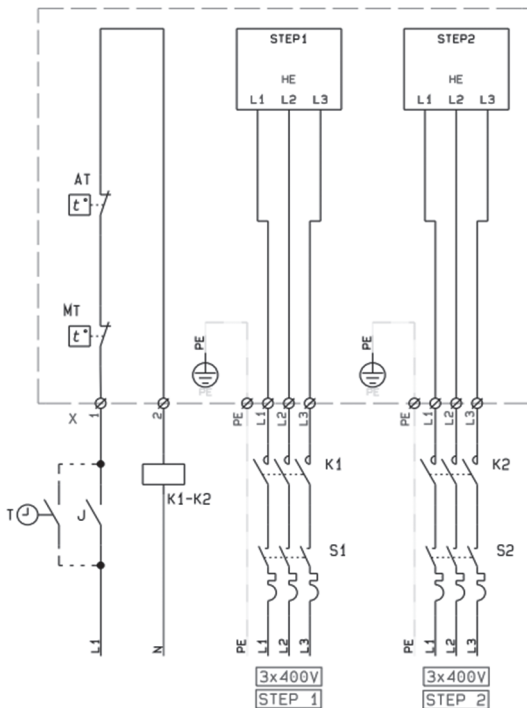


- MT - Thermostat with manual reset
- AT - Thermostat with automatic reset
- HE - Heating elements
- K1 - User side Overheat protection contactor
- S1 - User side circuit breakers
- T, J - User Control switches

**N - H - O - N - J - O - O**

(400Vac - On/Off - 2-step)

Power from 21kW to 30kW



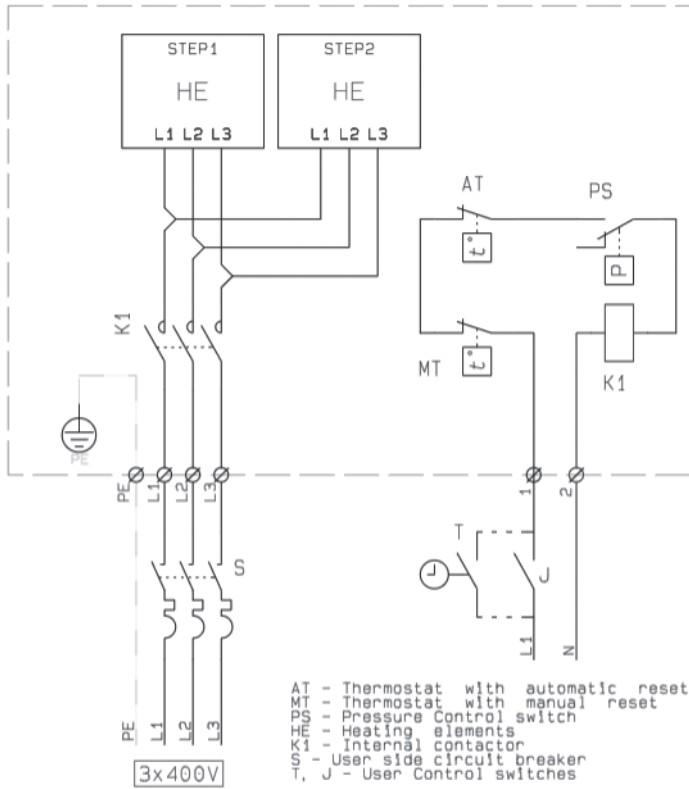
- MT - Thermostat with manual reset
- AT - Thermostat with automatic reset
- HE - Heating elements
- K1-K2 - User side Overheat protection contactor
- S1-S2 - User side circuit breakers
- T, J - User Control switches

Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.

