



LEO HD

Nagrzewnica wodna

Dokumentacja techniczno-rozruchowa

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1. Important information

We have made every effort to make this manual as easy to understand as possible. However, if you have any difficulties, problems or questions, please contact FLOWAIR support at: info@flowair.pl.

Also visit our website www.flowair.pl where you will find mounting tips.

In this manual you will find important safety information and tips marked as below:

WARNING

Dangerous practices which may result in serious injury or death. Read all warnings before starting work.

CAUTION

Unsafe practices which, if not avoided, may result in damage to property or minor injuries. Before starting work, read all cautions.

ADVICE

Useful tips for the user and installer.

IMPORTANT SAFETY INFORMATION:

ADVICE

- Before installing, connecting, starting up, using and maintaining the device, please read this manual completely.
- After receiving the product, check that it has not been damaged during transport. If the product appears to be damaged, DO NOT START TO MOUNT THE DEVICE; instead, you must immediately report the damage to the delivery man.
- The device must be mounted in a stable way and in accordance with the instructions, in a place that can be easily accessed, thus ensuring the possibility of carrying out repairs and routine maintenance, as well as allowing easy and safe disassembly of the device.
- The stability and durability of installation of the device depends on the structure of the building (in particular walls and ceilings). The person performing the assembly should take these conditions into account when mounting the device.
- The technical documentation should be kept in a safe place, easily accessible to the user and service technician.
- Always test the operation of the device after installation.

CAUTION

- The power connection shall be performed only by an authorized person.
- The device is not equipped with a thermostat that controls the room temperature. Do not use the device in small rooms where there are people who are not able to leave the premises alone. Above mentioned does not apply to rooms with constant supervision.
- The device requires periodic inspections in accordance with the instructions in this manual.
- Do not hang/put pressure on the device.
- Do not place any objects on the device or hang anything on the connection stubs.
- The product should be stored and assembled out of the reach of small children.
- **The device is dedicated to work indoors with a maximum air dustiness of 0.3 g/m³.**
- **Equipment cannot be used in an environment where oil mist is present.**
- This equipment may be used by children that are at least 8 years old, by persons with reduced physical and mental abilities and persons with no experience and knowledge of the equipment, on condition that the supervision or instruction regarding correct use of the equipment in a safe manner is provided and the possible threats are understood. The device cannot be used by children to play. Unattended children should not clean or maintain the equipment.

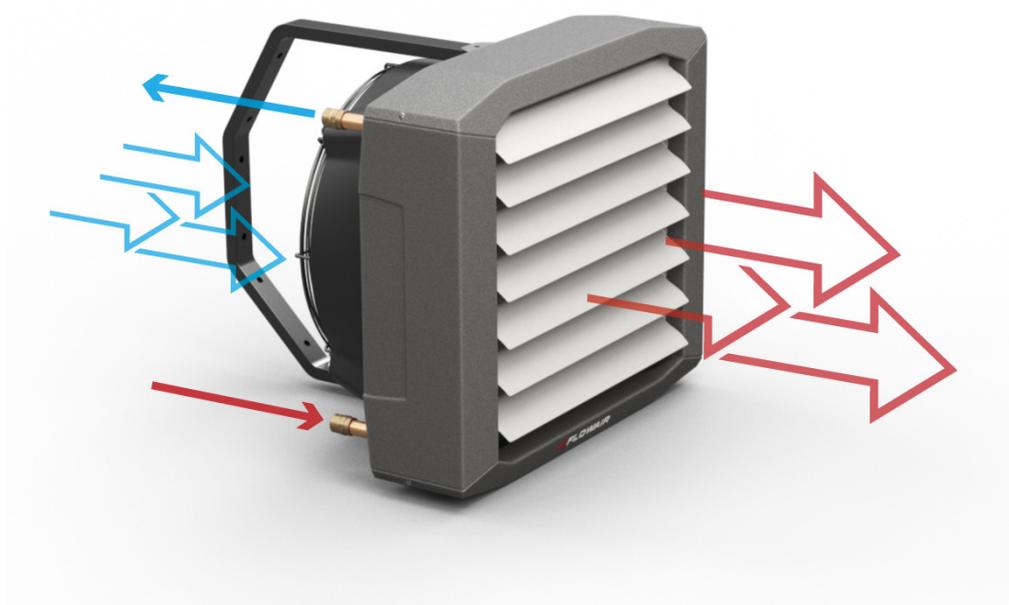
WARNING

- The device is powered by dangerous voltage. Always disconnect the device from the power supply before servicing or accessing its internal components.
- Do not insert your fingers or any objects inside the device.
- Do not cover the device.

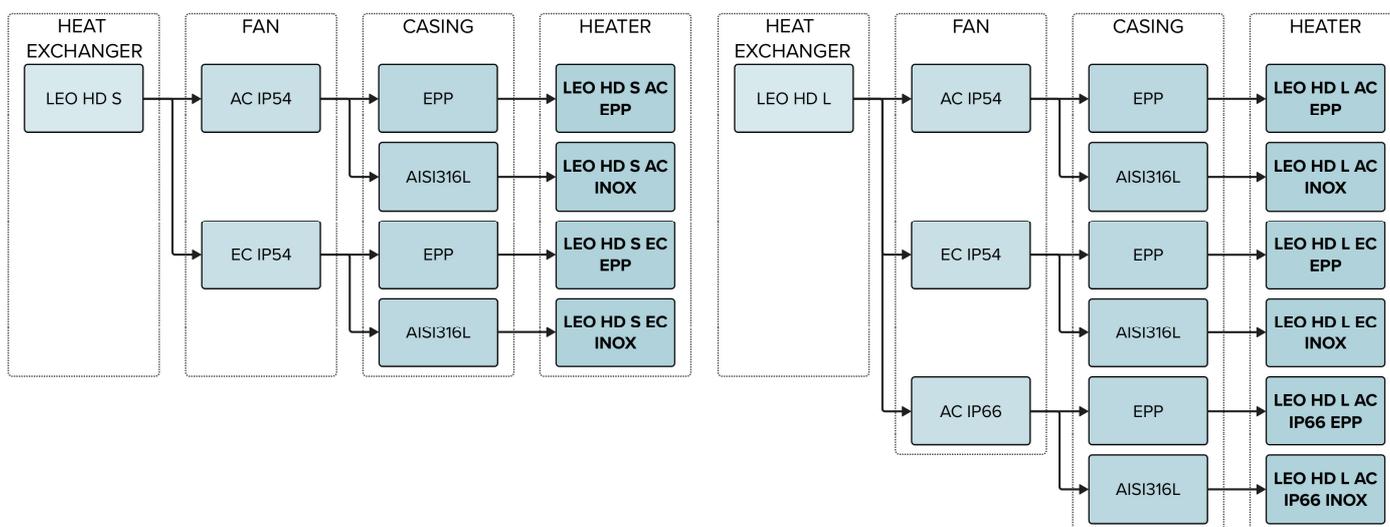
2. General information and purpose

The LEO HD water heater is an executive element of a decentralized heating system for industrial buildings. Using the principle of forced convection, powered by a heating medium, it heats the ambient air through recirculation. Designed for heating facilities of various sizes. LEO HD is intended for construction facilities requiring devices with increased resistance to environmental conditions.

The water heat exchanger installed in the heater is covered with a special, pigmented PoluAl XT Blygold polyurethane coating, which is characterized by very high resistance to corrosion and chemical compounds (in accordance with the table on page 31). The metal components used together with the water exchanger meet the requirements of ISO 12944-6:2018 (corrosion class C5-h).



LEO HD available types:

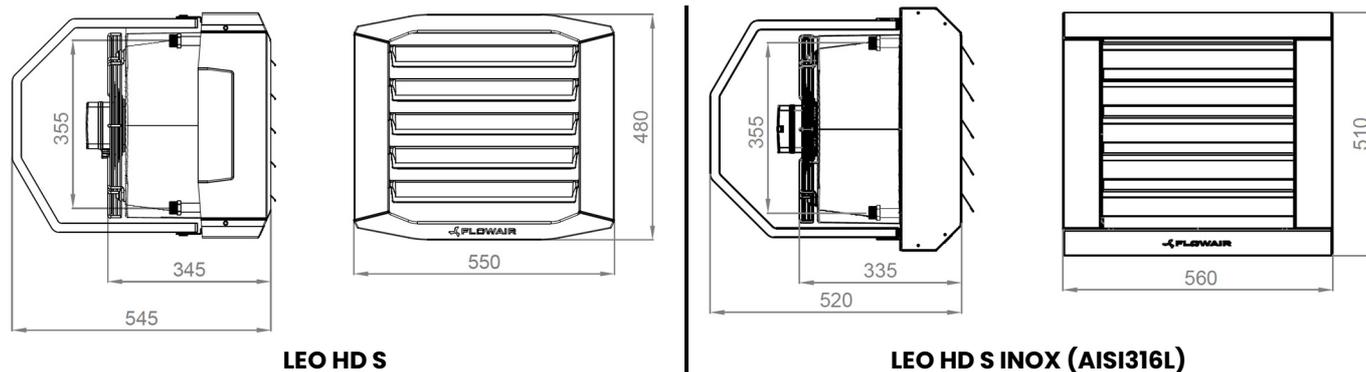


3. PoluAI XT coating resistance table

| Inorganic acids | Max. concentration [ppm] | Organic acids | Max. concentration [ppm] | |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Arsenic acid | 641 | Acetic acid | 320 | |
| Boric acid | | Benzoic acid | | |
| Hydrogen carbonate | | Lactic acid | | |
| Chromic acid | | Phenols | | |
| Bromic acid | 320 | Citric acid | | |
| Hydrochloric acid | | Fatty acids | | |
| Hydrogen fluoride | | Formic acid | | |
| Hydrogen sulphide | | Hydrocyanic acid | | |
| Nitric acid | | Malic acid | | |
| Sulphuric acid | | Margaric acid | | |
| Phosphoric acid | | Picric acid | | |
| Perchloric acid | | Oleic acid | | |
| Selenic acid | | Oxalic acid | | |
| Arsenic acid | | Sulphamic acid | | |
| Alkalines | Max. concentration [ppm] | Wine stone acid | 80 | |
| Ammonia | 160 | Barn stone acid | | |
| Sodiumhydroxyde | 20 | Palmitic acid | | |
| Potassium hydroxyde solution | | Tannin | | |
| Lithium hydroxyde | | Phthalic acid | | |
| Calciumhydroxyde | | Propionic acid | | |
| Magnesium hydroxyde | | Salicylic acid | | |
| Salts and watersolutions | Max. concentration [ppm] | Ketones and Aldehydes | | Max. concentration [ppm] |
| Sodiumsalts | 640 | Acetone | | 320 |
| Potassiumsalts | | Aceetaldehyde | | |
| Calciumsalts | | Benzaldehyde | | |
| Aluminiumsalts | | Formaldehyde | | |
| Ammoniumsalts | | Salicylaldehyde | | |
| Bariumsalts | | Diisobutylketone | | |
| Coppersalts | | Methylisobutylketone | | |
| Leadsalts | | Methylethylketone | | |
| Lithiumsalts | | Butanal | | |
| Magnesiumsalts | | Alcohols | Max. concentration [ppm] | |
| Mercurysalts | | Methanol | 320 | |
| Lithopone | | Ethanol | | |
| Hydroquinone | | Isopropanol | | |
| Ironsalts | n-Butanol | | | |
| Aromatic hydrocarbons | Max. concentration [ppm] | Amylalcohol | | |
| Xylene | 640 | Benzylalcohol | | |
| Toluene | | Diacetonalcohol DAA | | |
| Asphalt | | Glycerine | | |
| Anthracene | | n-Propanol | | |
| Benzapherene | | Pentanol | | |
| Benzene | | | | |
| Solventnaphta | | | | |
| Naphtalene | | | | |
| Terpenes | | | | |
| Others | | Max. concentration [ppm] | | |
| Carbondisulphide | 160 | | | |
| Hydrogenperoxyde | 320 | | | |
| Hydrogensulphide | 20 | | | |
| Chlorine | 64 | | | |

4. Technical data and general dimensions

4.1. LEO HD S; LEO HD S INOX



| Device | LEO HD S AC | | | LEO HD S EC | | | |
|-------------------------------------|----------------|----------|------|-------------|------|----------|------|
| | 3 | 2 | 1 | 10 | 8 | 6 | 4 |
| Gear (AC) Voltage set [V] (EC) | 3 | 2 | 1 | 10 | 8 | 6 | 4 |
| Airflow [m ³ /h]* | 2000 | 1600 | 1250 | 1650 | 1300 | 950 | 600 |
| Heating power (70/50/15°C) | 11,8 | 10,4 | 9,0 | 10,4 | 9,2 | 7,6 | 5,6 |
| Outlet temperature [°C] | 27,5 | 29,0 | 31,0 | 29,0 | 31,0 | 33,5 | 37,5 |
| Heating power (45/35/15°C) | 7,1 | 6,2 | 5,4 | 6,3 | 5,5 | 4,5 | 3,3 |
| Outlet temperature [°C] | 20,5 | 21,5 | 22,5 | 21,5 | 22,5 | 24,0 | 26,5 |
| Supply [V/Hz] | 230 V / 50 | | | | | | |
| Current consumption [A] | 0,60 | 0,40 | 0,30 | 0,55 | 0,31 | 0,15 | 0,10 |
| Power consumption [W] | 130,0 | 90,0 | 70,0 | 60,0 | 41,0 | 22,0 | 10,0 |
| IP | 54 | | | | | | |
| Acoustic pressure level [dB(A)]** | 54,4 | 48,8 | 42,0 | 54,0 | 46,8 | 40,7 | 32,1 |
| Acoustic power level [dB(A)]*** | 71,4 | 65,8 | 59,0 | 71,0 | 63,8 | 57,7 | 49,1 |
| Horizontal range [m]**** | 27,0 | 22,0 | 17,0 | 22,5 | 18,0 | 13,0 | 8,5 |
| Vertical range [m]***** | 6,0 | 5,0 | 4,0 | 5,1 | 4,1 | 3,2 | 2,2 |
| Max. water temperature [°C] | 120 | | | | | | |
| Max. water pressure [MPa] | 1,6 | | | | | | |
| Connection stub ["] | 1/2 | | | | | | |
| Temperature working range [°C]***** | from -30 to 60 | | | | | | |
| Casing type | EPP | AISI316L | | EPP | | AISI316L | |
| Device mass [kg] | 12,4 | 17,2 | | 11,3 | | 16,1 | |
| Water filled device mass [kg] | 13,6 | 18,4 | | 12,5 | | 17,3 | |

