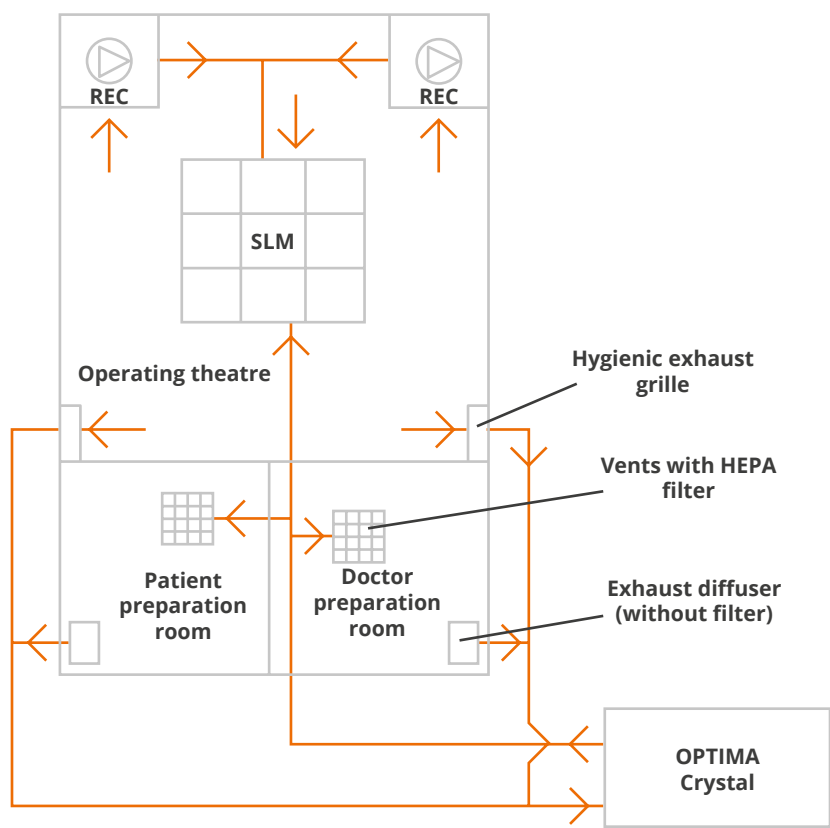




Offer for **hospitals and rooms** with high hygiene requirements.

# Layout of operating theatre



## Optima Crystal

**OPTIMA CRYSTAL unit (hygienic) is designed and intended for buildings with the requirements for „clean rooms“, i.e. hospitals, laboratories, advanced technology production plants, buildings of the pharmaceutical industry, food industry and others...**

These devices are characterized with well-designed design solutions, guaranteeing ultra-clean air in an air supply area, free from all kinds of dirt and dust, odorous substances, fungi, mould and micro-organisms.

Functions	Series of types	Recovery type
Ventilation Heating Cooling Humidifying Draining	Efficiency: 1 000 ÷ 65 000 m3/h (0,27 ÷ 18,05 m3/s)*  11 size types - with individual suitable modifications  Supply, exhaust, supply and exhaust units, channel-less units, units of Rooftop type	Cross-flow exchanger Cross-flow counter-current exchanger Rotary exchanger Exchangers with transfer medium Heat pipe Heat pump/refrigerating unit Mixing chamber A combination of these types of recovery

\* At the request of the customer, we offer units with higher efficiency.

It is possible to set dimensions, size and functions in such a way to adjust the units to the individual requirements of each building and room, which require ventilation and air conditioning system.

**The materials used in the unit are resistant to commonly used disinfectants.**

OPTIMA CRYSTAL structure and sealing are suitable for use under varying conditions (climate, adverse) and in increased pressure.