**N - H - O - N - H - P - O**

(400Vac - On/Off - 1-step - incl. differential pressure switch)

≤ 18kW

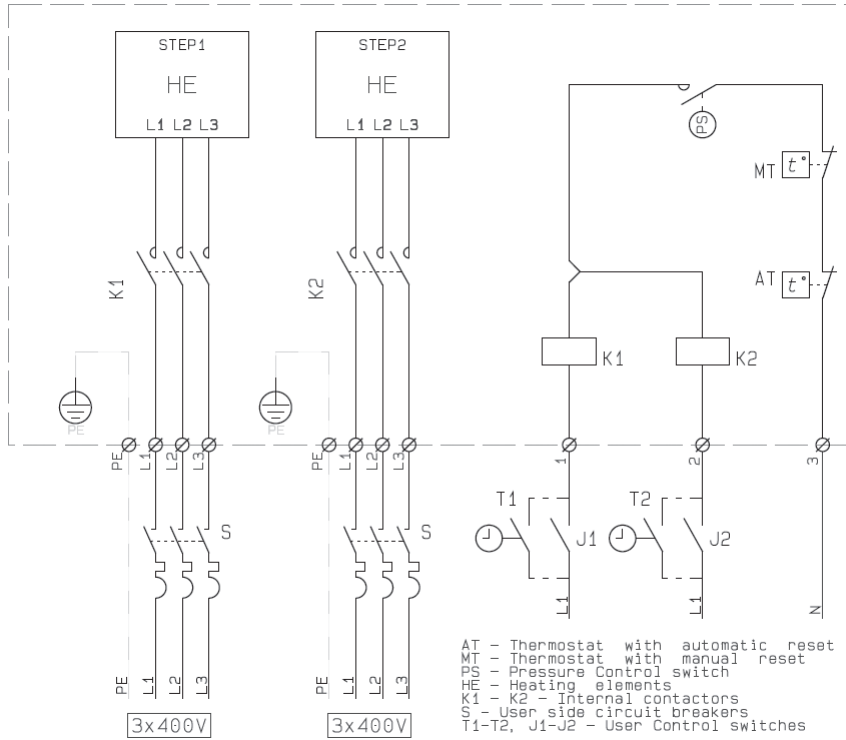


Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.

**N - H - O - N - J - P - O**

(400Vac - On/Off - 2-step - incl. differential pressure switch)

Power from 21kW to 30kW

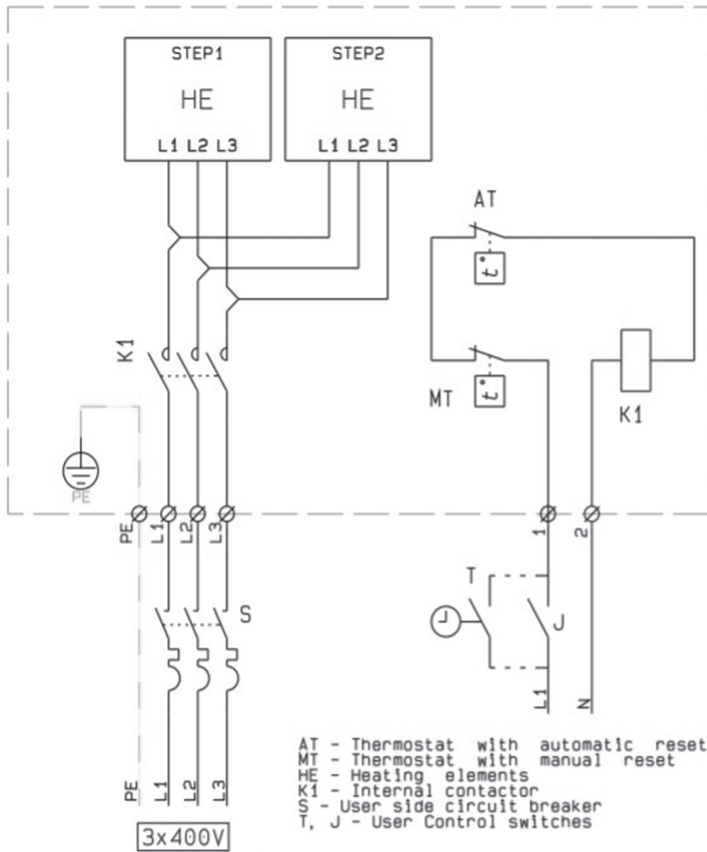


Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.