* Airflow measured according to **EN ISO 5801**

** Acoustic pressure level for 3000m³ space with a medium absorption coefficient, at a distance of 5m from the device

*** Acoustic power level according to **PN-EN ISO 3744:2011**

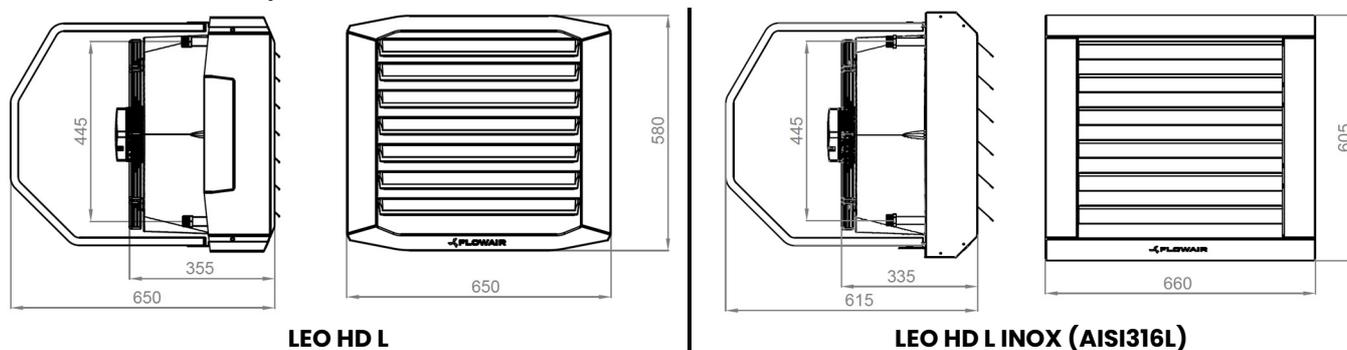
**** Isothermal horizontal range at 0,3m/s terminal speed

***** Non-isothermal vertical range for $\Delta T = 5^{\circ}\text{C}$ at 0,3m/s terminal speed

CAUTION

***** **WARNING! When operating at temperature below 0°C, glycol solutions (up to 60%) must be used as a heating medium to protect the heat exchanger against freezing.**

4.2. LEO HD L; LEO HD L INOX



| Device | LEO HD L AC | | | LEO HD L AC IP66 | | | | | LEO HD L EC | | | |
|-------------------------------------|----------------|----------|-------|------------------|----------|-------|-------|-------|-------------|----------|------|------|
| | 3 | 2 | 1 | 5 | 4 | 3 | 2 | 1 | 10 | 8 | 6 | 4 |
| Gear (AC) Voltage set [V] (EC) | | | | | | | | | | | | |
| Airflow [m ³ /h]* | 3800 | 2400 | 1400 | 3800 | 3500 | 2930 | 2300 | 1400 | 3000 | 2750 | 1850 | 950 |
| Heating power (70/50/15oC) | 20,8 | 15,8 | 11,1 | 20,8 | 19,8 | 17,9 | 15,4 | 11,1 | 18,1 | 17,2 | 13,4 | 8,5 |
| Outlet temperature [°C] | 31,0 | 34,5 | 38,5 | 31,0 | 31,5 | 33,0 | 34,5 | 38,5 | 33,0 | 33,5 | 36,5 | 41,0 |
| Heating power (45/35/15oC) | 11,3 | 8,6 | 6,0 | 11,3 | 10,8 | 9,7 | 8,4 | 6,0 | 9,8 | 9,3 | 7,3 | 4,6 |
| Outlet temperature [°C] | 24,0 | 25,5 | 27,5 | 24,0 | 24,0 | 25,0 | 25,5 | 27,5 | 24,5 | 25,0 | 26,5 | 29,0 |
| Supply [V/Hz] | 230 V / 50 | | | | | | | | | | | |
| Current consumption [A] | 1,50 | 1,20 | 0,60 | 1,70 | 1,34 | 1,21 | 1,04 | 0,80 | 1,30 | 0,80 | 0,38 | 0,14 |
| Power consumption [W] | 340,0 | 240,0 | 120,0 | 355,0 | 293,0 | 259,0 | 214,0 | 158,0 | 170,0 | 113,0 | 56,0 | 21,0 |
| IP | 54 | | | 66 | | | | | 54 | | | |
| Acoustic pressure level [dB(A)]** | 62,3 | 52,6 | 40,2 | 62,3 | 61,3 | 57,5 | 52,3 | 40,2 | 56,0 | 53,1 | 45,7 | 36,2 |
| Acoustic power level [dB(A)]*** | 79,2 | 69,6 | 57,2 | 79,2 | 78,3 | 74,5 | 69,3 | 57,2 | 73,0 | 70,1 | 62,7 | 53,2 |
| Horizontal range [m]**** | 41,0 | 26,0 | 15,5 | 41,0 | 38,0 | 32,0 | 25,0 | 15,5 | 33,0 | 29,5 | 20,0 | 10,5 |
| Vertical range [m]***** | 8,3 | 5,6 | 3,6 | 8,3 | 7,7 | 6,6 | 5,4 | 3,6 | 6,8 | 6,3 | 4,5 | 2,6 |
| Max. water temperature [°C] | 120 | | | | | | | | | | | |
| Max. water pressure [MPa] | 1,6 | | | | | | | | | | | |
| Connection stub ["] | 3/4 | | | | | | | | | | | |
| Temperature working range [°C]***** | from -30 to 60 | | | | | | | | | | | |
| Casing type | EPP | AISI316L | | EPP | AISI316L | | | | EPP | AISI316L | | |
| Device mass [kg] | 18,5 | 24,4 | | 19,4 | | 25,3 | | | 16,6 | | 22,5 | |
| Water filled device mass [kg] | 20,5 | 26,4 | | 21,4 | | 27,3 | | | 28,6 | | 24,5 | |

* Airflow measured according to **EN ISO 5801**

** Acoustic pressure level for 3000m³ space with a medium absorption coefficient, at a distance of 5m from the device

*** Acoustic power level according to **PN-EN ISO 3744:2011**

**** Isothermal horizontal range at 0,3m/s terminal speed

***** Non-isothermal vertical range for $\Delta T = 5^{\circ}\text{C}$ at 0,3m/s terminal speed

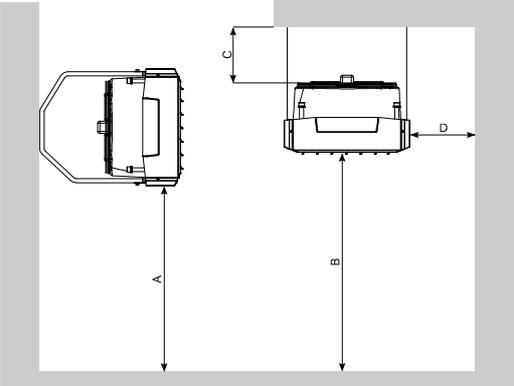
CAUTION

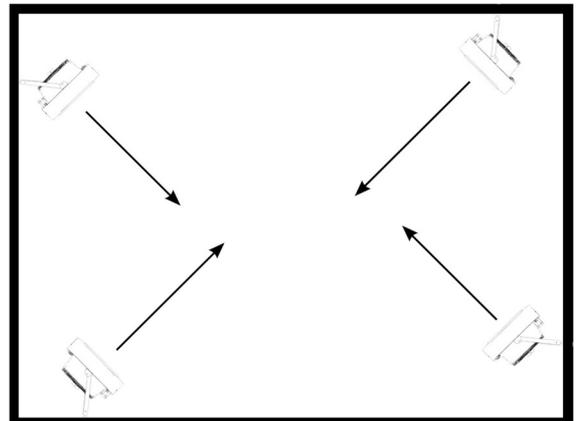
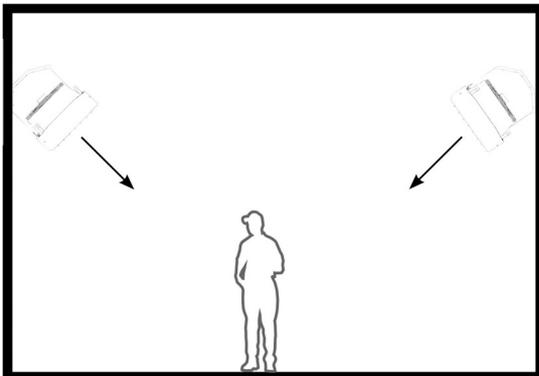
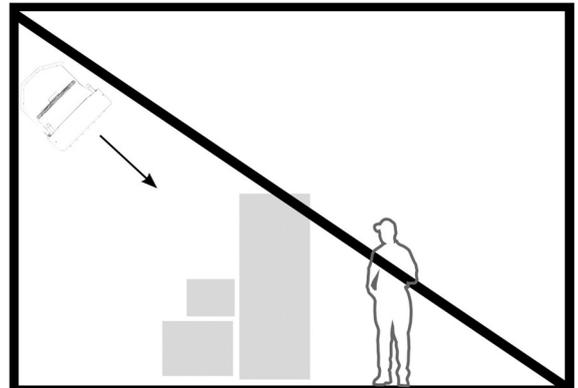
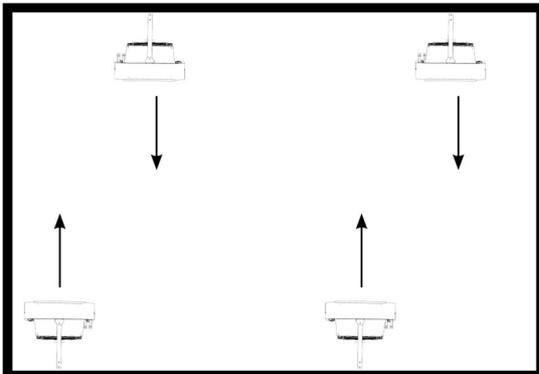
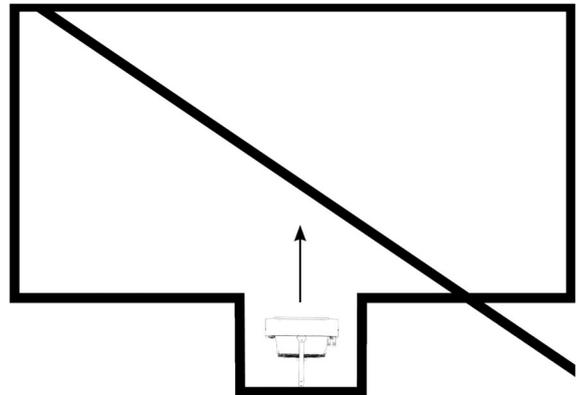
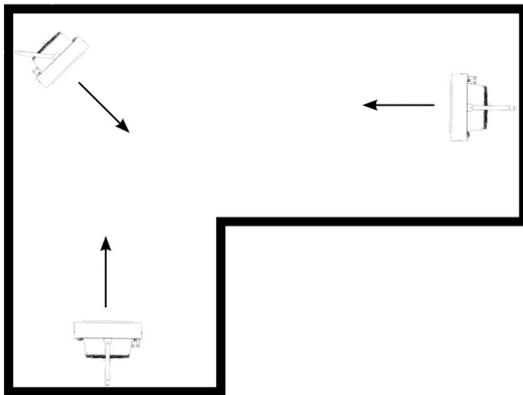
***** **WARNING! When operating at temperature below 0°C, glycol solutions (up to 60%) must be used as a heating medium to protect the heat exchanger against freezing.**

5. Installation and air ranges

5.1. Arrangement methods and recommended distances

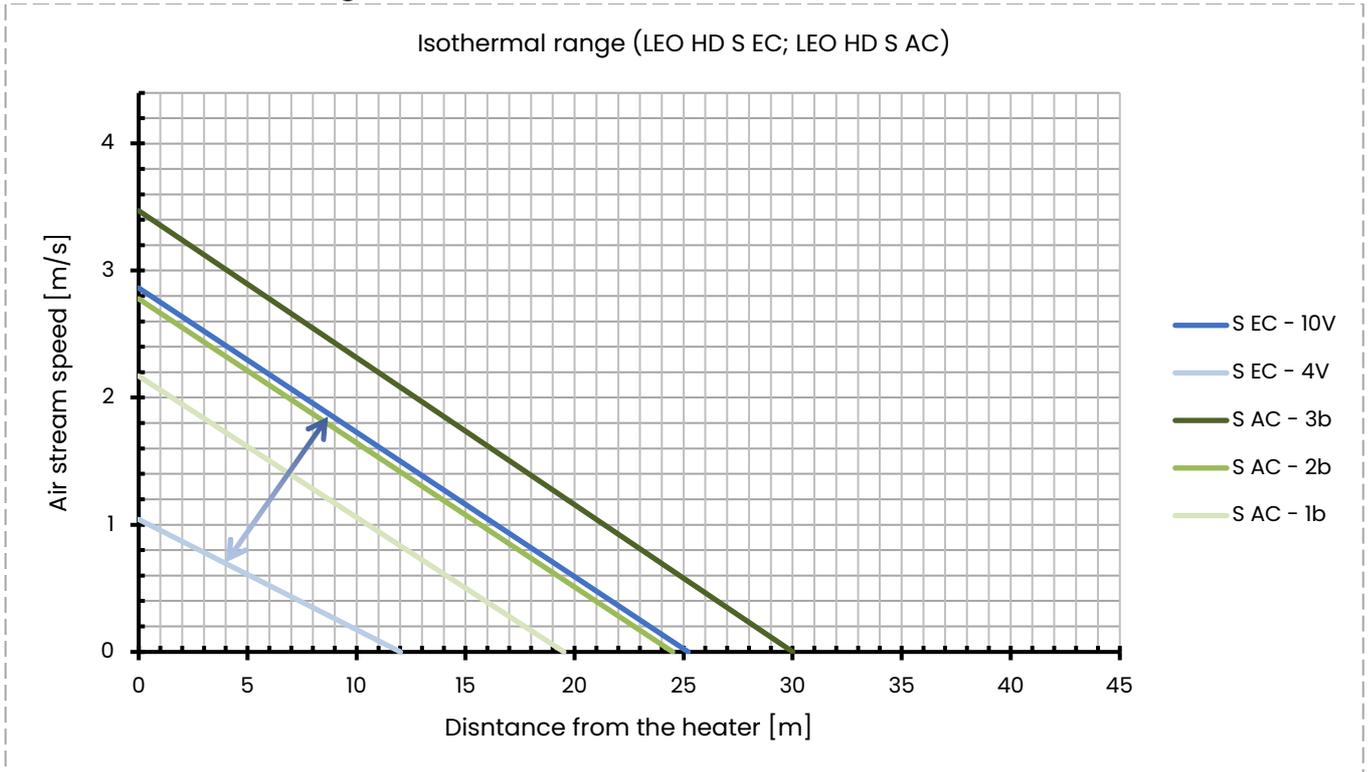
Heaters can be mounted to vertical and horizontal partitions. During installation, maintain the recommended distances from the partitions presented below.

