

casestudy book



About company

FLOWAIR is an expert in heating and ventilation of areas with medium and big cubatures. We are the manufacturer of fan heaters, air curtains, air curtain–fan heaters combo and heat recovery. In addition, we are the exclusive distributor in Poland of gas heaters made by Italian company Robur.

The offer consists of three groups of products:

- air heating (fan heaters, gas heaters, electric fan heaters and heaters dedicated for farms and other agricultural purposes)
- ductless ventilation (mixing chambers combined with fan heaters and heat recovery units)
- air curtains and air curtain–fan heater combo.

In our activity we place special emphasis on innovative projects with regard to industrial design. Industrial design allows us from the beginning to think about the needs that stand behind the product, its design, materials and way of using, and thus, allows to bring in the innovation.

FLOWAIR not only focuses on the aesthetics of manufactured equipment, but primarily on the benefits that the product have to carry, its ergonomics and functional solutions and technology that will fit the user's needs. This is how we understand the concept of industrial design.

Our cooperation with industrial designers has resulted in the first fan heater made of ABS plastic and the first air curtain–fan heater combo which combining two functions (air curtain and fan heater) in the exciting, elliptical casing. In 2013 we introduced a unit that has revolutionized the market of ventilation – OXeN heat recovery unit. This product combines innovative technology with an interesting design. Compact, independent, ductless unit has the casing with the unique character made of lightweight EPP material which is highly durable and have excellent acoustic and thermal insulation.

Our projects have been awarded in a number of prestigious international competitions in the field of design like The RedDot Design Award, The iF Product Design Award and Good Design organized by the Polish Institute of Industrial Design.



reddot award 2014
winner



product
design award

2014 ■





Why we created a case study book?

The case study book presents a collection of case studies, where the products from FLOWAIR offer have been used. Selection of the products was prepared in cooperation with our Project Department. Contacting with us you can count on our help in consulting and selection of heating and ventilation equipment.

On the following pages you will find the examples of a case studies.

We invite you to read.



Product offer

Fan heater

- **LEO FB** – common use, neutral environment (stores, halls)
- **LEO FL** – aesthetic, elegant buildings (car salons, churches)
- **LEO FS** – small areas (pubs, restaurants)
- **LEO D** – high halls
- **LEO EL** – fan heater with electrical heat exchanger
- **LEO AGRO** – (chicken farms, swine farms, car washes)



Ventilation

- **OXeN** – halls, stores which require ventilation with high heat recovery level
- **LEO KMFB** – halls, stores which not require ventilation with high heat recovery level
- **LEO KMFS** – aesthetic, elegant buildings which not require ventilation with heat recovery

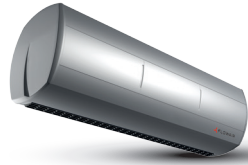


Air curtains

- **ELiS G** – industrial gates
- **ELiS A** – aesthetic, elegant buildings (car salons, churches)
- **ELiS DUO** – aesthetic, elegant small buildings (gas station, small shops)
- **ELiS T** – common use, neutral environment (stores, halls)



