



FLEXIHEAT UK LTD

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Automation set KM EL LITE + LEO KM EL S|L + LEO EL S|L BMS

EN

TECHNICAL DOCUMENTATION
OPERATION MANUAL

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The manufacturer reserves the right to make revisions and changes in the operation manual at any time and without notice, and also to make changes in the device without influencing its operation. This manual is an integral part of the device and it must be delivered to the user together with the device. In order to ensure correct operation of the equipment, get thoroughly acquainted with this manual and keep it for the future.

1. GENERAL INFORMATION

KM S mixing chamber is dedicated to operate with LEO EL S BMS units. KM L mixing chamber is dedicated to operate with LEO EL L BMS units. It is designed for delivering fresh air to the room. Depending on the needs the air stream can be warmed up by a heat exchanger.

In a mixing chamber are three air inlets: two for recirculating air and one for external air. Dampers are regulated in range 0-100%.

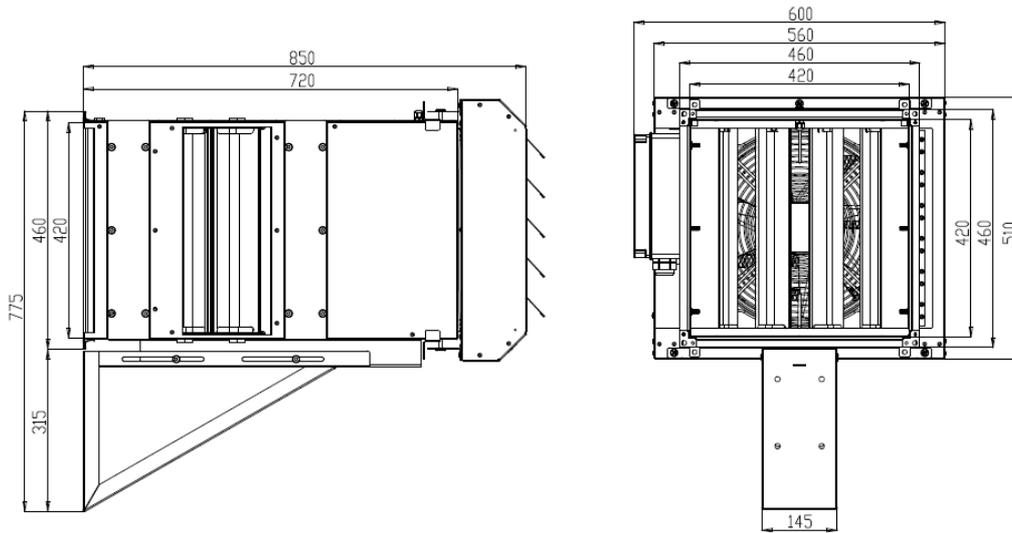
Mixing chamber is equipped with filter EU3 class (optional EU4 class).

The chamber is not thermally insulated. There is a risk of condensation in the mixing chamber. This is influenced by many factors, climatic conditions prevailing outside the building as well as inside it (air temperature and relative humidity), degree of mixing of the fresh air with recirculated air, quantity of fresh air. Decisions about the mixing chamber operation mode, and also whether and how the chamber should be thermally insulated, should be made by the designer, taking into account the factors listed above.

2. APPLICATION

LEO KM are designed to operate indoors. The chambers are made of aluminum and galvanized steel thus they can't be applied in the corrosive environment.

3. TECHNICAL DATA



	LEO EL S BMS + KM S		
Gear	III	II	I
Max airflow [m ³ /h] ⁽¹⁾	1100	800	500
Power supply [V/Hz]	3x400/50		
Max current Fan consumption [A]	0,6	0,4	0,3
Max Fan power consumption [W]	130	90	70
Fan IP/ Insulation class	54/F		
Acoustic power level [dB(A)] ⁽²⁾	71,4	65,8	59,0
Max acoustic pressure level [dB(A)] ⁽³⁾	56,3	50,7	43,9
Horizontal range ⁽⁴⁾ [m]	7,5	5,5	3,5
Installation	Indoor		
Max working temperature [°C]	50		
Device mass [kg]	36,1		