| | | |
|---|-------|-----------------------------|
|  | | LEO HD S LEO HD L |
| | A [m] | min. 3 (see paragraph 5.2.) |
| | B [m] | min. 3 (see paragraph 5.2.) |
| | C [m] | min. 0,3 |
| | D [m] | min. 0,1 |

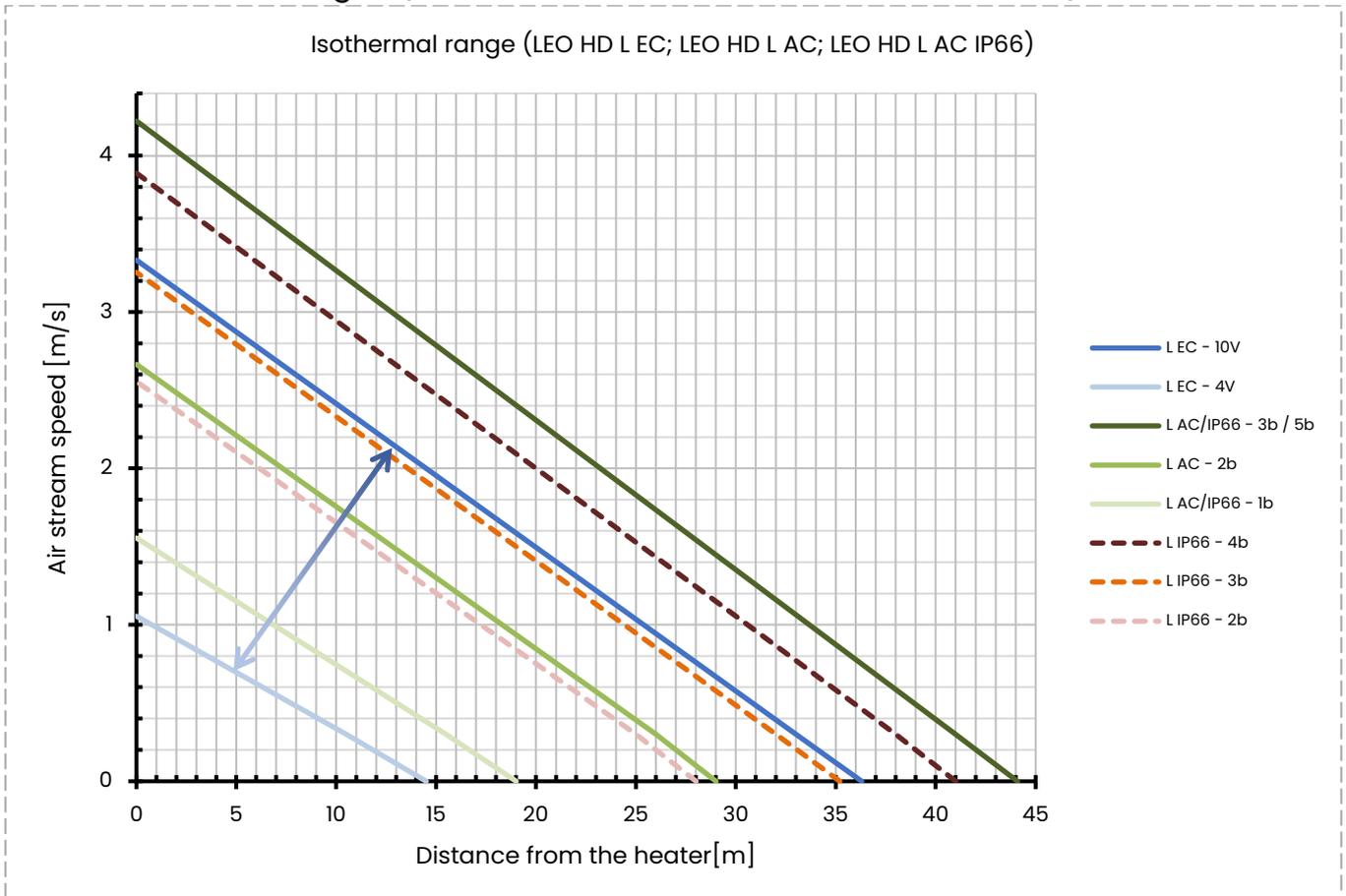


5.2. Air stream speeds and ranges

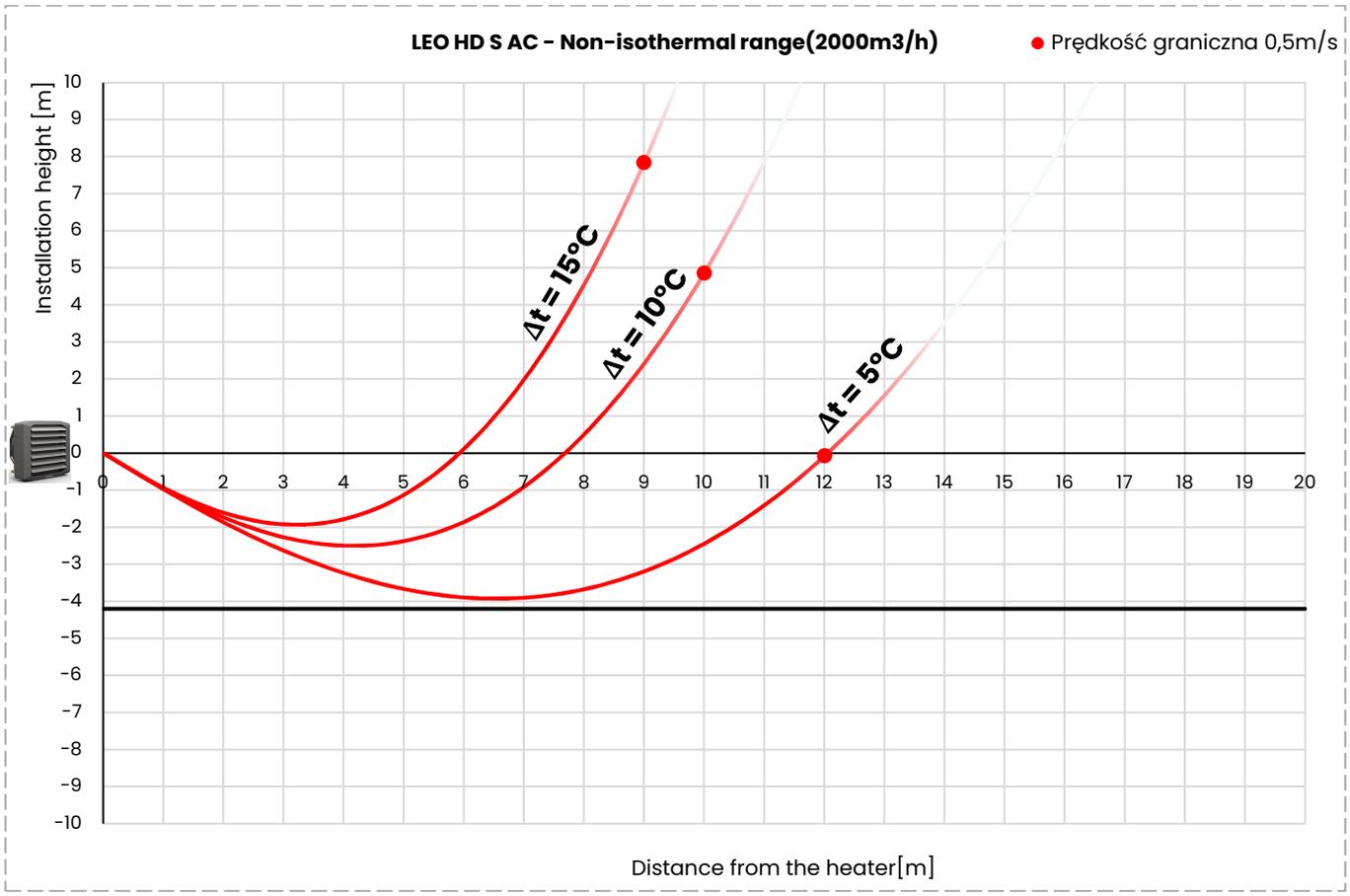
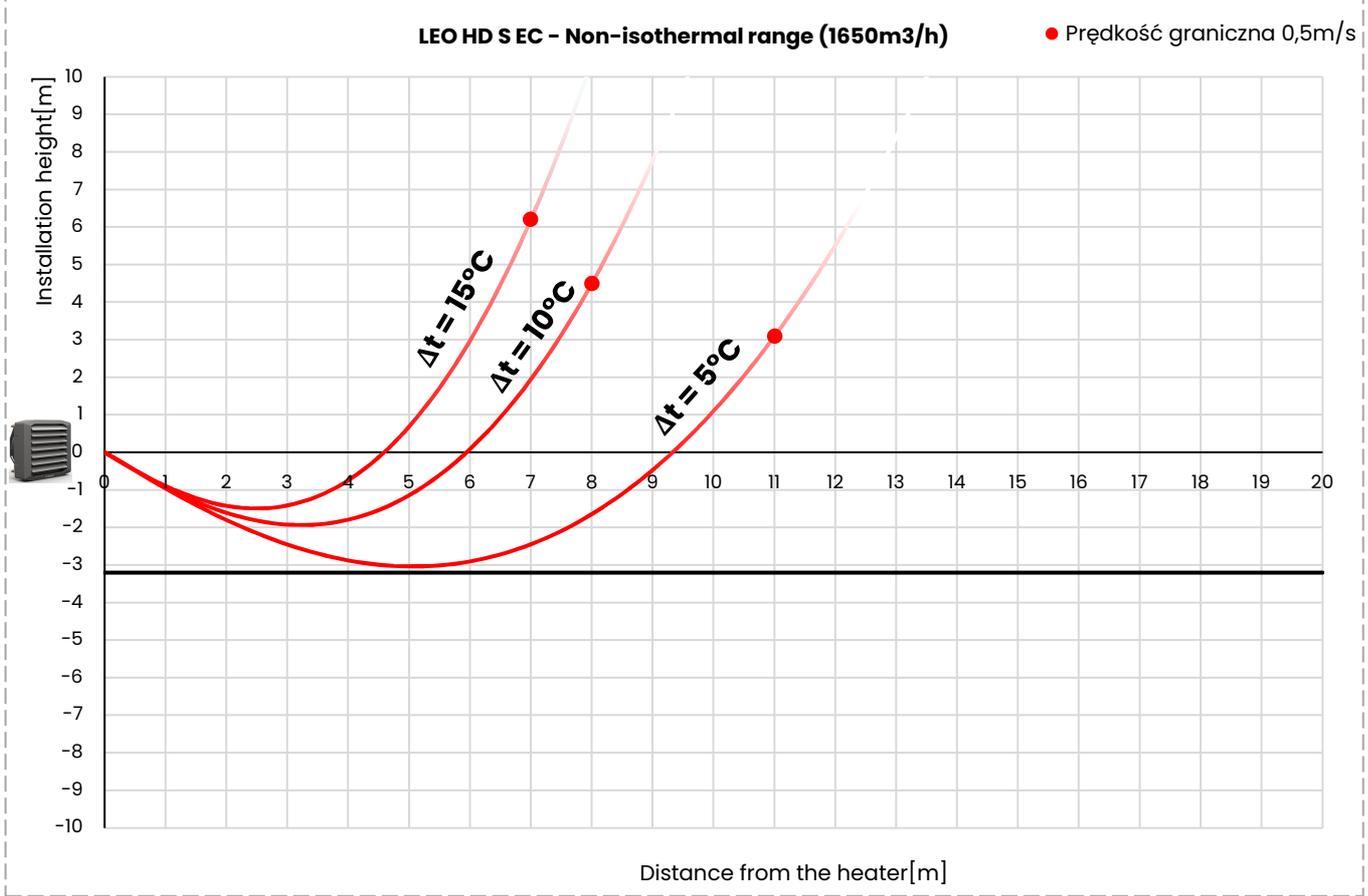
5.2.1. Isothermal ranges (LEO HD S AC; LEO HD S EC)