# Optima Crystal



## Laminar ceiling

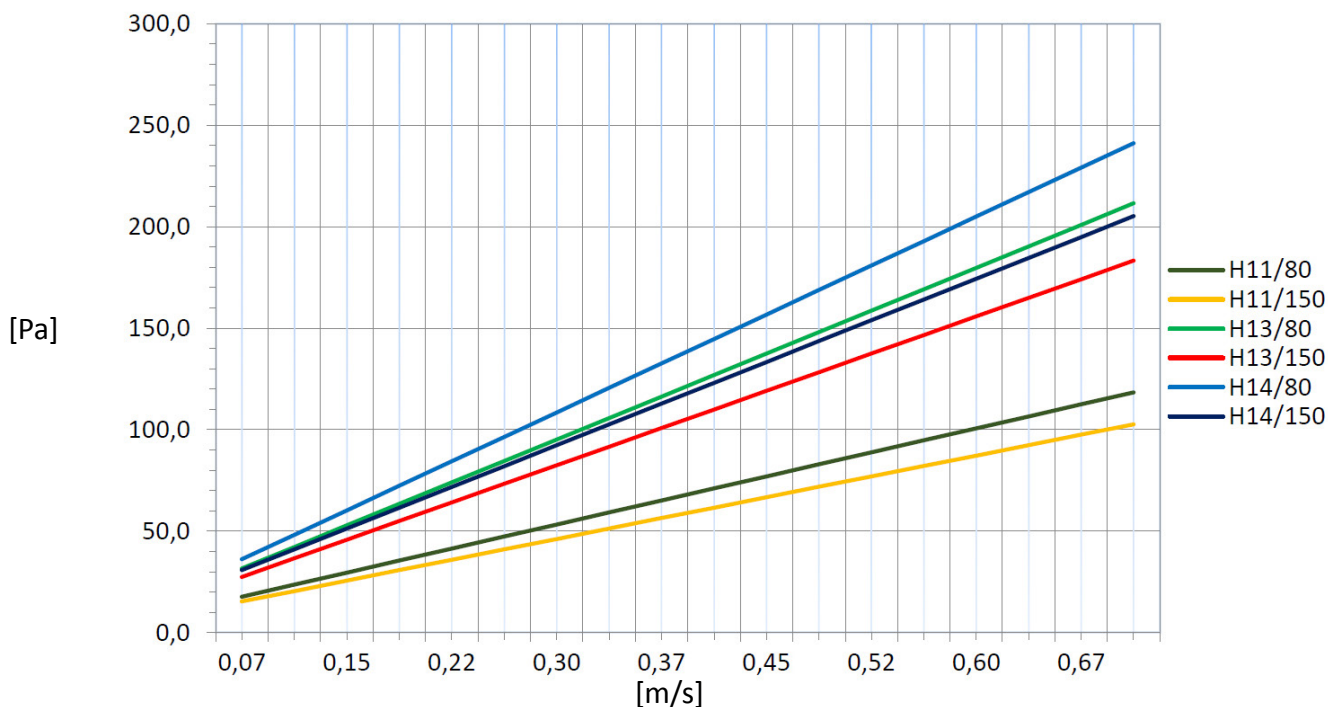
**Laminar ceiling air supply (SLM)** is a special, suspended ceiling device to ensure proper cleanliness and filtration of air supplied to an operating theatre.

The devices are equipped with absolute filters (HEPA) with a high class of filtration (ensured with the certificate of the producer).

Proper selection of a ceiling size ensures stable, laminar air supply to an operating theatre at 0.15 to 0.3 m/s.

The whole structure is made of stainless steel (304), including outlet, perforated „ceiling tiles” (screen), visible from an operating theatre.

Chart of air flow resistance through the SLM module.



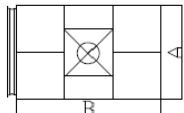
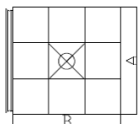
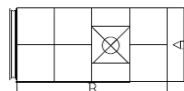
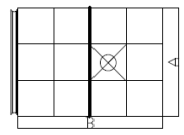
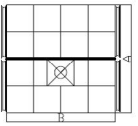
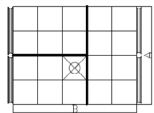
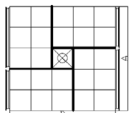
Approximate initial air flow resistance [Pa] (+/- 10%) for H11, H13, H14 filter with thickness of 80 mm and 150 mm, at a relevant air flow rate through the SLM module.


In case of increased resistance by more than 80% of the values shown in the chart, it is recommended to replace them.



# Laminar ceiling

## Technical characteristics of diffusers of SLM series

Vent size type	Functional layout and dimensions	Air efficiency [m <sup>3</sup> /h]	Total air resistance [Pa]	Weight [kg]	Number of filters [pcs.]	Laminar flow speed [m/s]
			with filter 80/150 [mm]			
SLM-2/3		1340 - 3000	120/75	140/180	4 x (610x610) 2 x (610x305)	0,15 – 0,30
SLM-3/3		2150 - 4780	100/70	141/182	8 x (610x610)	
SLM-2/4		1870 - 4180	120/75	199/255	6 x (610 x 610) 2 x (610 x 305)	
SLM-3/4		2960 - 6570	100/70	274/350	11 x (610 x 610)	
SLM-4/4		4040 - 9000	120/75	353/450	14 x (610 x 610) 2 x (610 x 305)	
SLM-4/5		5140 - 11 380	120/75	353/450	19 x (610 x 610)	
SLM-5/5		6470 - 14 380	120/75	442/563	24 x (610 x 610)	

1.  Location of a theatre operating lamp
2. Provided flow resistance for H 13 in clean state, at Varea = 0.24m/s. At max. dirty filters - increase by 100%.
3. Ability of noise attenuation by vent: 10 -15 dB (A).
4. Total weight with frame: h = 400mm with filters of thickness of 150mm, h = 300 mm with filters of thickness of 80mm

### Notes:

- \* Vents can be made in various configurations, including without fields for a shadowless lamp for verification.
- \* Filters dimensions in the table refer to 650mm „ceiling tile“.