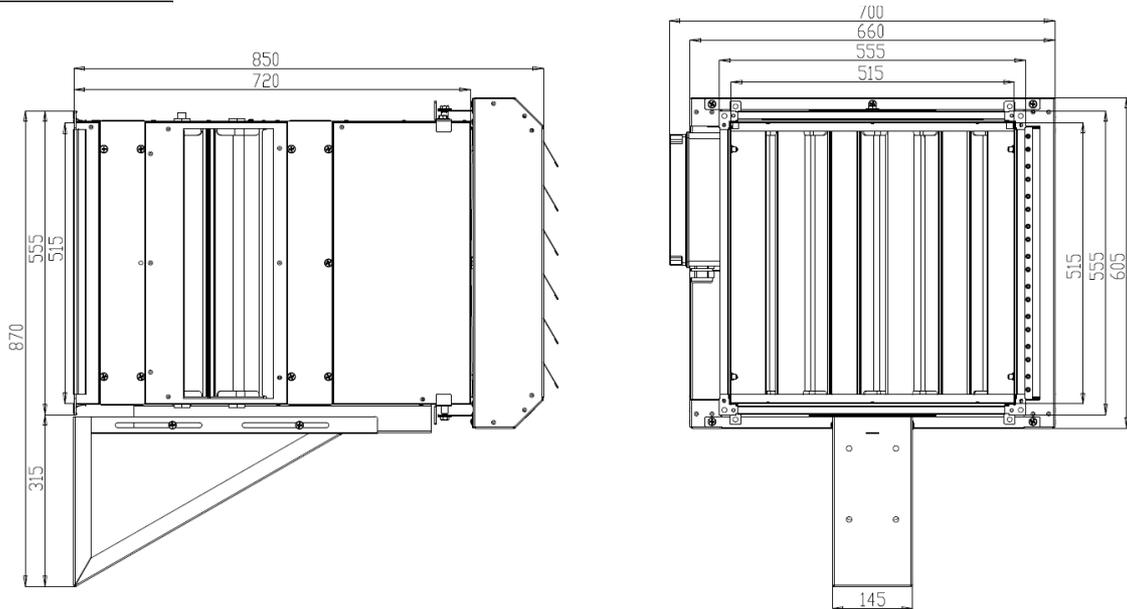
(1) Max. air flow with installed filter EU3 and wall air intake.

(2) Acoustic power level according to EN ISO 3744:2011

(3) Acoustic pressure level has been measured 5m from the unit in a 1500m³ space with a medium sound absorption coefficient

(4) Horizontal isothermal range for 0,5 m/s border air stream speed

3. TECHNICAL DATA



	LEO EL L BMS + KM L		
Gear	III	II	I
Max airflow [m ³ /h] ⁽¹⁾	2600	1600	800
Power supply [V/Hz]	3x400/50		
Max current Fan consumption [A]	1,4	1,2	0,6
Max Fan power consumption [W]	330	240	120
Fan IP/ Insulation class	54/F		
Acoustic power level [dB(A)] ⁽²⁾	79,2	69,6	57,2
Max acoustic pressure level [dB(A)] ⁽³⁾	64,1	54,5	42,1
Horizontal range ⁽⁴⁾ [m]	14,5	9,0	4,5
Installation	Indoor		
Max working temperature [°C]	50		
Device mass [kg]	47,2		

(1) Max. air flow with installed filter EU3 and wall air intake

(2) Acoustic power level according to EN ISO 3744:2011

(3) Acoustic pressure level has been measured 5m from the unit in a 1500m³ space with a medium sound absorption coefficient