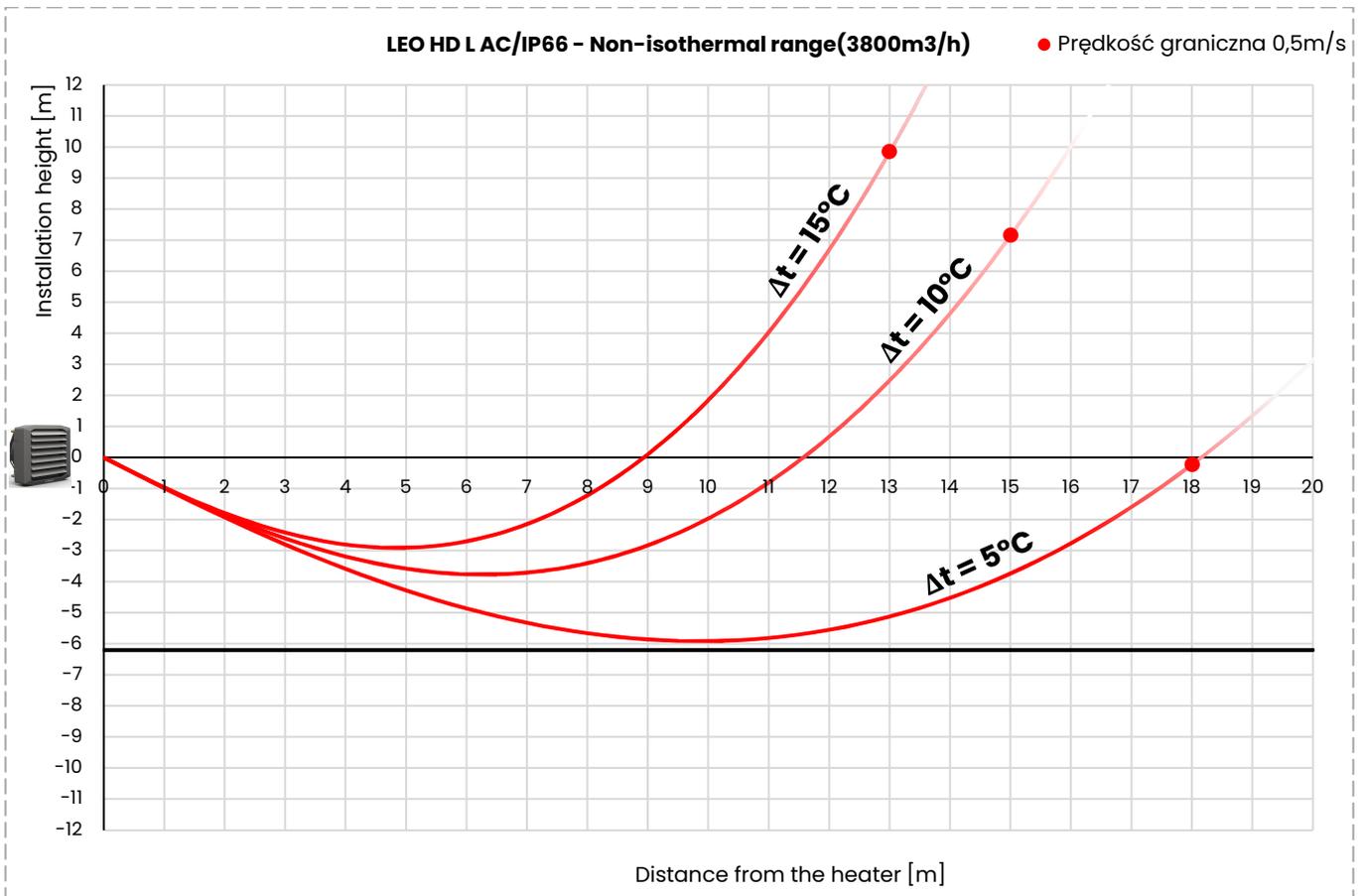
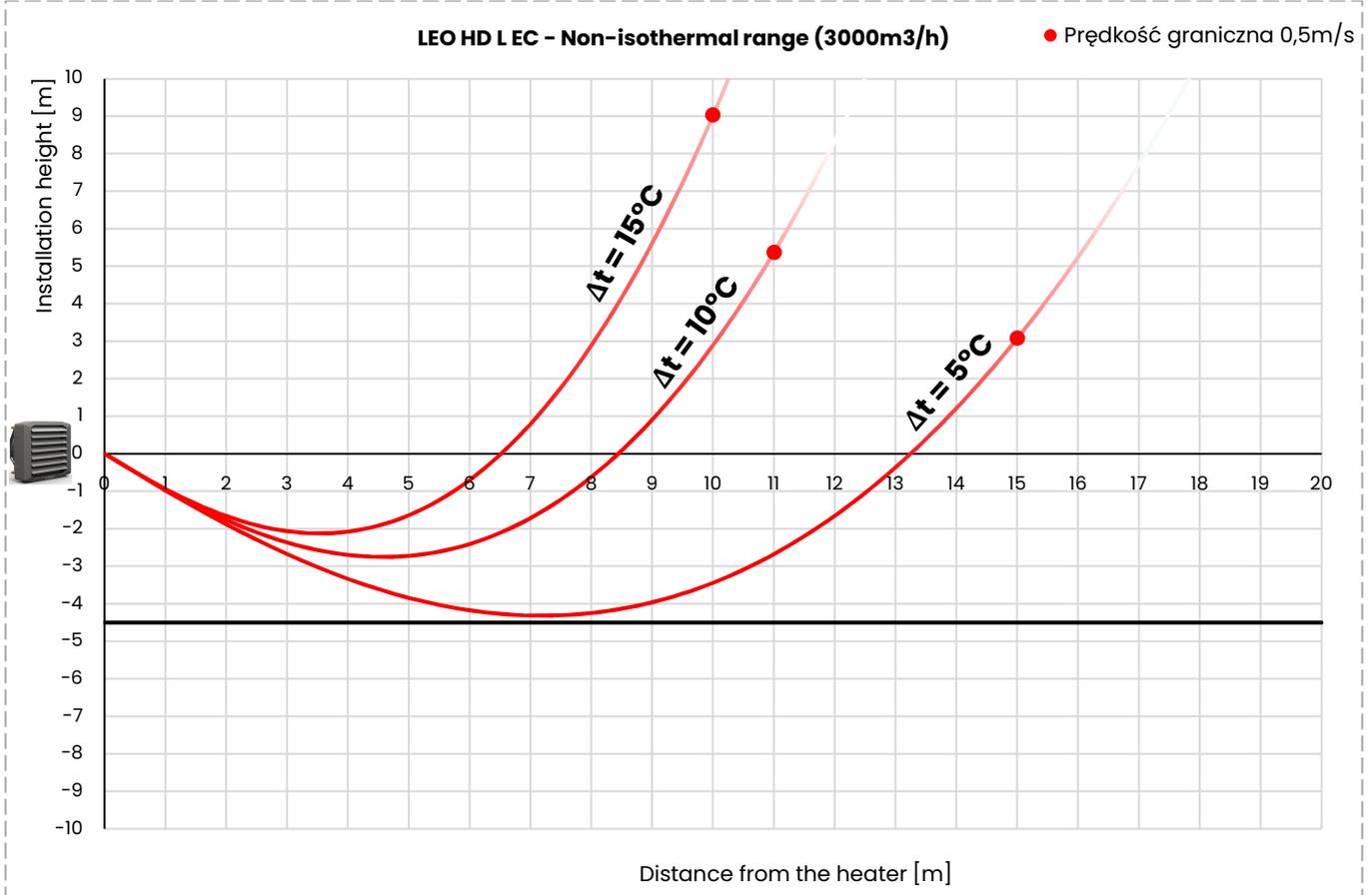
5.2.2. Isothermal ranges (LEO HD L AC; LEO HD L EC; LEO HD L AC IP66)



5.2.3. Non-isothermal ranges (LEO HD S EC; LEO HD S AC)

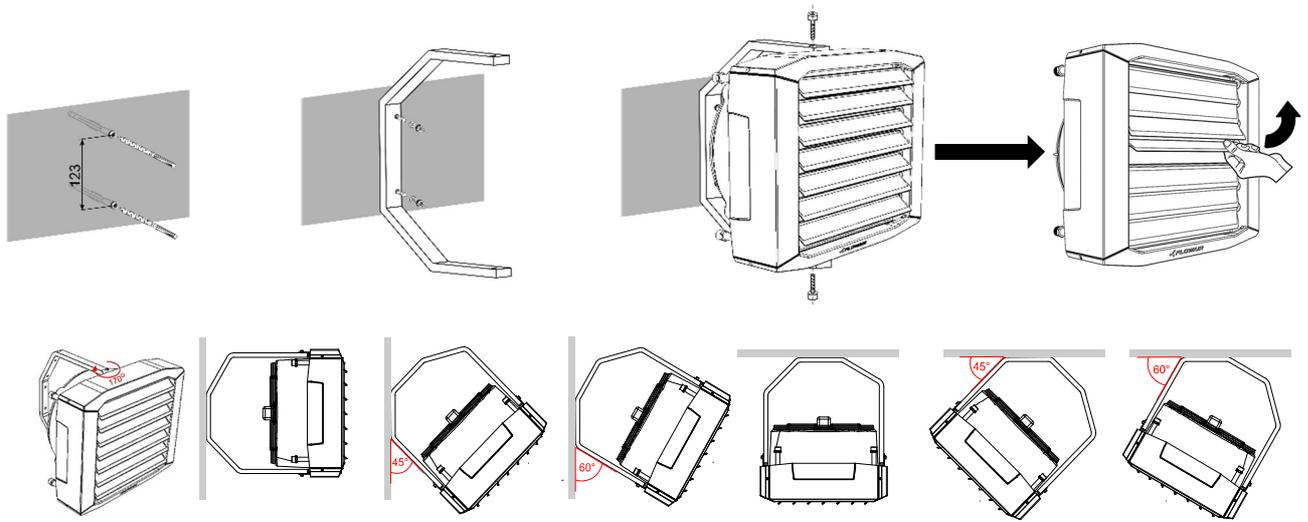


5.2.4. Non-isothermal ranges (LEO HD L EC; LEO HD L AC/IP66)



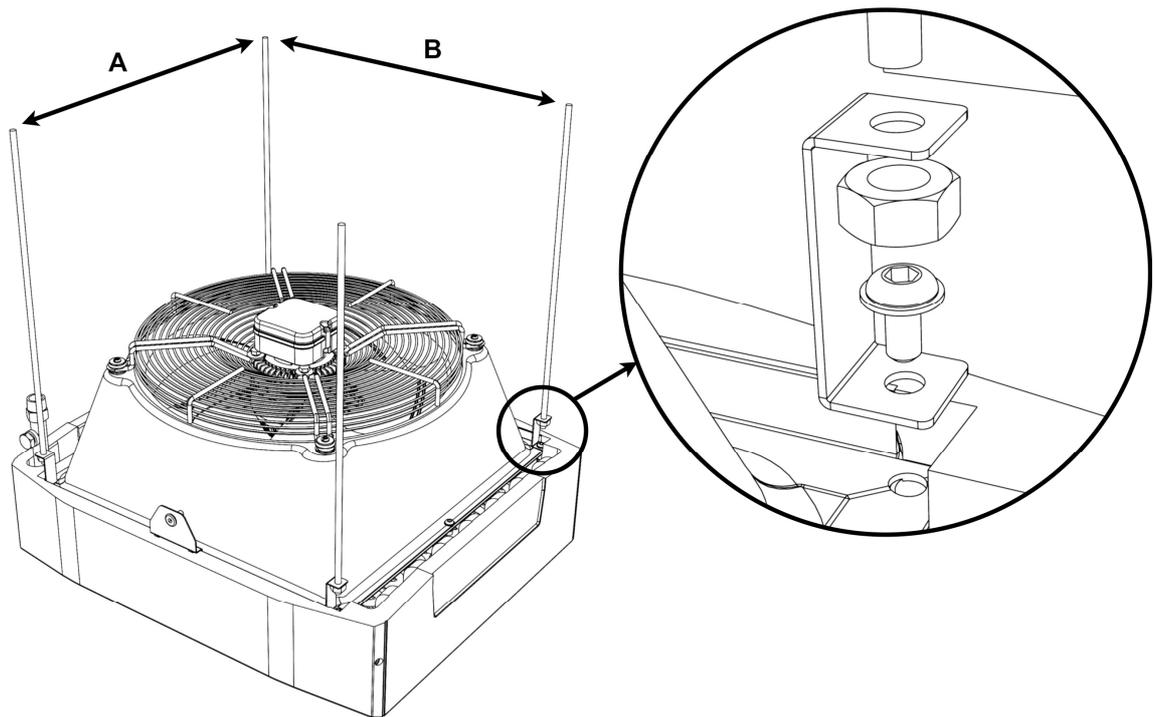
5.3. Rotating console installation

Mounting screws (M8x20) are supplied with the rotating console. Before installing the heater, the must be unscrewed. Remember to tilt the air blades to ensure proper air flow.



5.4. Ceiling holders installation

Ceiling holders are optional equipment. They should be installed of the corners of the heater. To do this, first remove the screws and then use them to screw in the ceiling holders. Installation in other places are not allowed.