System FLOWAIR



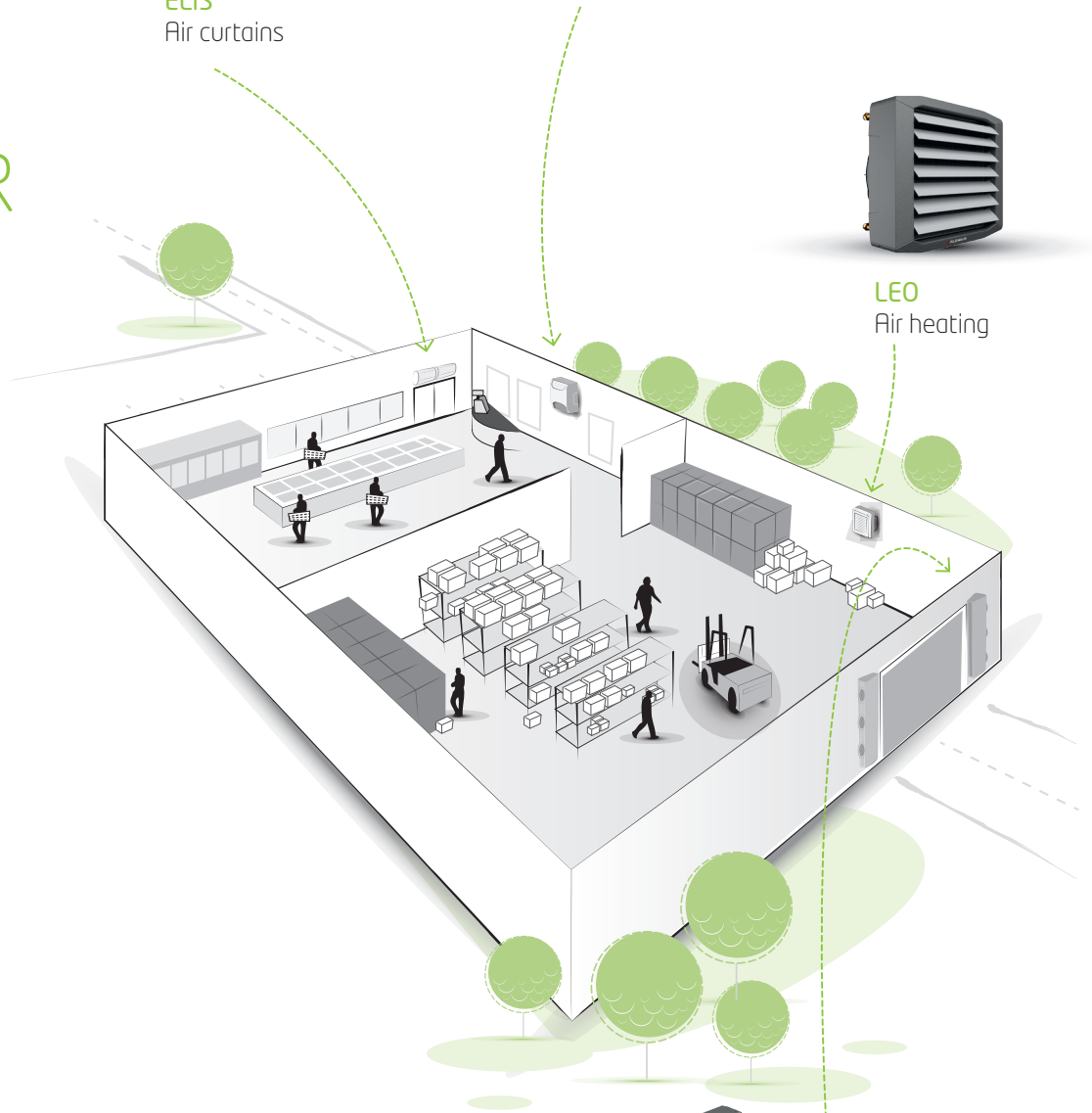
ELiS
Air curtains



OXeN
Ventilation
with heat recovery

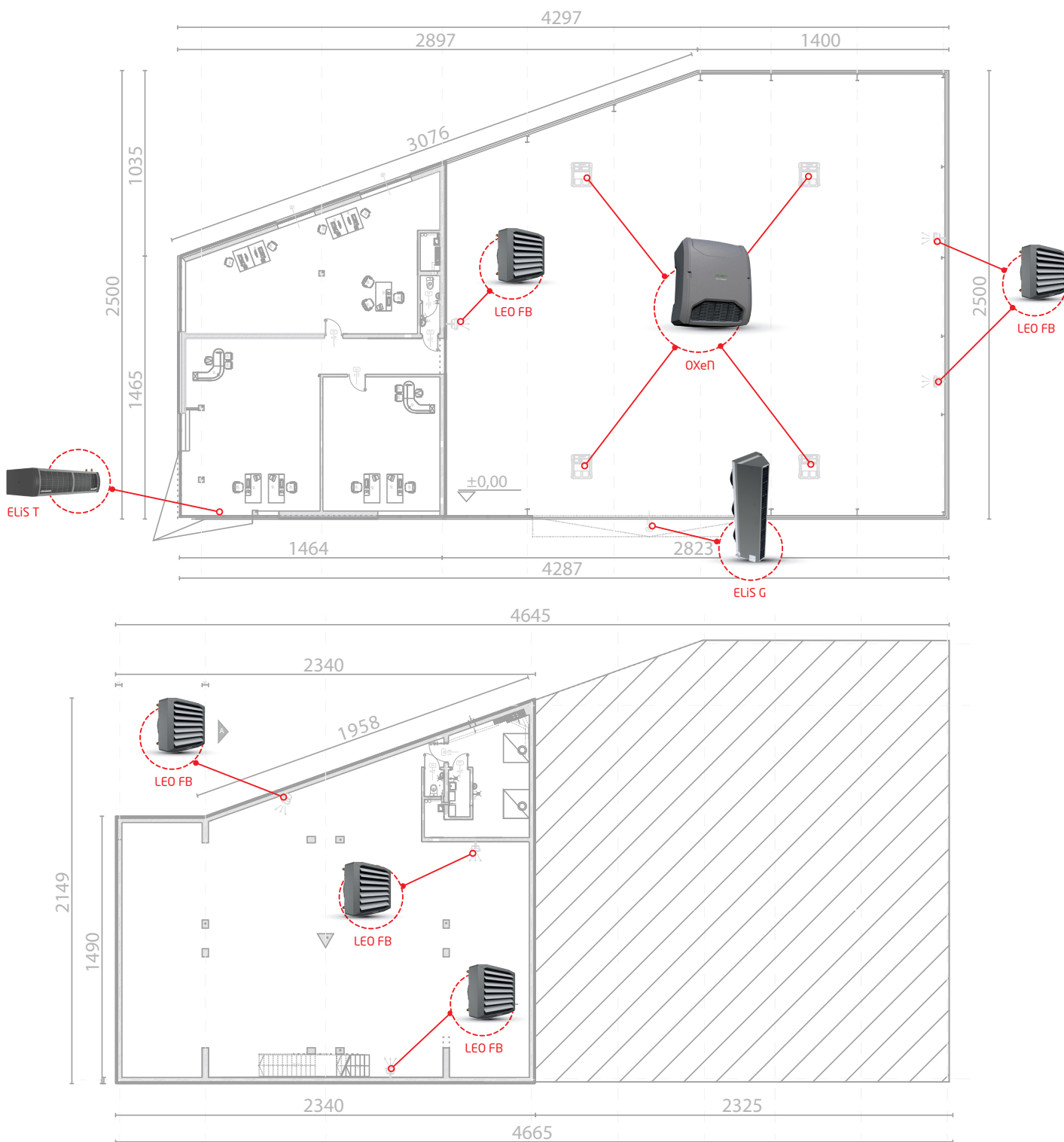


LEO
Air heating



ELiS G
Industrial
curtains

Case no. 1



Used units:

Ventilation



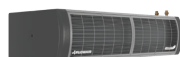
OXeN
(heat recovery units)

Heating



LEO FB
(fan heaters)

Air curtains



ELIS T
(air curtains)



ELIS G
(industrial air curtains)

Office and storage building with parking hall and landing for helicopters



Choczno
Lesser Poland Voivodeship

Customer needs:

providing heating and ventilation at several levels of the building. Client wanted an economical, complete and easy to use the system. Equipment should be matched to the existing facade inside the building.

General project assumptions:

- heating medium parameters: 70/50°C (propylene glycol 35%),
- ambient temperature: -20°C,
- thermal insulation: very good.

Project assumptions – parking hall:

- temperature inside the parking hall: 12°C,
- heating capacity demand: 54 kW,
- ventilation of the hall: $V_{fr} = 5000 \text{ m}^3/\text{h}$ (ok. 1ex/h), so the ventilation loss is ca. 55 kW,
- PARKING HALL – heating capacity demand: 72,6 kW = (54 kW static losses + 55 kW ventilation – 36,4 kW recovered heat by OXeN units).