(4) Horizontal isothermal range for 0,5 m/s border air stream speed

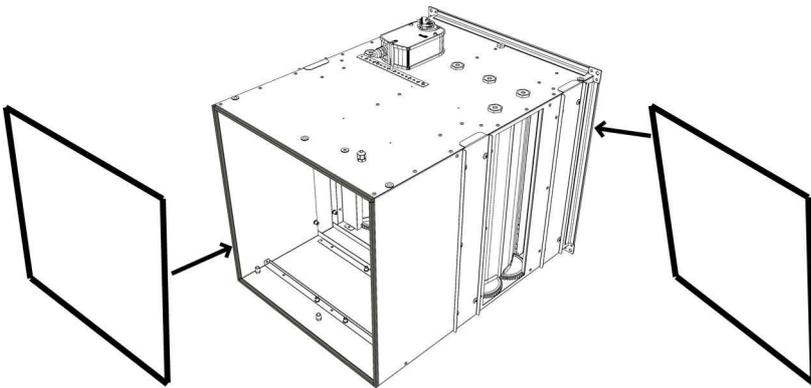
LEO EL S BMS + KM S				
Tp1	V	PT	PC	Tp2
[°C]	[m³/h]	[kW]*	[A]*	[°C]
1st step of heating; 2nd fan step				
-20	800	5,3	7,7	1
-10		5,2	7,5	8
0		5,1	7,4	16
10		5,0	7,2	23
20		4,9	7,1	32
2nd step of heating; 3rd fan step				
-20	1100	9,9	14,3	12
-10		9,7	14,0	20
0		9,4	13,5	28
10		9,1	13,1	32
20		8,8	12,7	39

LEO EL L BMS + KM L				
Tp1	V	PT	PC	Tp2
[°C]	[m³/h]	[kW]*	[A]*	[°C]
2nd step of heating; 2nd fan step				
-20	1600	14,5	20,8	5
-10		14,0	20,1	12
0		13,6	19,5	21
10		12,9	18,5	26
20		12,3	17,7	34
3rd step of heating; 3rd fan step				
-20	2600	20,9	30,2	10
-10		20,5	29,6	17
0		20,2	29,1	25
10		19,5	27,9	31
20		19,0	27,4	39

V – air flow
PT – heating capacity
PC – current consumption
Tp1 – inlet air temperature
Tp2 – outlet air temperature

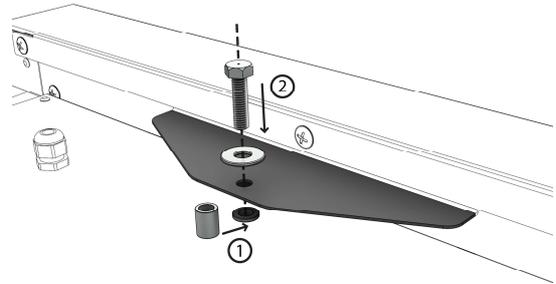
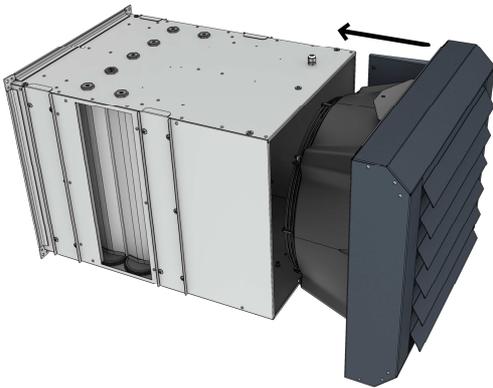
* including Fan parameters