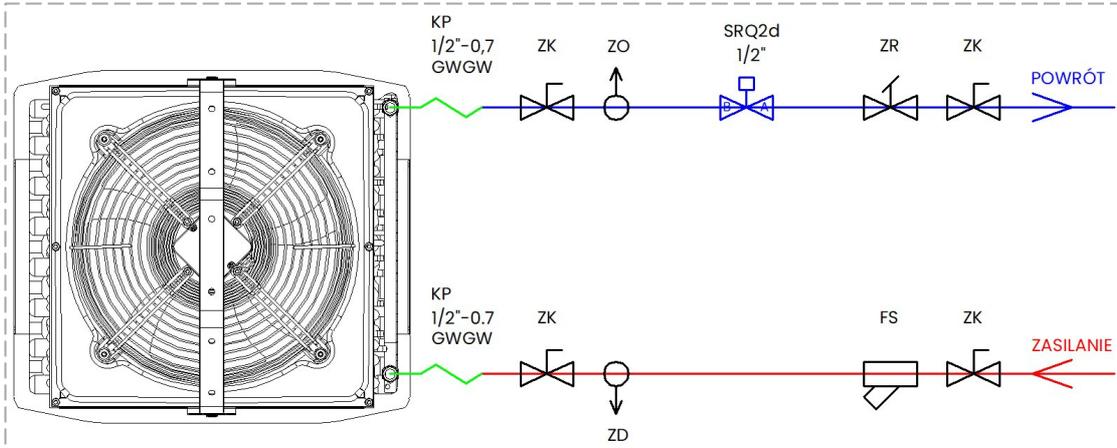
| Device | A dimension [mm] | B dimension [mm] |
|----------|------------------|------------------|
| LEO HD S | 414 | 414 |
| LEO HD L | 516 | 516 |

6. Connecting the hydraulic system

6.1. Hydraulic diagrams

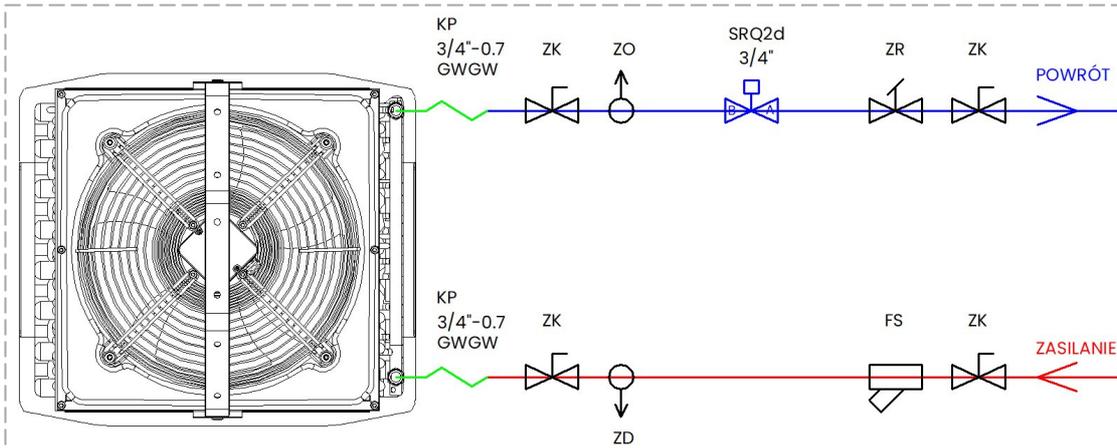
WARNING  The diagrams presented below are examples only. The installation designer decides on the final shape and the use of individual elements.

6.1.1. Two-way valve SRQ2D 1/2"



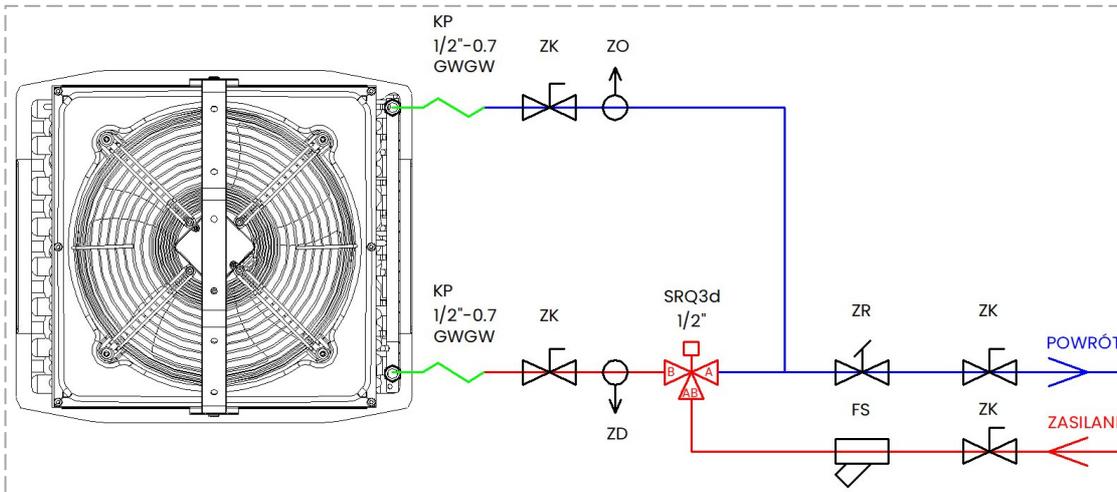
ZK—shut-off valve; **ZO**—vent valve; **ZD**—drain valve; **FS**—mesh filter; **ZR**—balancing valve;
KP—flexible metal hose; **SRQ2d**—two-way valve with on/off actuator

6.1.2. Two-way valve SRQ2D 3/4"



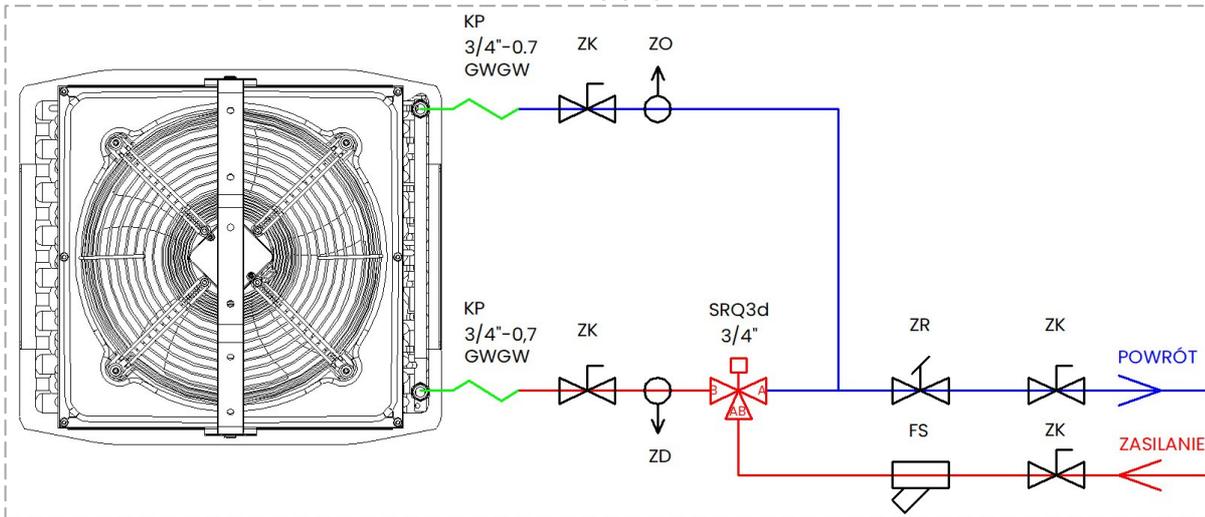
ZK—shut-off valve; **ZO**—vent valve; **ZD**—drain valve; **FS**—mesh filter; **ZR**—balancing valve;
KP—flexible metal hose; **SRQ2d**—two-way valve with on/off actuator

6.1.3. Three-way valve SRQ3D 1/2" supply installation



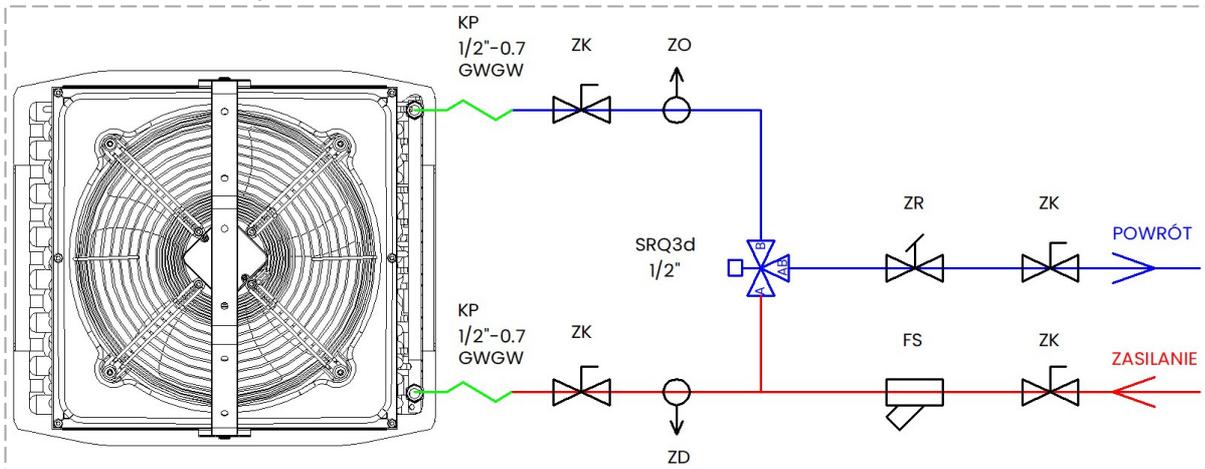
ZK—shut-off valve; **ZO**—vent valve; **ZD**—drain valve; **FS**—mesh filter; **ZR**—balancing valve;
KP—flexible metal hose; **SRQ3d**—three-way valve with on/off actuator

6.1.4. Three-way valve SQR3D 3/4" supply installation



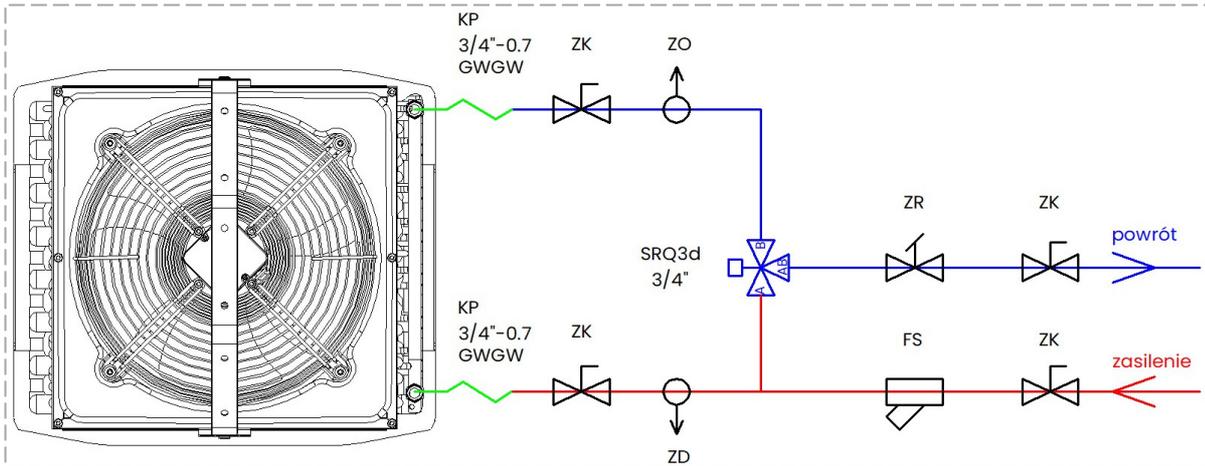
ZK–shut-off valve; **ZO**–vent valve; **ZD**–drain valve; **FS**–mesh filter; **ZR**–balancing valve;
KP–flexible metal hose; **SRQ3d**–three-way valve with on/off actuator

6.1.5. Three-way valve SRQ3D 1/2" return installation



ZK–shut-off valve; **ZO**–vent valve; **ZD**–drain valve; **FS**–mesh filter; **ZR**–balancing valve;
KP–flexible metal hose; **SRQ3d**–three-way valve with on/off actuator

6.1.6. Three-way valve SRQ3D 3/4" return installation



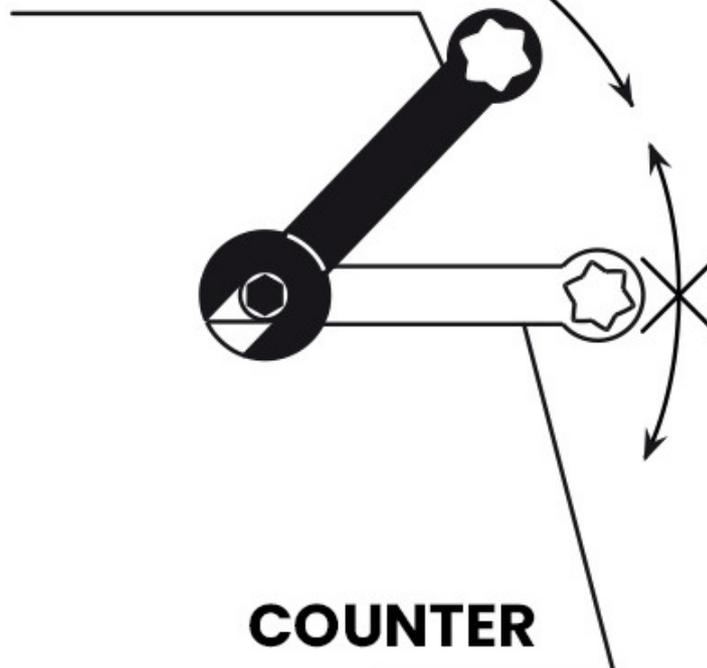
ZK–shut-off valve; **ZO**–vent valve; **ZD**–drain valve; **FS**–mesh filter; **ZR**–balancing valve;
KP–flexible metal hose; **SRQ3d**–three-way valve with on/off actuator

6.2. Notes on hydraulic connections

- Disconnect the heater power supply before connecting the water system.
- The connection should be made without stress. It is recommended to use flexible ducts supplying the heating medium.
- Water supply should be connected to the connector marked with red arrow.
- The installation with the heating medium must be protected against the increase of the heating medium pressure above the permissible value (1.6 MPa).
- Before starting the device, check the correct connection of the heating medium and the system for leaks.
- During assembly of the installation it is absolutely necessary to immobilize the exchanger's connector pipes.

WARNING 

TIGHTEN



COUNTER

- After filling the system with heating medium, check the tightness of the hydraulic connections.
- It is recommended to use bleeding/air release valves at the highest point of the installation.
- In the event that the water from the device is drained for a longer period of time, the exchanger tubes should be blown and dried with compressed air.
- Installation should be carried out in such a way that in the event of a failure it is possible to dismantle the device (use of flexible hoses is recommended). For this purpose, use shut-off valves next to the device.