**N - H - O - N - H - K - O**

(400Vac - On/Off - 1-step - incl. internal contactor)

≤ 18kW

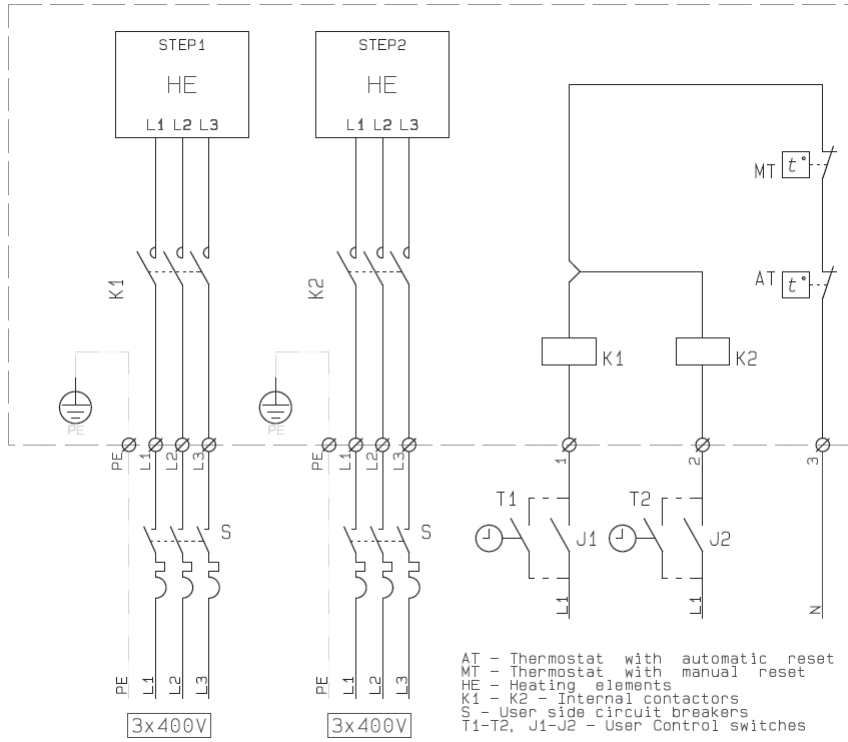


Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.

**N - H - O - N - J - K - O**

(400Vac - On/Off - 2-step - incl. internal contactor)