4. INSTALLATION



4.2 FAN HEATER TO MIXING CHAMBER CONNECTION

KM S / L



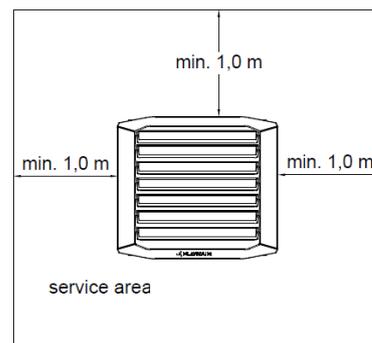
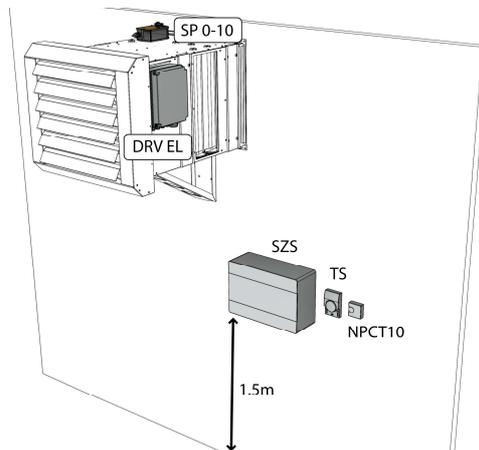
5. Automation KM EL LITE

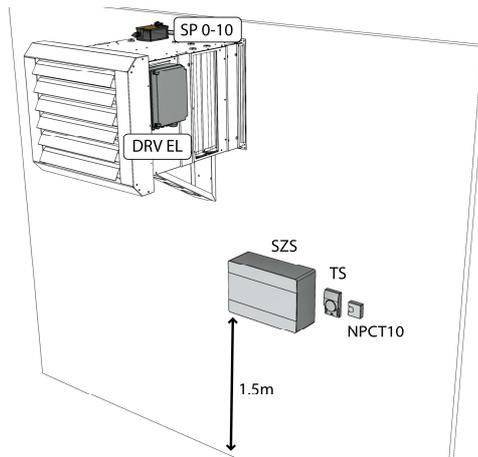
Automation KM EL LITE - complete power supply and control set for LEO EL S / L + KM S / L. The set includes:

- control box,
- damper actuator,
- NPCT 0-10 controller
- TS thermostat

Functionality:

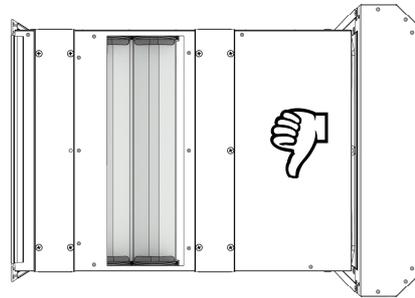
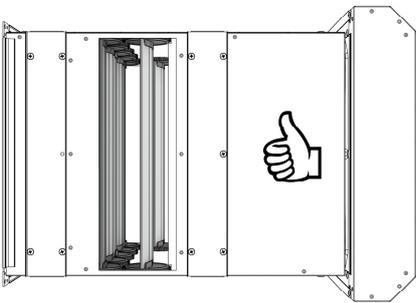
- stepless regulation of the dampers
- control of the roof fan in relation to the damper setting (the balance between LEO and UVO is only maintained when the LEO is working at max. efficiency)
- automatic closing of the dampers at the moment of switching off the heater.