ADVICE 

6.3. Heating medium parameters

- The water heat exchanger can be supplied with water or glycol solutions up to 60%.
- The heat exchanger tubes are made of copper, so heating medium should not cause corrosion of this material.
- In particular, the parameters as below should be provided:



| Parameter | Value |
|-------------------------------|--------------------------------------|
| pH | 7,5-9,0 |
| Pollution | Free of sediments/particles |
| Total hardness | $[Ca^{2+}, Mg^{2+}]/[HCO_3^-] > 0.5$ |
| Oil and grease | <1 mg/l |
| Oxygen | <0.1mg/l |
| HCO ₃ ⁻ | 60-300 mg/l |
| Ammonia | < 1.0 mg/l |
| Sulphides | < 0.05 mg/l |
| Chlorides, Cl | <100 mg/l |

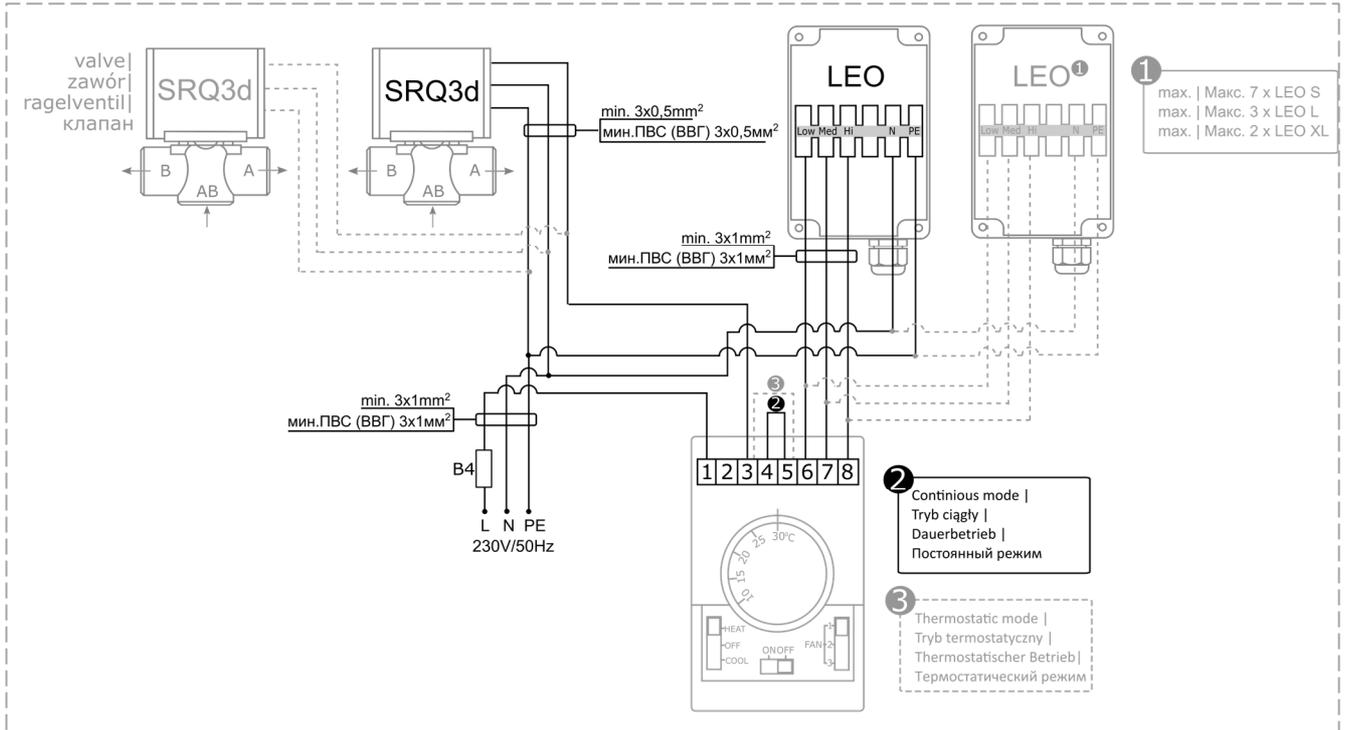
6.4. Heating power tables

| | | T _{w1} /T _{w2} = 45/35 [°C] | | | | | T _{w1} /T _{w2} = 70/50 [°C] | | | | | T _{w1} /T _{w2} = 55/45 [°C] | | | | |
|--------------------|----------|---|---------|----------|----------|-----------|---|----------|----------|-----------|---------|---|----------|-----------|--|--|
| | Tp1 [°C] | V [m³/h] | PT [kW] | Tp2 [°C] | Qw [l/h] | Δpw [kPa] | PT [kW] | Tp2 [°C] | Qw [l/h] | Δpw [kPa] | PT [kW] | Tp2 [°C] | Qw [l/h] | Δpw [kPa] | | |
| LEO HD S EC | 10 | 1650 | 6,3 | 21,5 | 550 | 6,9 | 10,4 | 29,0 | 454 | 4,5 | 8,7 | 26,0 | 760 | 11,9 | | |
| | | 1300 | 5,5 | 22,5 | 477 | 5,4 | 9,2 | 31,0 | 401 | 3,6 | 7,7 | 27,5 | 671 | 9,5 | | |
| | | 950 | 4,5 | 24,0 | 392 | 3,8 | 7,6 | 33,5 | 330 | 2,6 | 6,3 | 29,5 | 552 | 6,7 | | |
| | | 600 | 3,3 | 26,5 | 289 | 2,2 | 5,6 | 37,5 | 244 | 1,5 | 4,7 | 33,0 | 407 | 3,9 | | |
| | 15 | 1650 | 5,1 | 24,0 | 446 | 4,8 | 9,2 | 32,0 | 403 | 3,7 | 7,6 | 29,0 | 660 | 9,2 | | |
| | | 1300 | 4,5 | 25,0 | 386 | 3,7 | 8,2 | 33,5 | 357 | 3,0 | 6,7 | 30,0 | 582 | 7,4 | | |
| | | 950 | 3,7 | 26,5 | 317 | 2,6 | 6,7 | 36,0 | 293 | 2,1 | 5,5 | 32,0 | 479 | 5,2 | | |
| | | 600 | 2,7 | 28,0 | 234 | 1,5 | 5,0 | 39,0 | 217 | 1,2 | 4,1 | 36,5 | 354 | 3,0 | | |
| | 20 | 1650 | 3,9 | 27,0 | 339 | 3,0 | 8,1 | 35,0 | 352 | 2,9 | 6,4 | 32,0 | 558 | 6,8 | | |
| | | 1300 | 3,4 | 27,5 | 294 | 2,3 | 7,1 | 36,0 | 311 | 2,3 | 5,7 | 33,0 | 493 | 5,5 | | |
| | | 950 | 2,8 | 28,5 | 241 | 1,6 | 5,9 | 38,0 | 256 | 1,7 | 4,7 | 34,5 | 405 | 3,9 | | |
| | | 600 | 2,0 | 30,0 | 176 | 0,9 | 4,3 | 41,0 | 189 | 1,0 | 3,5 | 36,5 | 299 | 2,3 | | |
| LEO HD S AC | 10 | 2000 | 7,1 | 20,5 | 615 | 8,5 | 11,8 | 27,5 | 517 | 5,7 | 9,9 | 24,5 | 867 | 15,0 | | |
| | | 1600 | 6,2 | 21,5 | 540 | 6,7 | 10,4 | 29,0 | 454 | 4,5 | 8,7 | 26,0 | 760 | 11,9 | | |
| | | 1250 | 5,4 | 22,5 | 465 | 5,2 | 9,0 | 31,0 | 392 | 3,5 | 7,5 | 28,0 | 655 | 9,1 | | |
| | 15 | 2000 | 5,7 | 23,5 | 499 | 5,8 | 10,5 | 30,5 | 459 | 4,6 | 8,6 | 27,5 | 752 | 11,6 | | |
| | | 1600 | 5,0 | 24,5 | 437 | 4,6 | 9,2 | 32,0 | 403 | 3,7 | 7,6 | 29,0 | 660 | 9,2 | | |
| | | 1250 | 4,3 | 25,5 | 377 | 3,6 | 8,0 | 34,0 | 348 | 2,8 | 6,5 | 30,5 | 569 | 7,0 | | |
| | 20 | 2000 | 4,4 | 26,5 | 380 | 3,6 | 9,2 | 33,5 | 401 | 3,6 | 7,3 | 30,5 | 636 | 8,6 | | |
| | | 1600 | 3,8 | 27,0 | 333 | 2,9 | 8,1 | 35,0 | 352 | 2,9 | 6,4 | 32,0 | 558 | 6,8 | | |
| | | 1250 | 3,3 | 28,0 | 287 | 2,2 | 7,0 | 36,5 | 304 | 2,2 | 5,5 | 33,0 | 481 | 5,2 | | |

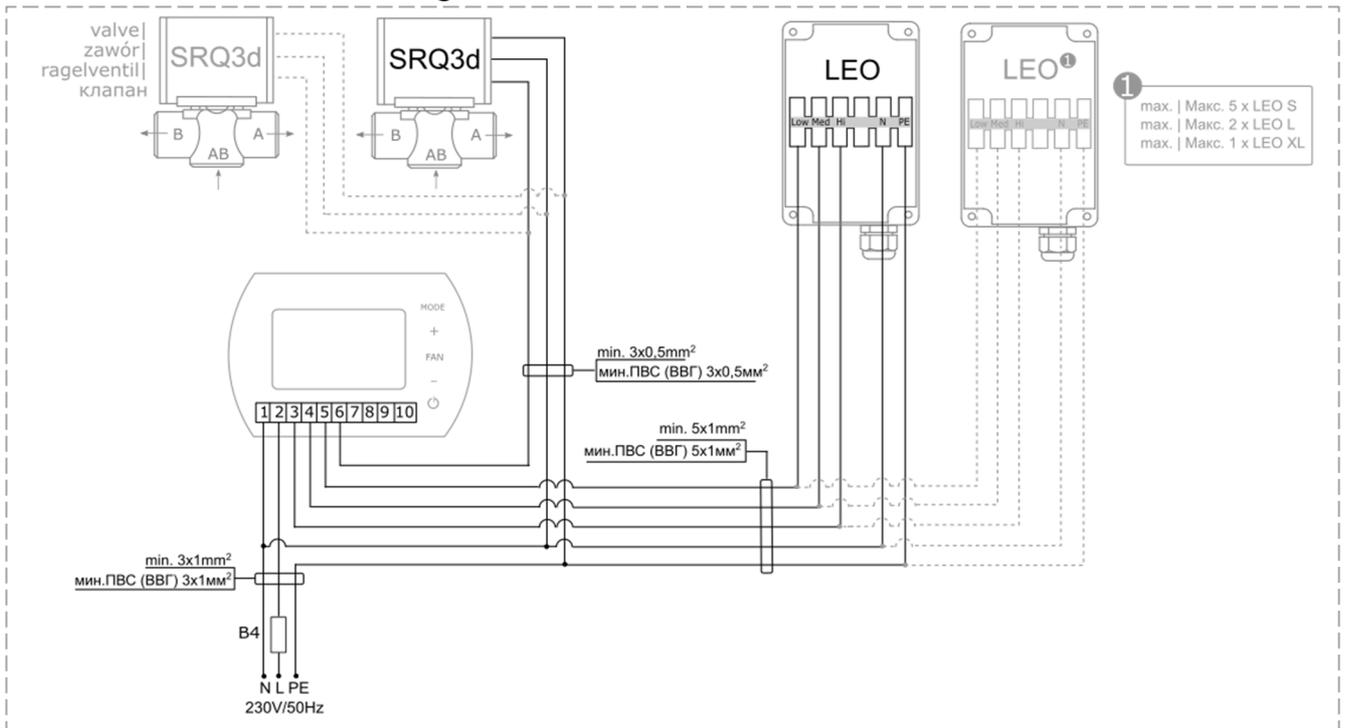
| | | Twi/Tw2 = 45/35 [°C] | | | | | Twi/Tw2 = 70/50 [°C] | | | | | Twi/Tw2 = 55/45 [°C] | | | | |
|--------------------|-------------------------|----------------------|------------|-------------|-------------|--------------|----------------------|-------------|-------------|--------------|------------|----------------------|-------------|--------------|------|--|
| | Tp1 [°C] | V [m³/h] | PT [kW] | Tp2 [°C] | Qw [l/h] | Δpw [kPa] | PT [kW] | Tp2 [°C] | Qw [l/h] | Δpw [kPa] | PT [kW] | Tp2 [°C] | Qw [l/h] | Δpw [kPa] | | |
| LEO HD L EC | 10 | 3000 | 12,2 | 22,0 | 1063 | 5,2 | 20,5 | 30,0 | 895 | 3,5 | 17,4 | 27,0 | 1517 | 9,5 | | |
| | | 2750 | 11,6 | 22,5 | 1009 | 4,7 | 19,4 | 31,0 | 849 | 3,2 | 16,5 | 28,0 | 1439 | 8,6 | | |
| | | 1850 | 9,0 | 24,5 | 785 | 3,0 | 15,1 | 34,0 | 662 | 2,1 | 12,8 | 30,5 | 1119 | 5,5 | | |
| | | 950 | 5,7 | 28,0 | 495 | 1,3 | 9,6 | 40,0 | 419 | 0,9 | 8,1 | 35,5 | 708 | 2,4 | | |
| | 15 | 3000 | 9,8 | 24,5 | 854 | 3,5 | 18,1 | 33,0 | 792 | 2,8 | 15,0 | 30,0 | 1311 | 7,3 | | |
| | | 2750 | 9,3 | 25,0 | 810 | 3,2 | 17,2 | 33,5 | 752 | 2,6 | 14,3 | 30,5 | 1244 | 6,6 | | |
| | | 1850 | 7,3 | 26,5 | 630 | 2,1 | 13,4 | 36,5 | 586 | 1,7 | 11,1 | 32,5 | 968 | 4,2 | | |
| | | 950 | 4,6 | 29,0 | 395 | 0,9 | 8,5 | 41,0 | 371 | 0,7 | 7,0 | 36,5 | 612 | 1,9 | | |
| | 20 | 3000 | 7,4 | 27,5 | 641 | 2,1 | 15,7 | 35,5 | 688 | 2,2 | 12,7 | 32,5 | 1103 | 5,3 | | |
| | | 2750 | 7,0 | 27,5 | 608 | 1,9 | 14,9 | 36,0 | 653 | 2,0 | 12,0 | 33,0 | 1047 | 4,9 | | |
| | | 1850 | 5,4 | 28,5 | 470 | 1,2 | 11,6 | 38,5 | 509 | 1,3 | 9,4 | 35,0 | 815 | 3,1 | | |
| | | 950 | 3,3 | 30,5 | 289 | 0,5 | 7,3 | 42,5 | 321 | 0,6 | 5,9 | 38,0 | 516 | 1,4 | | |
| LEO HD L AC | 10 | 3800 | 14,1 | 21,0 | 1224 | 6,7 | 23,5 | 28,5 | 1030 | 4,5 | 20,0 | 25,5 | 1747 | 12,2 | | |
| | | 2400 | 10,7 | 23,0 | 927 | 4,1 | 17,9 | 32,0 | 781 | 2,8 | 15,2 | 28,5 | 1322 | 7,4 | | |
| | | 1400 | 7,5 | 26,0 | 651 | 2,2 | 12,6 | 36,5 | 550 | 1,5 | 10,7 | 32,5 | 929 | 3,9 | | |
| | 15 | 3800 | 11,3 | 24,0 | 983 | 4,5 | 20,8 | 31,0 | 911 | 3,6 | 17,3 | 28,5 | 1509 | 9,4 | | |
| | | 2400 | 8,6 | 25,5 | 745 | 2,8 | 15,8 | 34,5 | 691 | 2,2 | 13,1 | 31,0 | 1143 | 5,7 | | |
| | | 1400 | 6,0 | 27,5 | 522 | 1,5 | 11,1 | 38,5 | 487 | 1,2 | 9,2 | 34,5 | 804 | 3,0 | | |
| | 20 | 3800 | 8,5 | 26,5 | 738 | 2,7 | 18,1 | 34,0 | 791 | 2,8 | 14,6 | 31,5 | 1270 | 6,9 | | |
| | | 2400 | 6,4 | 28,0 | 558 | 1,7 | 13,7 | 36,5 | 600 | 1,7 | 11,0 | 33,5 | 963 | 4,2 | | |
| | | 1400 | 4,5 | 29,5 | 388 | 0,9 | 9,7 | 40,0 | 422 | 0,9 | 7,8 | 36,0 | 677 | 2,2 | | |
| | LEO HD L AC IP66 | 10 | 3800 | 14,1 | 21,0 | 1224 | 6,7 | 23,5 | 28,5 | 1030 | 4,5 | 20,0 | 25,5 | 1747 | 12,2 | |
| | | | 3500 | 13,4 | 21,5 | 1166 | 6,1 | 22,4 | 29,0 | 981 | 4,2 | 19,1 | 26,0 | 1664 | 11,2 | |
| | | | 2930 | 12,1 | 22,0 | 1049 | 5,1 | 20,2 | 30,5 | 883 | 3,5 | 17,2 | 27,5 | 1496 | 9,2 | |
| 2300 | | | 10,4 | 23,5 | 902 | 3,9 | 17,4 | 32,5 | 761 | 2,6 | 14,8 | 29,0 | 1287 | 7,0 | | |
| 1400 | | | 7,5 | 26,0 | 651 | 2,2 | 12,6 | 36,5 | 550 | 1,5 | 10,7 | 32,5 | 929 | 3,9 | | |
| 15 | | 3800 | 11,3 | 24,0 | 983 | 4,5 | 20,8 | 31,0 | 911 | 3,6 | 17,3 | 28,5 | 1509 | 9,4 | | |
| | | 3500 | 10,8 | 24,0 | 937 | 4,2 | 19,8 | 31,5 | 868 | 3,3 | 16,5 | 29,0 | 1438 | 8,6 | | |
| | | 2930 | 9,7 | 25,0 | 842 | 3,4 | 17,9 | 33,0 | 781 | 2,8 | 14,8 | 30,0 | 1293 | 7,1 | | |
| | | 2300 | 8,4 | 25,5 | 725 | 2,6 | 15,4 | 34,5 | 673 | 2,1 | 12,8 | 31,5 | 1113 | 5,4 | | |
| 20 | | 1400 | 6,0 | 27,5 | 522 | 1,5 | 11,1 | 38,5 | 487 | 1,2 | 9,2 | 34,5 | 804 | 3,0 | | |
| | | 3800 | 8,5 | 26,5 | 738 | 2,7 | 18,1 | 34,0 | 791 | 2,8 | 14,6 | 31,5 | 1270 | 6,9 | | |
| | | 3500 | 8,1 | 27,0 | 703 | 2,5 | 17,2 | 34,5 | 753 | 2,6 | 13,9 | 31,5 | 1210 | 6,3 | | |
| | 2930 | 7,3 | 27,5 | 632 | 2,1 | 15,5 | 35,5 | 678 | 2,2 | 12,5 | 32,5 | 1088 | 5,2 | | | |
| 20 | 2300 | 6,3 | 28,0 | 543 | 1,6 | 13,4 | 37,0 | 84 | 1,7 | 10,8 | 33,5 | 937 | 4,0 | | | |
| | 1400 | 4,5 | 29,5 | 388 | 0,9 | 9,7 | 40,0 | 422 | 0,9 | 7,8 | 36,0 | 677 | 2,2 | | | |