Project assumptions – storage:

- inside temperature: 16°C,
- heating capacity demand: 29 kW.

Equipment selection proposal:

Parking hall – OXeN ventilation units with heat recovery, LEO FB water heaters, ELiS G and T air curtains with water exchanger

- > 4 pcs. of OXeN X2-N-1.2-H ventilation units with heat recovery installed under the ceiling;

OXeN heat recovery capacity:

$Q_{1pc} = 4 \times 9,1 = 36,4 \text{ kW}$ of recovered energy from used air – savings made by 4 pcs. of OXeN heat recovery units.

$V_{sup/ex \text{ max.}} = 4 \times 1250 = 5000 \text{ m}^3/\text{h}$, ventilation volume (inlet and outlet ensured by OXeN heat recovery units), air stream can be adjusted in the range from 0 to 100%; (installed EU3 filter instead of EU4 filter to increase air volume from OXeN units efficiency from 1200 m³/h to 1250 m³/h);

- > 3 pcs. of LEO FB 45M fan heaters
 $Q_c = 3 \times 25,2 = 75,6 \text{ kW}$;
Total heating capacity: 75,6 kW

- > 5 pcs. of ELiS G1-N-200 + 2 pcs. of ELiS G1-N-150
Proposed gate curtains installed above the opening with total length 13,0 m.

Storage
– LEO FB fan heaters

- > 2 pcs. of LEO FB 15M fan heaters
 $Q_c = 2 \times 8,4 = 16,8 \text{ kW}$;

- > 1 pcs. of LEO FB 30M fan heater
 $Q_c = 1 \times 13,6 = 13,6 \text{ kW}$;

Total heating capacity: 30,4 kW.

Office part – entrance
– ELiS T door curtain

- > 1 pcs. of ELiS T2-W-150/L
Proposed door curtain installed above the door with total length of air outlet gap 1,5 m.

Description of the installation and reasons of choosing:

Object in Choczno is a multilevel office and storage building with landing for helicopters. Depending on the level of the building we proposed a various types of heating or ventilation.

Parking hall part

In the parking hall part we proposed OXeN heat recovery units in version without heat exchanger – so-called “cold”, which provide ventilation in this part of the object. The project does not allow installation of an integrated air intake and exhaust on the concrete wall so Flowair proposed units operating under the ceiling.

- ✓ Advantages of OXeN unit are:

lower operating costs thanks to heat recovery (approx. **890 €** per year saved by 4 pcs. of OXeN). Lower demand for heating capacity and lower power consumption,

- no need of using an exhaust fans (OXeN unit ensures supplying and exhausting ventilation), no need of ducts installation,
- unit is equipped with complete control system. Easy to use T-box touch panel enables to connect to the building management system,
- meet heat recovery law regulations.

To provide heating of the parking hall the LEO FB fan heaters were applied, which have light casing made of durable and resistant to dust material called EPP (expanded polypropylene).

Easy installation thanks to rotation console caused little interference with the existing facade of the building.

In addition, the selected units are in version with modulating motors. The EC fans (electronically commutated) used in these units enable energy savings of 40% per annum.

- ✓ Advantages of LEO FB unit are:

- durable and resistant to dust casing made of EPP (expanded polypropylene),
- easy installation thanks to rotation console,
- low weight of the unit – 13 kg.

Gates are secured by ELiS G air curtains with total length 13,0 m.