**Power from 21kW to 30kW**

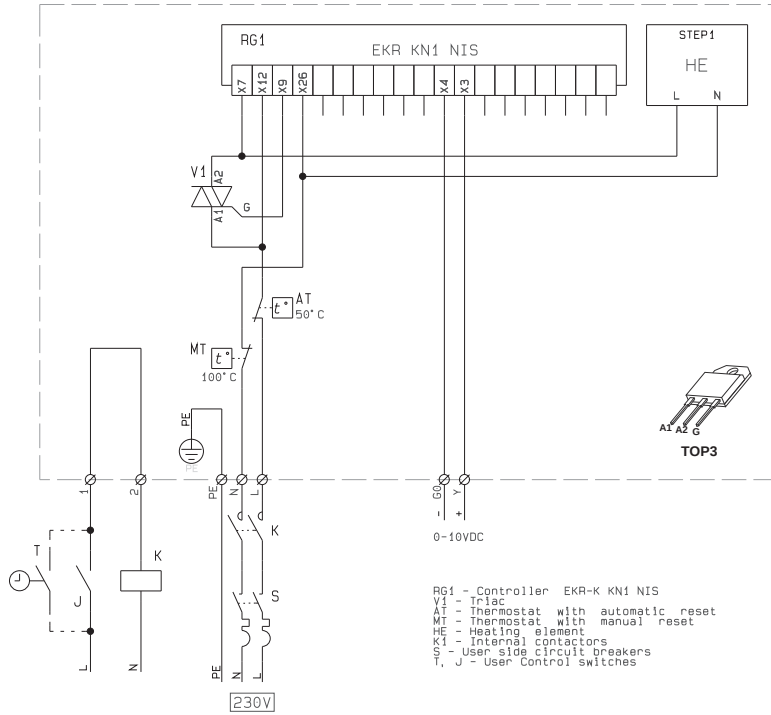


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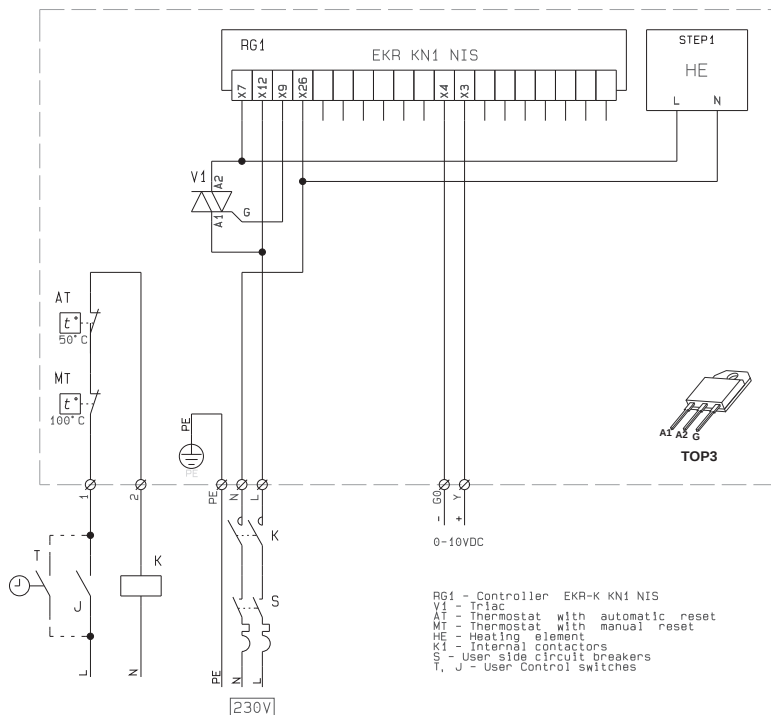
# N - H - O - N - T - O - O

(230Vac - 0..10V control)

≤ 3,6kW



> 4kW



Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.