7. Electrical diagrams

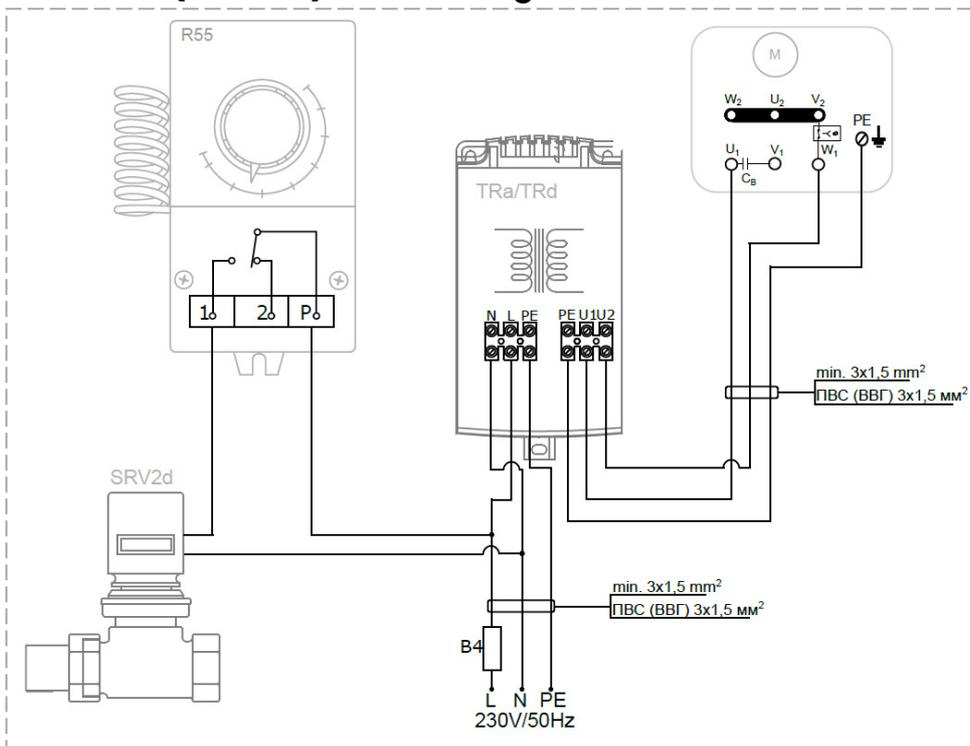
7.1. TS (AC) control diagram



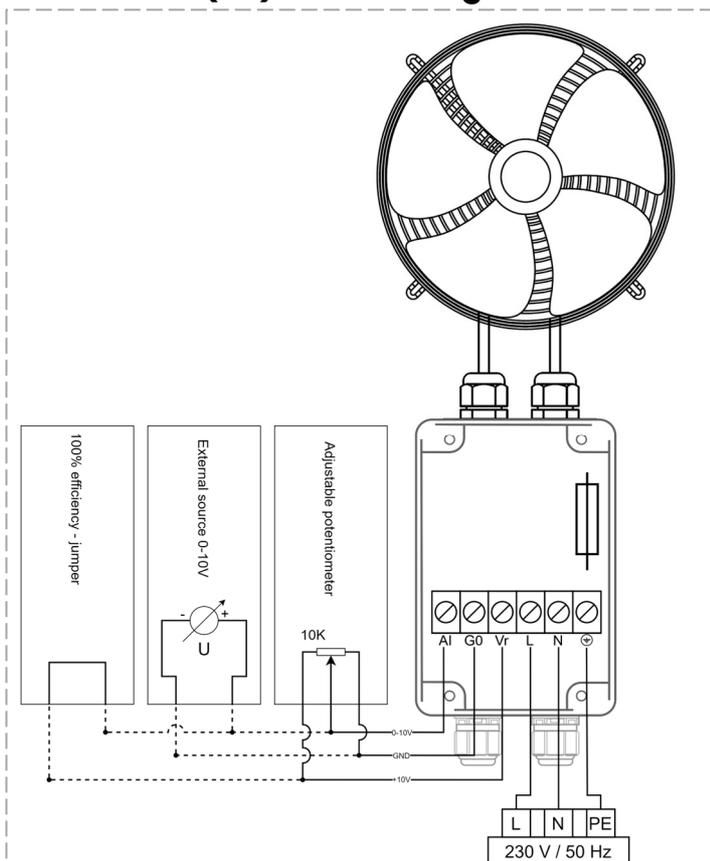
7.2. HMI (AC) control diagram



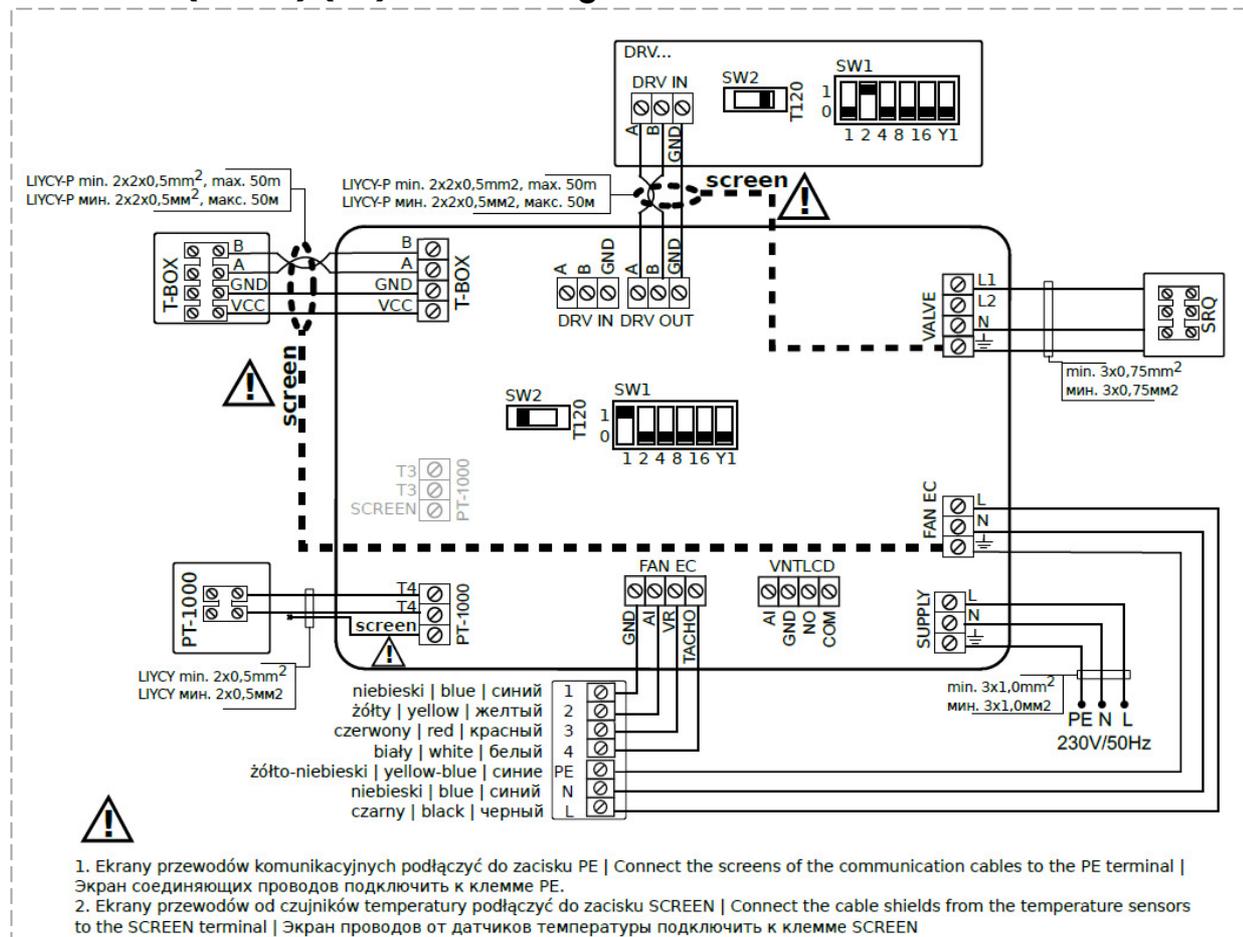
7.3. TRA (AC IP66) control diagram



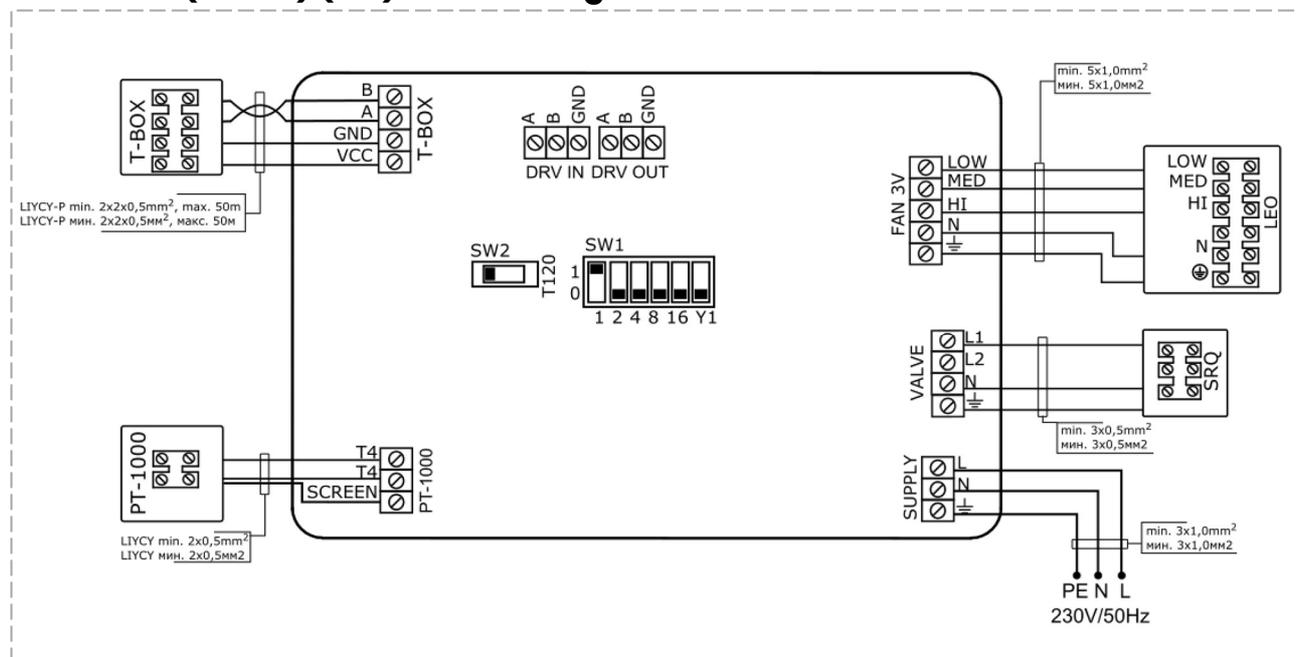
7.4. 0-10V (EC) control diagram



7.5. BMS (T-box) (EC) control diagram



7.6. BMS (T-box) (AC) control diagram



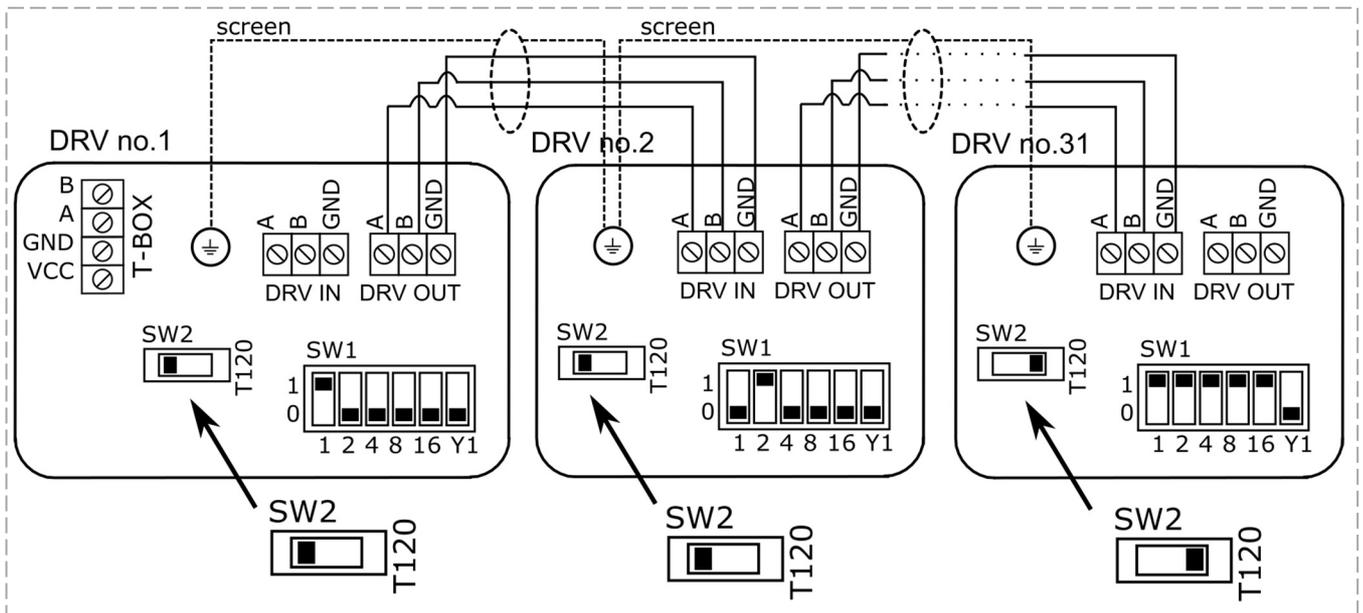
7.6.1. DRV module address set

It is necessary to set the binary address on DIP-switch SW1 when connecting DRV modules to the T-box controller or BMS system. Each DRV control module connected to the FLOWAIR SYSTEM must have assigned an individual address. To assign it, with the power off set the device address according to the table below. Next turn the power on.

| DRV no. | | | | | | |
|---------|---|---|---|---|----|----|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| ... | | | | | | |
| 31 | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | 1 | 2 | 4 | 8 | 16 | Y1 |

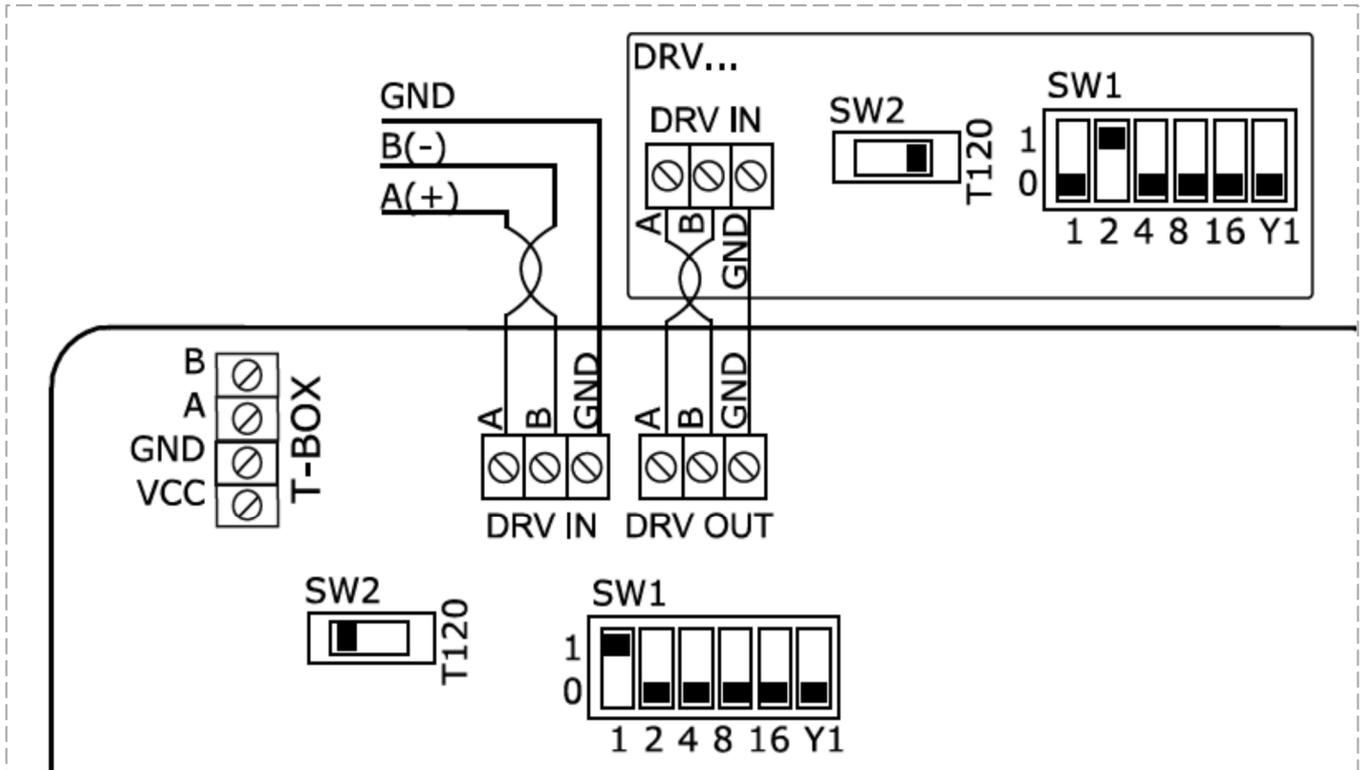
7.6.2. DRV modules junction

It is possible to connect up to 31 DRV modules. This allows you to operate up to 31 devices compatible with the FLOWAIR SYSTEM using one T-box controller. The connection diagram for multiple DRV modules is shown below.



7.6.3. BMS connection

The DRV module allows you to connect the system to the BMS (Building Management System). The connection should be made with a three-wire cable (UTP twisted pair recommended) to the DRV IN connectors (diagram below).



8. Start-up, operation and maintenance

8.1. Start-up



- Before connecting the power supply check the correctness of connection of the fan motor and the controllers. These connections should be executed in accordance with their technical documentation.
- Before connecting the power supply check whether the mains voltage is in accordance with the voltage on the device data plate.
- Before starting the device check the correctness of connection of the heating medium conduits and the tightness of the system.
- The electrical system supplying the fan motor should be additionally protected with a circuit breaker against the effects of a possible short-circuit in the system.
- Starting the device without connecting the ground conductor is forbidden.

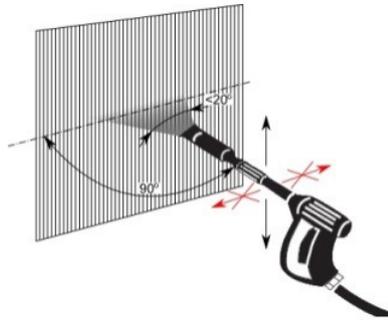
8.2. Operation



- The device is designed for operation inside buildings, at temperatures above 0°C. In low temperatures (below 0°C) there is a danger of freezing of the medium.
- **The manufacturer bears no responsibility for damage of the heat exchanger resulting from freezing of the medium in the exchanger. If operation of the device is expected at temperatures lower than 0°, then glycol solution should be used as the heating medium, or special automatic systems should be used for protecting against freezing of the medium in the exchanger.**
- It is forbidden to place any objects on the heater or to hang any objects on the connecting stubs.
- The device must be inspected periodically. In the case of incorrect operation of the device it should be switched off immediately.
- **It is forbidden to use a damaged device. The manufacturer bears no responsibility for damage resulting from the use of a damaged device.**
- If it is necessary to clean the exchanger, be careful not to damage the aluminum lamellas.
- For the time of performing inspection or cleaning the device, the electrical power supply should be disconnected.