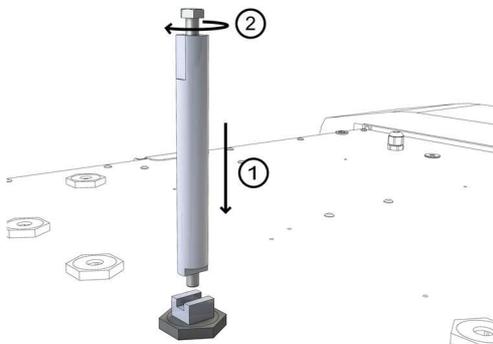


5.1. INSTALLATION OF ACTUATOR SP 0-10 (LF24-SR)

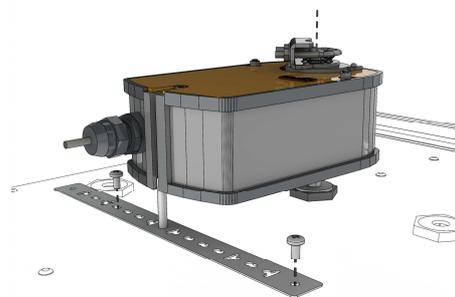
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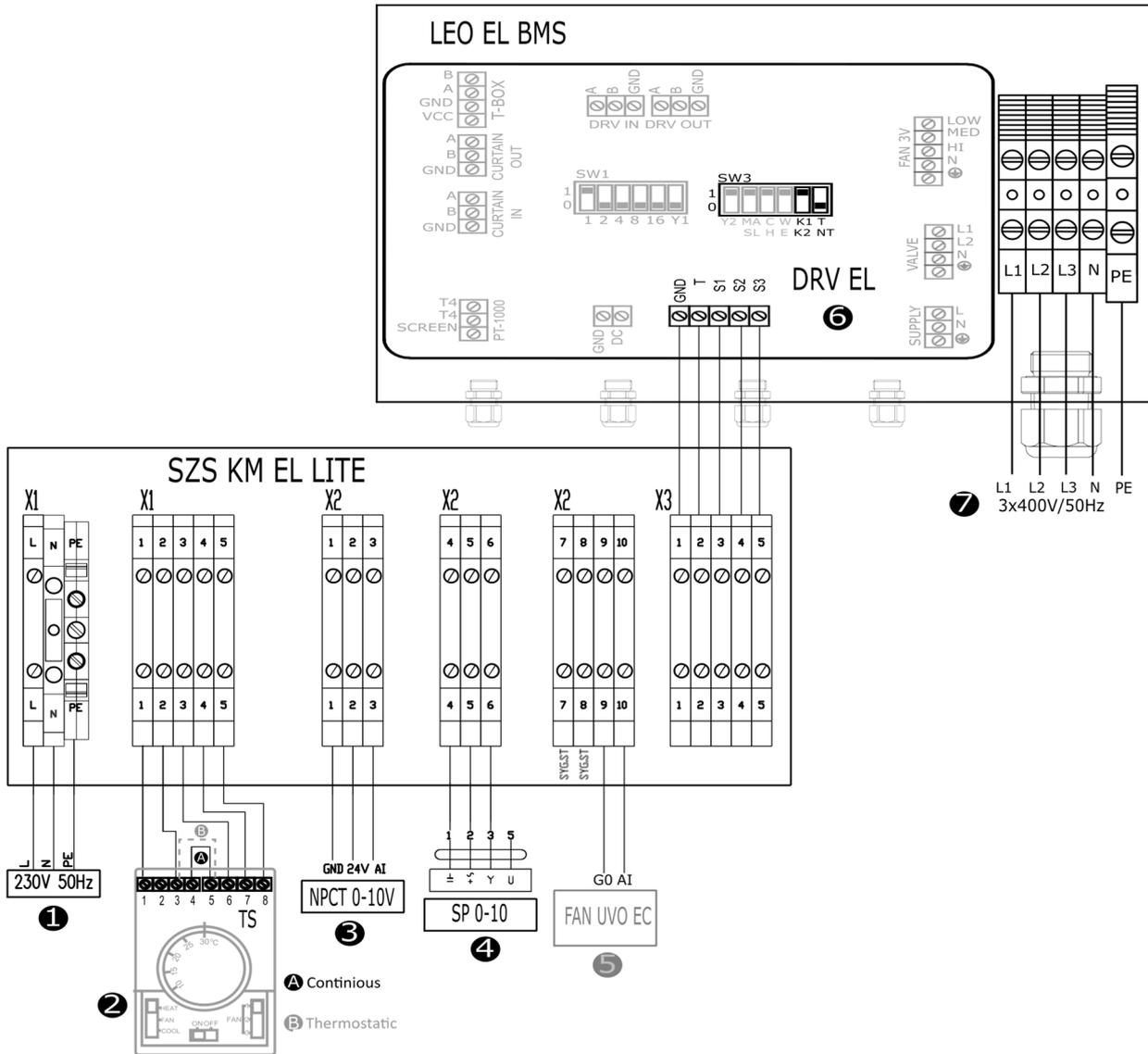
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3 SP 0-10 (LF24-SR)



5.2. CONNECTION DIAGRAMS



1. Power supply (min. 3x1,5 mm²)
2. 3- step fan speed regulator with thermostat TS (min. 5x1,0 mm²).

- **HEAT**- heating mode
- **FAN** - room thermostat deactivated
- **COOL** - cooling mode