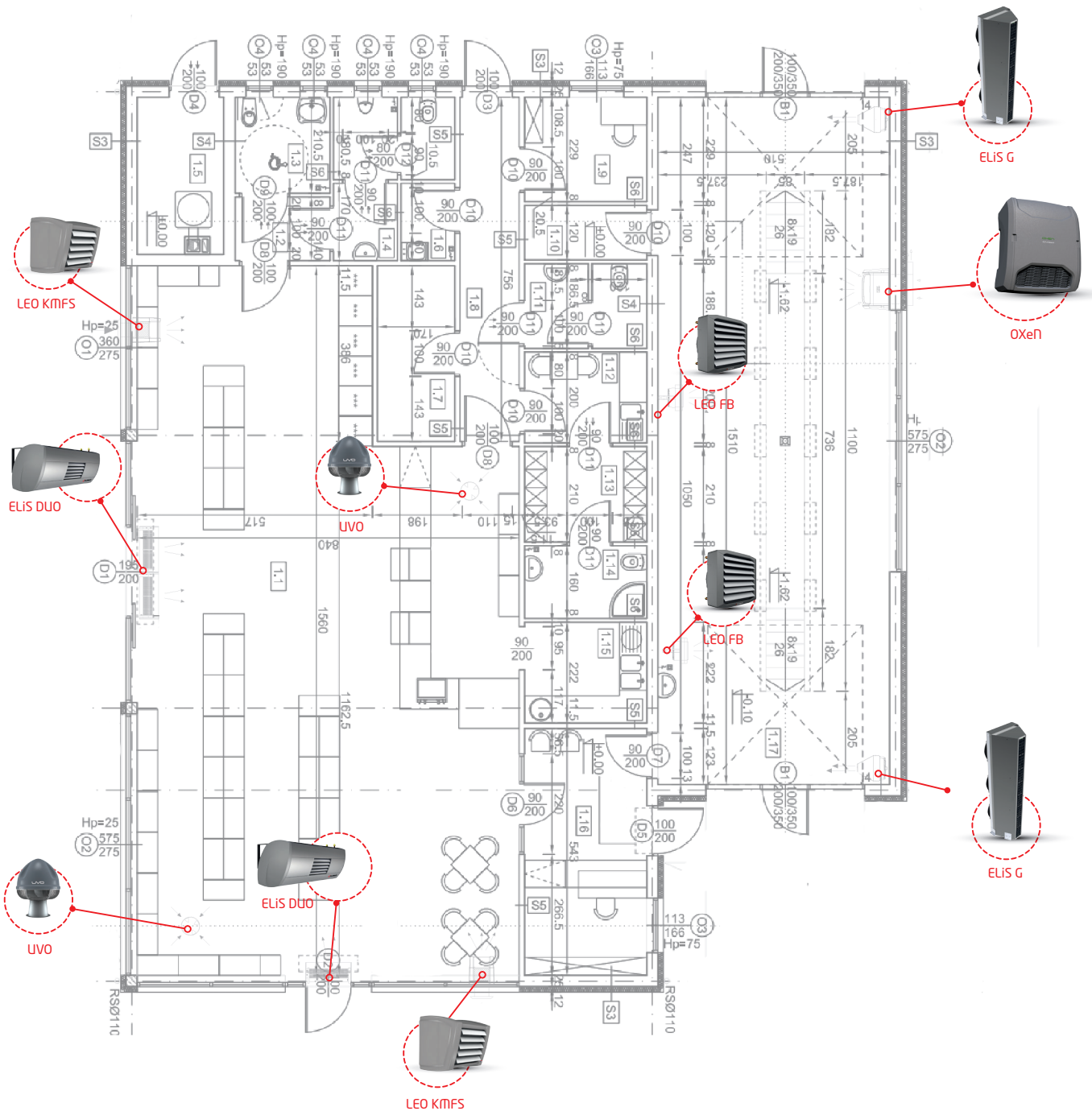
Storage part

To provide heating of the storage part the LEO FB water heaters in M version were applied. (Advantages of LEO FB are mentioned above).

Office part

To protect door openings against heat losses in winter and chill losses in summer, the universal ELiS T air curtains in standard version were applied.

Case no. 2



Used units:

Ventilation



OXeN
(heat recovery units)



LEO KMFS
(heating and ventilation units)



UVO
(roof fans)

Heating



LEO FB
(fan heaters)

Air curtains



ELIS DUO
(air curtain-fan heater combo)



ELIS G
(industrial air curtains)

Gas station building with vehicles diagnostic station

Customer needs:

Provide heating and ventilation of the sales room part and diagnostic station part. Due to central placement of the cash desks in the sales room part, installation of standard heating equipment could not take place. On the other hand in the diagnostic station ventilation had to be ensured and the heat losses associated with frequent gate opening had to be minimized.