# Rectangular electric duct heater

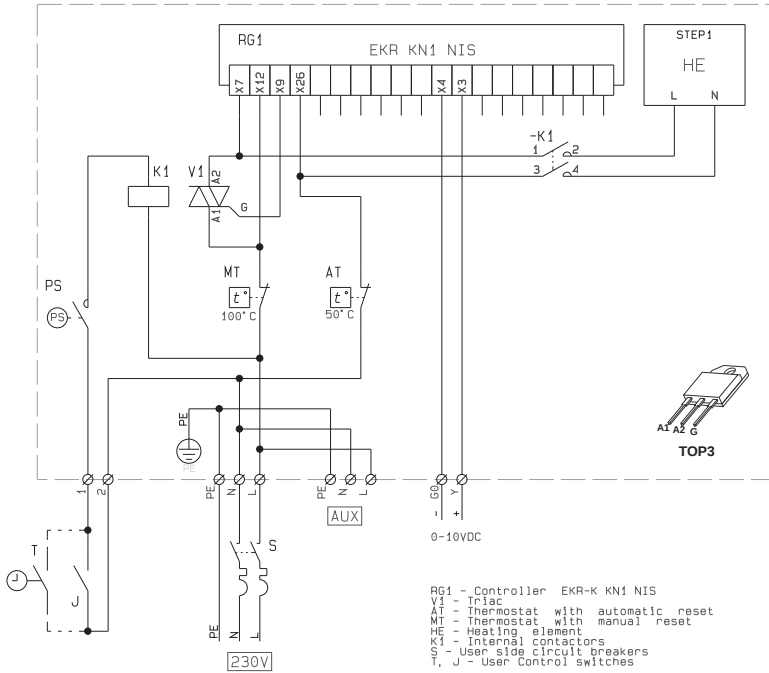
## Wiring diagram

Type NHON

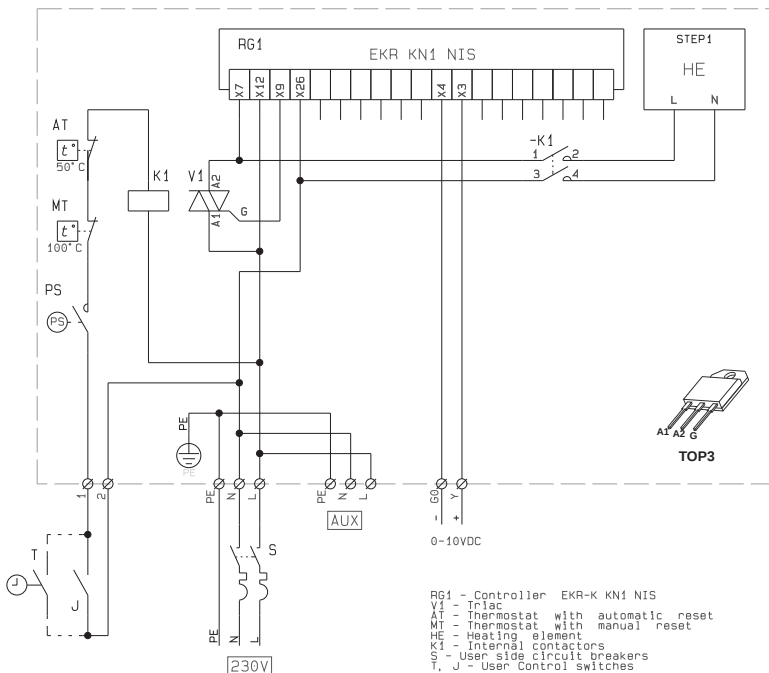
**N - H - O - P - T - P - O**

(230Vac - 0..10V control incl. differential pressure switch)

≤ 3,6kW



> 4kW

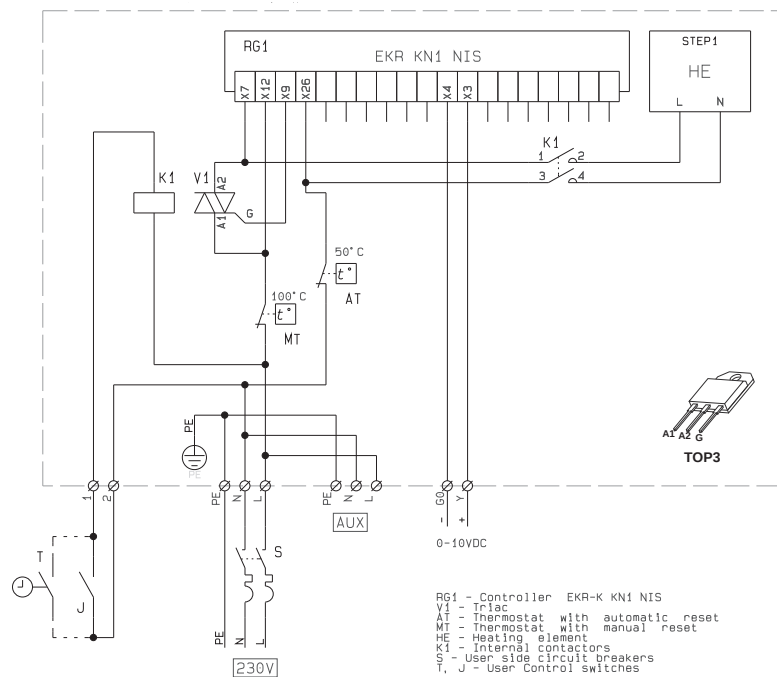


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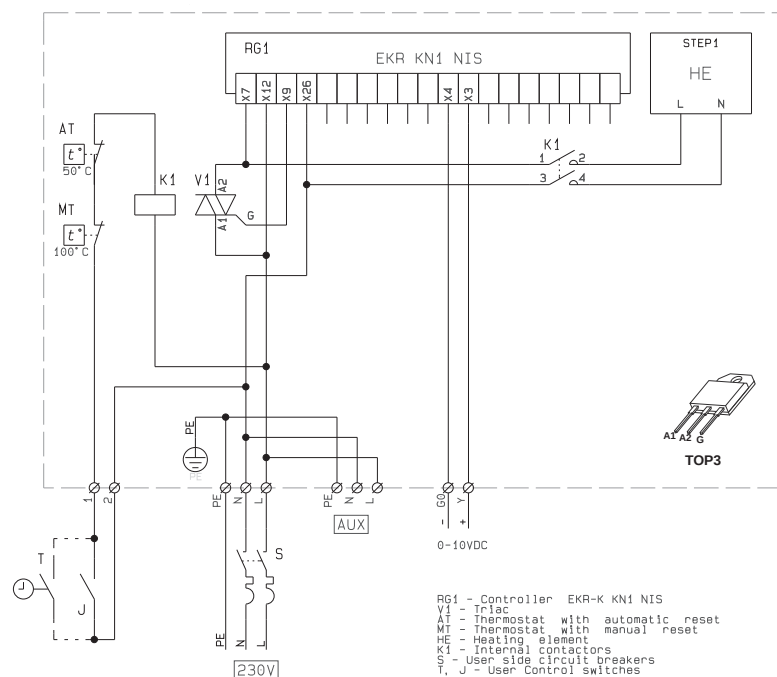
**N - H - O - N - T - K - O**