- In case water is drained from the device for a longer period of time, the exchanger tubes should be emptied with compressed air.
- It is not allowed to make any modification in the unit. Any modification causes in warranty loss.

8.3. Periodic inspections

- To keep proper technical parameters Flowair recommends periodic service (every 6 months) of fan heaters on behalf of the user.
- Check heat exchanger, if is it filled with dirt or dust. If necessary - use pressurized air stream to clean the exchanger's lamellas,



WARNING



- Check heat exchanger, if is it filled with dirt or dust. If necessary - use pressurized air stream to clean the exchanger's lamellas,
- Check fan blades, in case of dirt use damp cloth and remove dirt,
- Check bracket installation,
- Check heat exchanger and hydraulic connection correctness,
- Check wires insulation,
- Check power supply,
- Check medium flow,
- Check levelling of the unit.

9. Conformity with WEEE directive 2012/19/UE

Running a business without harming the environment and observing the rules of proper handling of waste electrical and electronic equipment is a priority for FLOWAIR.

The symbol of the crossed out wheeled bin placed on the equipment, packaging or documents attached means that the product must not be disposed of with other wastes.

It is the responsibility of the user to hand the used equipment to a designated collection point for proper processing. The symbol means that the equipment was placed on the market after August 13, 2005.



For information regarding recycling of waste electrical and electronic equipment, please contact your local distributor.

REMEMBER:

Do not dispose of used equipment together with other waste! There are financial penalties for this. Proper handling of used equipment prevents potential negative consequences for the environment and human health. At the same time, we save the Earth's natural resources, reusing resources obtained from the processing of equipment.

10. Service and warranty terms

Please contact your dealer in order to get familiar 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 authorized for this, and for damage resulting from this!

Made in Poland

Made in EU

Manufacturer: FLOWAIR GŁOGOWSKI I BRZEZIŃSKI SP. z O.O.

ul. Chwaszczyńska 135, 81-571 Gdynia

tel. +48 58 669 82 20, fax: +48 58 627 57 21

e-mail: info@flowair.pl

www.flowair.com

11. Declaration of Conformity

④ **FLOWAIR SP. Z O.O.**

Chwaszczyńska 135, 81-571 Gdynia

e-mail: info@flowair.pl www.flowair.com



③ 29.01.2024

① Water heaters

② LEO HD S, LEO HD L;



| | |
|-------------------------------------|-----------|
| DECLARATION OF CONFORMITY UE | EN |
|-------------------------------------|-----------|

④ FLOWAIR hereby confirms that fan heaters:

- ② LEO HD S EC, LEO HD S AC
- LEO HD L EC, LEO HD L AC, LEO HD L AC IP66

⑤ were produced in accordance to the following Europeans Directives:

4. **2014/30/UE** Electromagnetic Compatibility (EMC)
5. **2006/42/WE** Machinery
6. **2014/35/UE** Low Voltage Electrical Equipment (LVD)

⑥ and harmonized norms, with above directives:

PN-EN ISO 12100:2012 Safety Of Machinery - General Principles For Design - Risk Assessment And Risk Reduction

PN-EN 60335-1:2012 Household and similar electrical appliances - Safety - Part 1: General requirements

PN-EN 60335-2-30:2010 Household and similar electrical appliances - Safety - Part 2-30: Particular requirements for room heaters

PN-EN 61000-6-2:2008 Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments

③ 29.01.2024

⑦ Mateusz Piasecki
Product Manager