General project assumptions:

- heating medium parameters: 70/50°C

Project assumptions:

- sales room,
- inside temperature: 20°C,
- height: about 3 m,
- ventilation: 1600 m³/h,
- approximate heating capacity demand: 32,0 kW (10,2 kW static losses + 21,8 kW ventilation).

Project assumptions:

- diagnostic station,
- inside temperature: 12°C,
- height: about 3,65 m,
- ventilation: 1460 m³/h,
- approximate heating capacity demand: 21,8 kW (5,9 kW static losses + 15,9 kW ventilation).

Equipment selection proposal:

Sales room

- 3 pcs. of ELiS DUO
air curtain-fan heater combo; heating capacity of fan heater part: 3x3,7 = 11,1 kW;
- 2 pcs. of LEO KMFS 15M
2x10,5 = 21,0 kW; 2x1150 = 2300 m³/h (1600 m³/h: 70% fresh air and 30% of recirculated air);
- 2 pcs. of UVO H1.4
2x1400 = 2800 m³/h, operating with LEO KMFS due to KTS control system and stepless speed regulator ensure proper air balance in the room.

Total heating capacity in the sales room:
11,1+21,0 = 32,1 kW.

Diagnostic station

- 1 pcs. of OXeN X2-W-1.2-V;
OXeN heating capacity:
17,0 kW (including heat recovery capacity 8,9 kW + water heat exchanger heating capacity 8 kW);

Vsup/ex max. = 1200 m³/h, ventilation air streams (air supplying and exhaust ensured by OXeN), air stream can be adjusted in range 0 to 100%.

- 2 pcs. of LEO FB.15M
2x7,4 = 14,8kW
- 2 pcs. of ELiS G1-N-200

Total heating capacity in the diagnostic station:
17,0 + 14,8 = 31,8 kW.

Description of the installation and reasons of choosing:

Sales room

In the sales part of the object to provide heating the ELiS DUO units were applied. Central placement of the cash desks replace standard heating system. ELiS DUO is an innovative unit combining the features of air curtain and fan heater. It provides two air streams. One protects the door opening against the heat losses while the other stream heats the room. Thanks ELiS DUO there is no need to install any additional heater and this resulted in saving more space for the shelves.

Advantages of ELiS DUO :

- modern desing suitable for objects with high level of aesthetics,
- high efficiency of heat exchange due to large surface of aluminum fins set on copper tubes,
- adjustable air blades ensures directing air stream,
- silent operation of the fans,
- control system ensures connection of the unit to the intelligent building management system BMS.

Additionally, to provide ventilation the LEO KMFS heating and ventilation units were applied. Their casings cover completely all of the hydraulic and electric connections and is suitable for the representative places like the sales room.

Advantages of LEO KMFS units:

- built-in mixing chamber supplying fresh air into the room,
- casing made of durable ABS plastic which covers hydraulic and electric connections,
- finishing elements made of anodized aluminum,
- integrated installation console ensures easy and quick installation.

To ensure proper balance between ventilating streams, the UVO roof fans were applied. Their task is to remove used air from the room. In combination with LEO KMFS heating and ventilation unit they form a complete mechanical ventilation system.

Diagnostic station

To ensure ventilation in the diagnostic station part the OXeN heat recovery unit with water heat exchanger was applied. In addition to the air exchange, OXeN ensures heating of the air in the building due to water heat exchanger

Advantages of OXeN unit are:

lower operating costs thanks to heat recovery (approx. 890 € per year saved by 4 pcs. of OXeN). Lower demand for heating capacity and lower power consumption,

- no need of using an exhaust fans (OXeN unit ensures mechanical ventilation), no need of air ducts installation,
- unit is equipped with complete control system. Easy to use T-box touch panel enables to connect to the central building management system BMS,
- meet heat recovery law regulations.

To complement the heating system the LEO FB fan heaters were applied, which have light casing made of durable and resistant to dust material called EPP (expanded polypropylene).