(230Vac - 0..10V control incl. internal contactor)

≤ 3,6kW



> 4kW

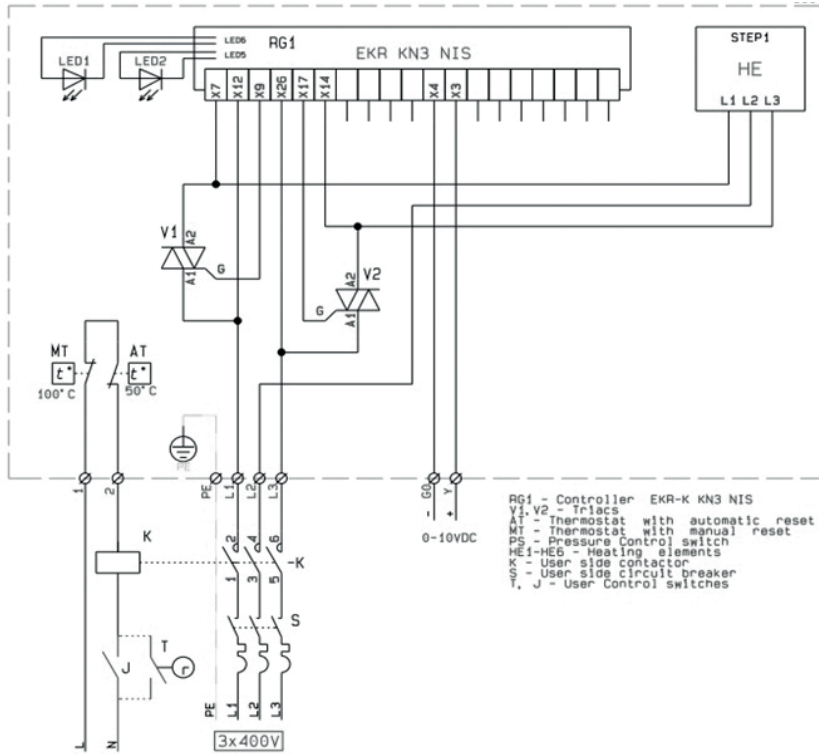


Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.