# Recirculation Apparatus - Optima REC

**Recirculation Apparatus - OPTIMA REC is an innovative product that provides the air environment of a building with appropriate parameters, emphasising clean air supply.**

A characteristic feature of the Recirculation Apparatus is its compact structure made of components that provide higher hygienic class.

Another advantage of OPTIMA REC is the possibility of cooperation with a laminar ceiling (SLM).

It is possible to set dimensions, size and functions in such a way to adjust the units to the individual requirements of each building and room, which require ventilation and air conditioning system.

The apparatus is supported by compact automation, providing the appropriate mode of operation and control.

The apparatus is easy to clean, and free access is provided to individual functional sections.

OPTIMA REC, due to its small size, can be placed inside an operating theatre or in an adjacent room.

**Normally, the apparatus is executed:**

- profile-less
- inside and outside housing is made of 304 steel sheet
- attenuator section, housing of noise insulation panels + frames made of 304 steel sheet
- filter frames made of 304 steel sheet
- connection branching made of 304 steel sheet
- ventilation membrane made of 304 steel sheet
- 800 mm frame made of 304 steel sheet
- floor - an envelope with floor drain made of 304 steel sheet
- plastic handles/ hinges
- inlet shutter in front of a filter, painted or made of 304 steel sheet

Purpose	Functions	Series of types
Service of operating theatres and other medical facilities with the requirements of „clean rooms“	Ventilation Heating Cooling	Efficiency: 1000 m3/h and 2000 m3/h

## Vents with HEPA filter

NH suspended vents with a filter of HEPA 13 class are designed for air distribution in ventilation and air conditioning systems, for buildings with higher hygiene standards, such as hospitals, laboratories or other facilities with high demands of clean air.

**Standard execution of NH vents is provided in the following variants:**

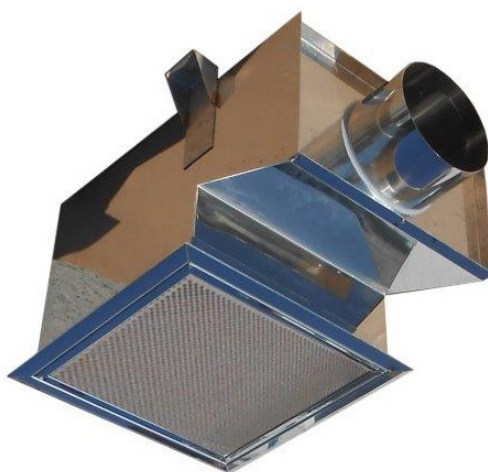
- PEP: vent with perforated steel sheet with rectangular connection;
- PEO: vent with perforated steel sheet with round connection;
- ANP: vent with swirl diffuser with rectangular connection;
- ANO: vent with swirl diffuser with round connection.

By default, PEP, PEO vents are intended to supply air horizontally or at a floor, while ANP, ANO vents supply air through a ceiling (e.g. suspended ceiling).