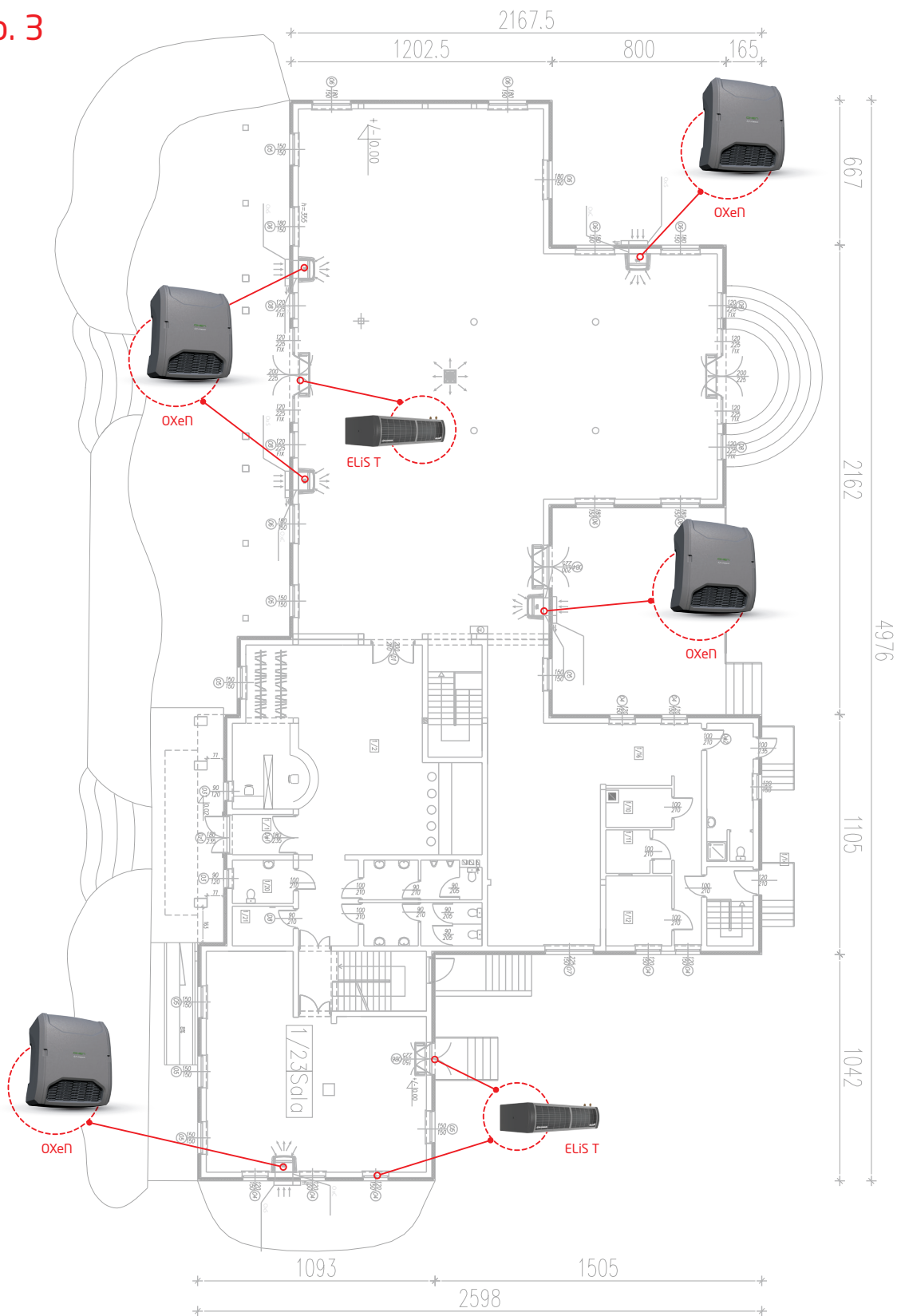
In addition, the selected units are in version with modulating motors. The EC fans (electronically commutated) used in these units enable energy savings of 40% per annum.