	LEO EL S	LEO EL L
• 1	1 st step of heating; 2 nd fan step	2 nd step of heating; 2 nd fan step
• 2	2 nd step of heating; 3 rd fan step	3 rd step of heating; 3 rd fan step
• 3	Ventilation (fan operate on 3 rd step)	

3. NPCT 0-10V dampers and fan controller (LiYCY 3x0,75 mm²)

4. SP 0-10 dampers actuator with return spring (LiYCY 3x0,75 mm²)

5. Exhaust roof fan UVO EC (option) (LiYCY 2x0,75 mm²)

6. DRV EL control module for LEO EL BMS (min. 5x1,0 mm²)

SW3:

NT - Continuous mode (After reaching the temperature, turning off the heating elements and continuous operation of the fan)

K1 – LEO EL L BMS

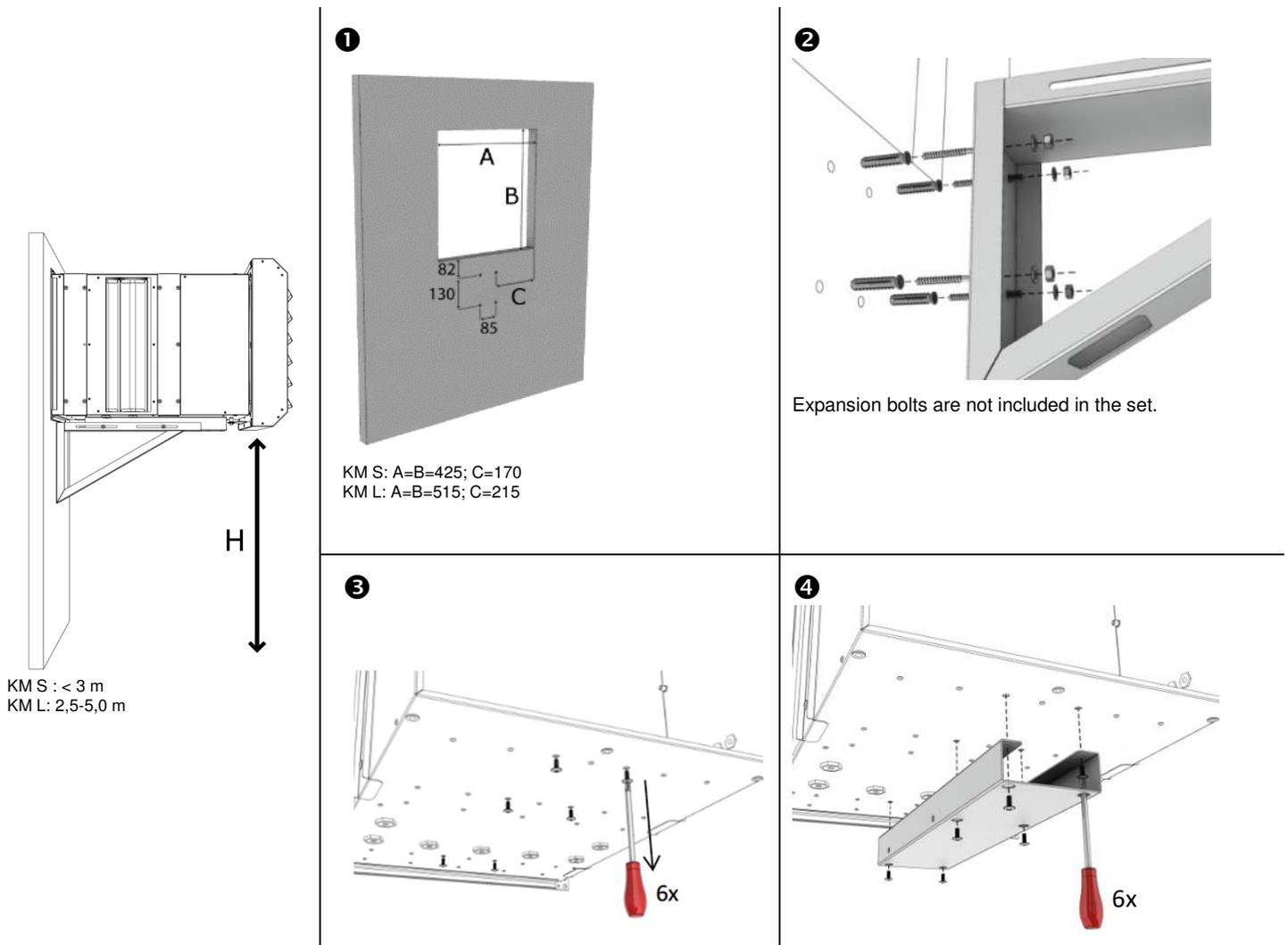
K2 – LEO EL S BMS

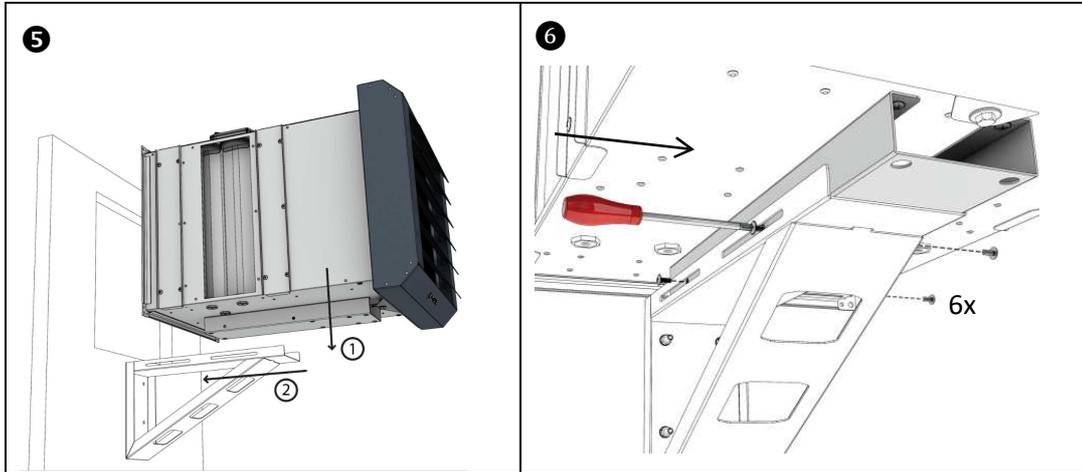
Each time the device is switched off the heaters are being cooled for next 30 seconds