**N - H - O - N - V - O - O** (400Vac - 0..10V control)

≤ 15kW

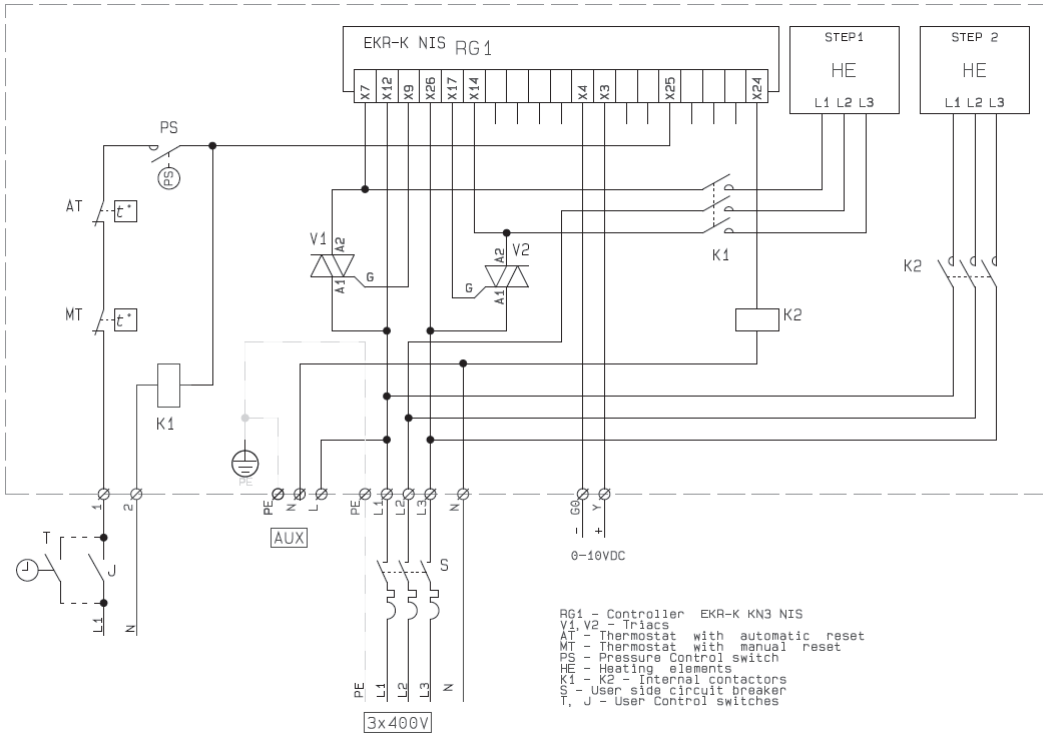


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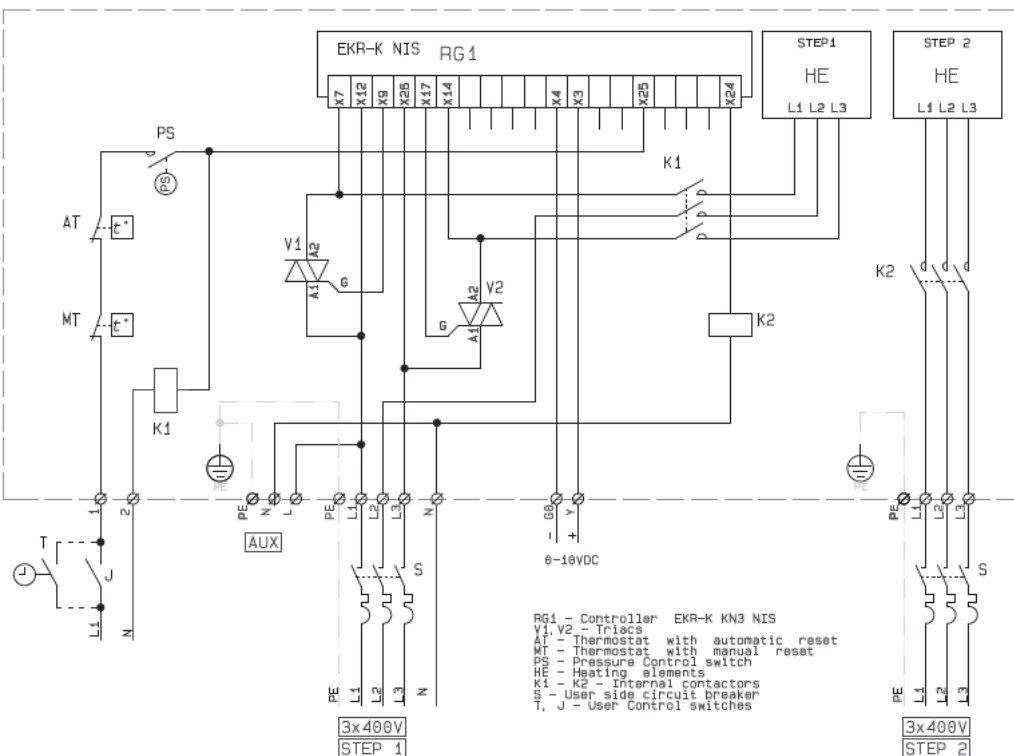
**N - H - O - N - V - P - O**

(400Vac - 0..10V control incl. differential pressure switch)