Advantages of LEO FB unit are:

- durable and resistant to dust casing made of EPP (expanded polypropylene),
- easy installation thanks to rotation console,
- low weight of the unit – 13 kg.

To protect the object against heat losses associated with frequent gate opening the ELiS G air curtains in vertical version were applied. Thanks to range up to 7,5 m they are able to secure door opening.

Case no. 3



Used units:

Ventilation



OXeN
(heat recovery units)

Air curtains



ELiS T
(air curtains)



Customer needs:

Provide ventilation in two banquet rooms. Customer wanted energy-efficient solution and easy to use control system, which can be used by staff working in the object.

General project assumptions:

- heating medium parameters: 70/50°C,
- inside temperature: 18–20°C,
- assumed external temperature: –20°C.

Project assumptions – room no. 1:

- about 200 people,
- $V = 200 \times 20 = 4000 \text{ m}^3/\text{h}$, assumed:
 $V_{\text{sup}} = 4800 \text{ m}^3/\text{h}$,
- approximate heating capacity demand: 65 kW ventilation - 48 kW recovered heat (OXeN) = 17 kW

Project assumptions – room no. 2:

- about 50 people,
- $V = 50 \times 20 = 1000 \text{ m}^3/\text{h}$, assumed:
 $V_{\text{sup}} = 1200 \text{ m}^3/\text{h}$,
- approximate heating capacity demand: 16 kW ventilation - 12 kW recovered heat (OXeN) = 4 kW

Equipment selection proposal:

Room no. 1

- > 4 pcs. of OXeN X2–W–1.2–V ventilation units with heat recovery

OXeN heat recovery capacity:
 $Q = 4 \times 12,0 = 48,0 \text{ kW}$ recovered energy from exhausted air – savings made by 4 pcs. OXeN heat recovery units.

OXeN heating capacity:
 $Q_{\text{c max}} = 4 \times 7,6 = 30,4 \text{ kW}$; heating capacity of OXeN water heat exchangers.

$V_{\text{sup max.}} = 4 \times 1200 \text{ m}^3/\text{h} = 4800 \text{ m}^3/\text{h}$, ventilation volume (air supplying and exhausting ensured by OXeN heat recovery units), air volume can be adjusted in the range from 0 to 100%.

Room no. 2

- > 1 pcs. of OXeN X2–W–1.2–V ventilation unit with heat recovery.

OXeN heat recovery capacity:
 $Q_{\text{odz}} = 1 \times 12,0 = 12,0 \text{ kW}$ recovered energy from exhausted air – savings made by 1 pc. OXeN heat recovery unit.

OXeN heating capacity:
 $Q = 1 \times 7,6 = 7,6 \text{ kW}$; heating capacity of OXeN water heat exchanger.

$V_{\text{sup/ex max.}} = 1 \times 1200 \text{ m}^3/\text{h} = 1200 \text{ m}^3/\text{h}$, ventilation volume (air supplying and exhausting ensured by OXeN heat recovery units), air volume can be adjusted in the range from 0 to 100%.

Additional equipment – air curtains:

Room no. 1

– 3 door openings 200/225 cm, curtain above each door.

- > 3 pcs. of ELiS T2–W–200/L air curtains with water heat exchangers.

Room no. 2

– 1 door opening 150/225 cm,

- > 1 pcs. of ELiS T2–W–150/L air curtain with water heat exchanger.

Description of the installation and reasons of choosing:

To provide ventilation on two banquet rooms the OXeN units with water heat exchangers were proposed. In addition to the air exchange, OXeN units ensure heating of the air in the building due to water heat exchanger.

Advantages of OXeN unit:

lower operating costs thanks to heat recovery (approx. **1680 €** per year assuming 8 hours of operation per day, which provides savings of about 155,9 GJ of heating energy per year).

- no need of using an exhaust fans (OXeN unit ensures supplying and exhausting ventilation), no need of ducts installation,
- unit is equipped with complete control system. Easy to use T–box touch panel enables to connect to the building management system,
- meet heat recovery law regulations.

To protect door openings against heat losses in winter and chill losses in summer, the universal ELiS T air curtains in standard version were applied.