7. Power supply | Zasilanie

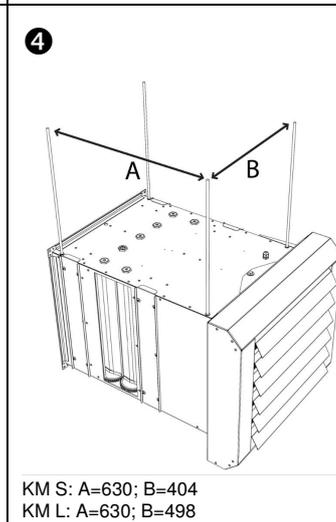
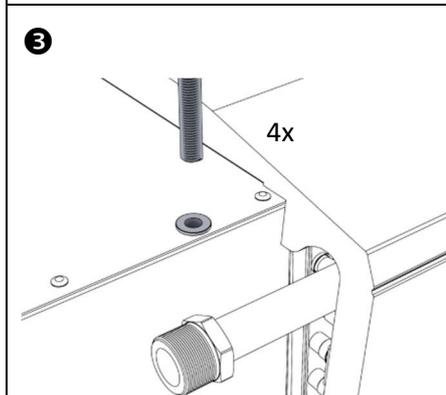
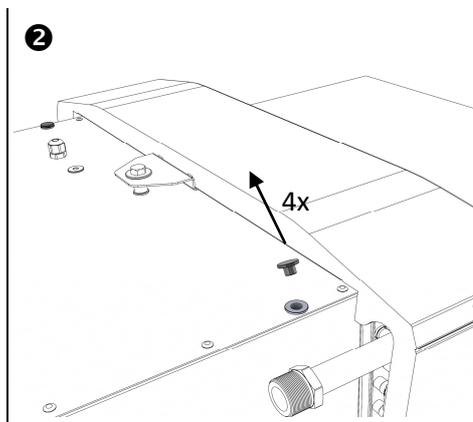
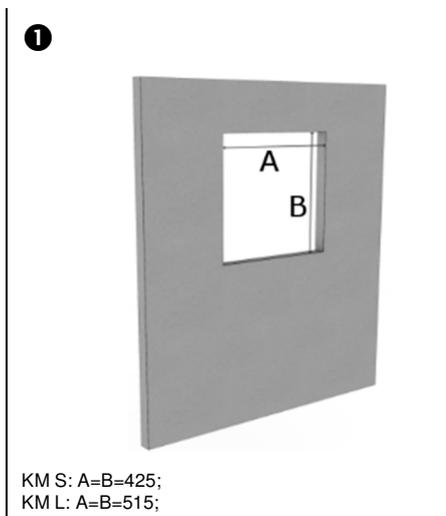
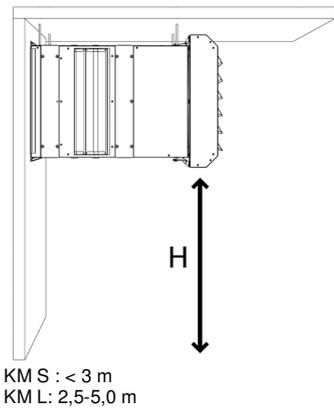
- LEO EL S BMS (min. 5x4,0 mm²) (Circuit protection B20)
- LEO EL L BMS (min. 5x6,0 mm²) (Circuit protection B40)

6. INSTALLATION KM TO THE WALL ON CONSOLE





6. INSTALLATION KM TO THE WALL ON PINS



7. START-UP AND OPERATION

Start-up

- supply and controls have to be connected as shown in technical manual
- before connecting supply check that current is same as on the nameplate
- start-up without grounding cable is forbidden

Operation

- unit designed to indoor operation
- never place any things on the casing while operating
- unit should be serviced periodically; in case of failure the unit should be switched off immediately



Never operate a failure unit. The producer does not take any responsibility for damages caused by failure operation.

Switch off the electrical supply while servicing or cleaning.

Periodic inspections

To keep proper technical parameters Flexiheat recommends periodic service (every 6 months) of fan heaters on behalf of the user. During inspections user should:

- Check heating elements, if it is filled with dirt or dust. If necessary - use industrial vacuum cleaner or pressurized air stream to clean the exchanger's lamellas. Excessive dirt on the heaters can cause permanent loss of the rated parameters
- Check fan blades, in case of dirt use damp cloth and remove dirt,
- Check bracket installation,
- Check wires insulation,
- Check power supply,
- Check the filter
- Check levelling of the unit.

8. SERVICE

Please contact your dealer in order to get acquitted with the warranty terms and its limitation.

In the case of any irregularities in the device operation, please contact the manufacturer's service department.

The manufacturer bears no responsibility for operating the device in a manner inconsistent with its purpose, by persons not authorised for this, and for damage resulting from this!

Made in EU

Declaration Of Conformity

Flexiheat hereby confirms that control units:

were produced in accordance to the following Europeans Directives:

1. **2014/35/UE** – *Low Voltage Electrical Equipment (LVD)*,

and harmonized with below directives norms:

PN-EN 61439-1:2011 Low-voltage switchgear and controlgear assemblies - Part 1: General rules

PN-EN 61439-2:2011 Low-voltage switchgear and controlgear assemblies - Part 2: Power switchgear and controlgear assemblies

Gdynia, 19.11.2018
Product Manager





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MT-DTR-KM-EL-S-L-EN-PL-NL-RU-V2