≤ 18kW



Power from 21kW to 30kW

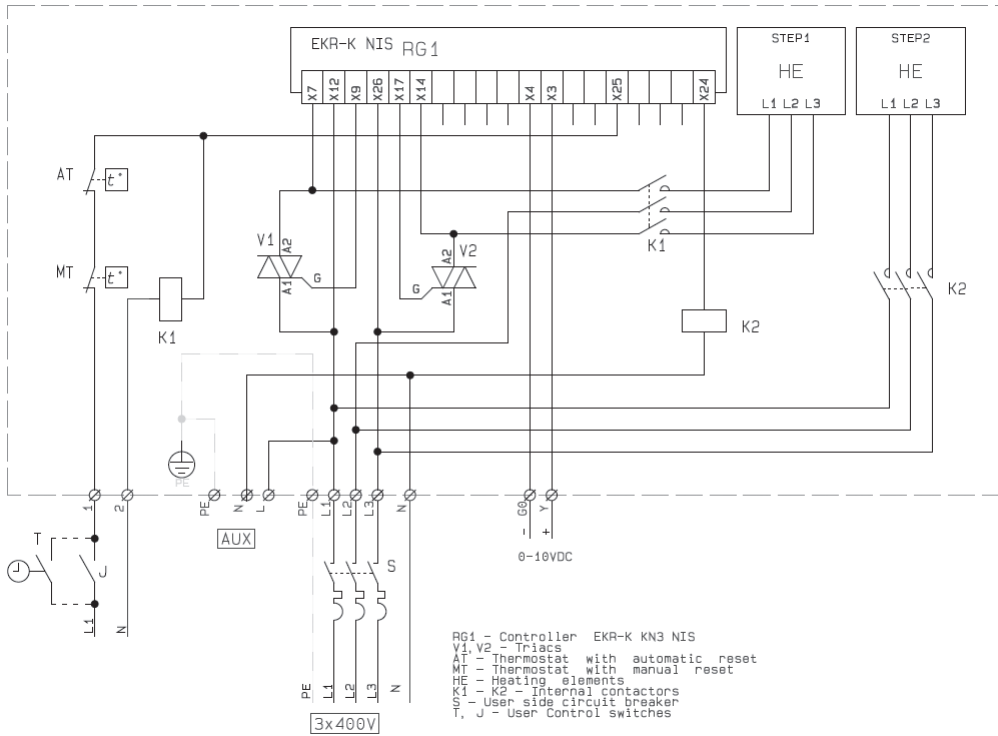


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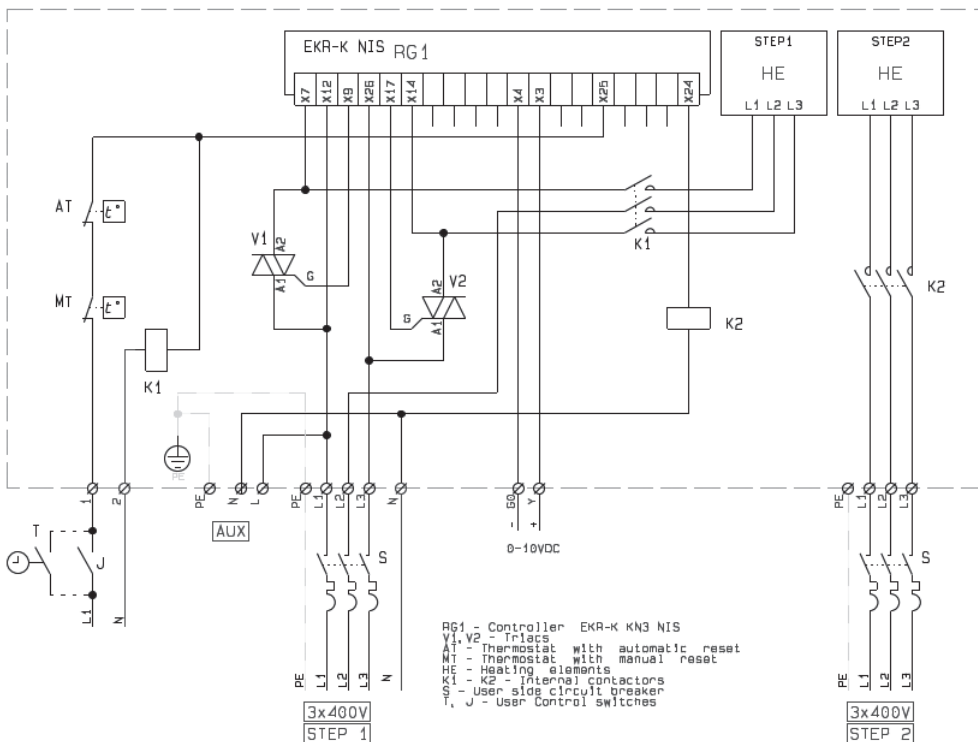
**N - H - O - N - V - K - O**

(400Vac - 0..10V control incl. internal contactor)

≤ 18kW



Power from 21kW to 30kW



Scope of delivery is within the dotted box, components outside the box are a minimum requirement for proper operation.



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