**As standard, all vents are executed:**

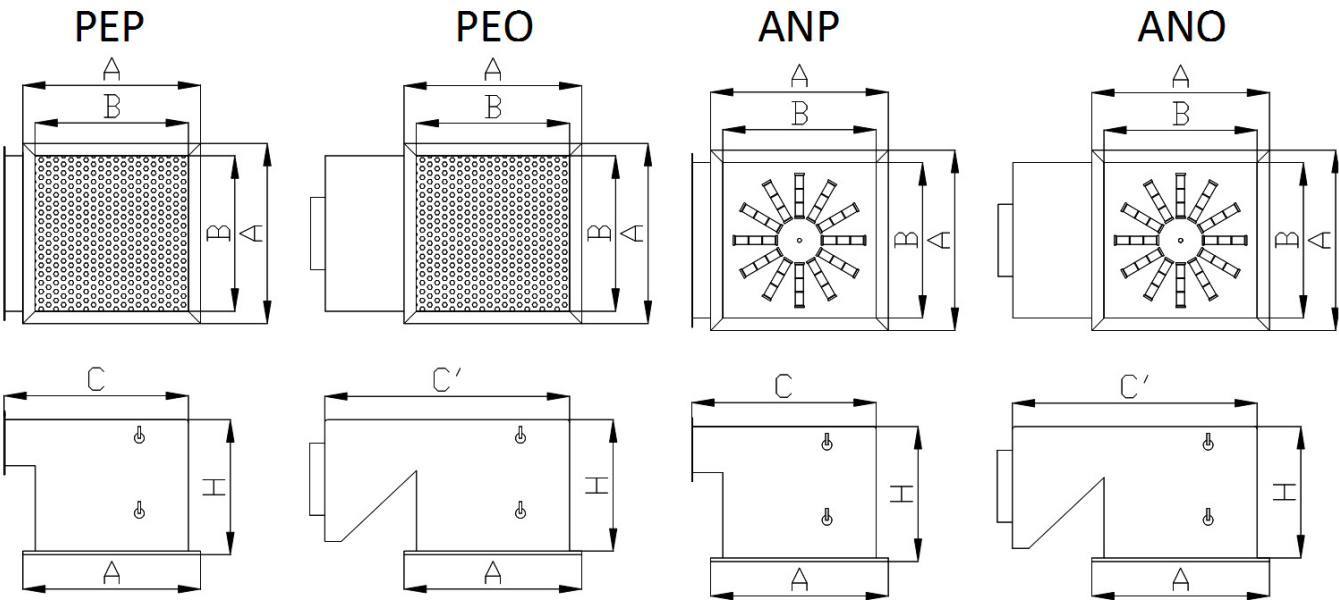
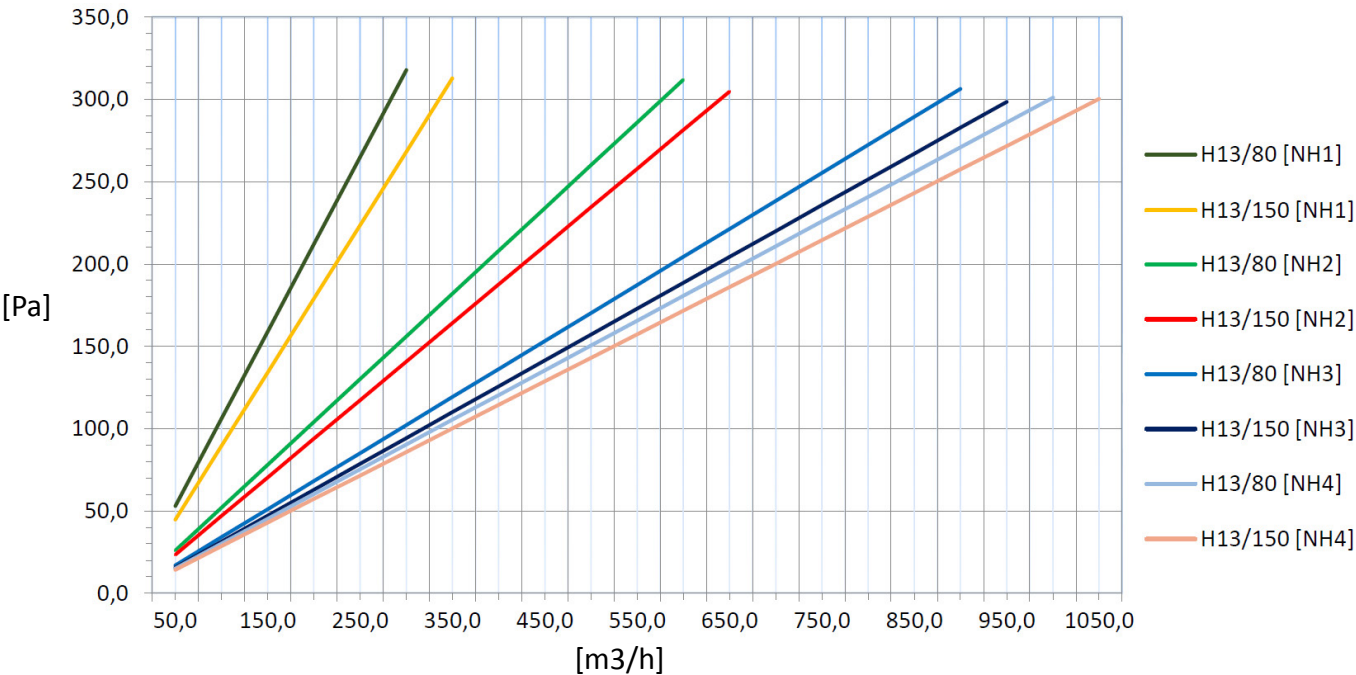
- housing made of galvanized steel sheet (non-painted);
- perforated panel made of galvanized steel sheet (non-painted);
- steel swirl diffuser with plastic blades (RAL9010 steel);
- connector pipes made of zinc, with a flexible material part.

It is also possible to execute special versions of vents using coated steel sheet (RAL to be selected), or made of 304 stainless steel sheet (only PEP and PEO versions).



# Vents with HEPA filter

Chart of pressure losses on NH ventilators with HEPA13 filter



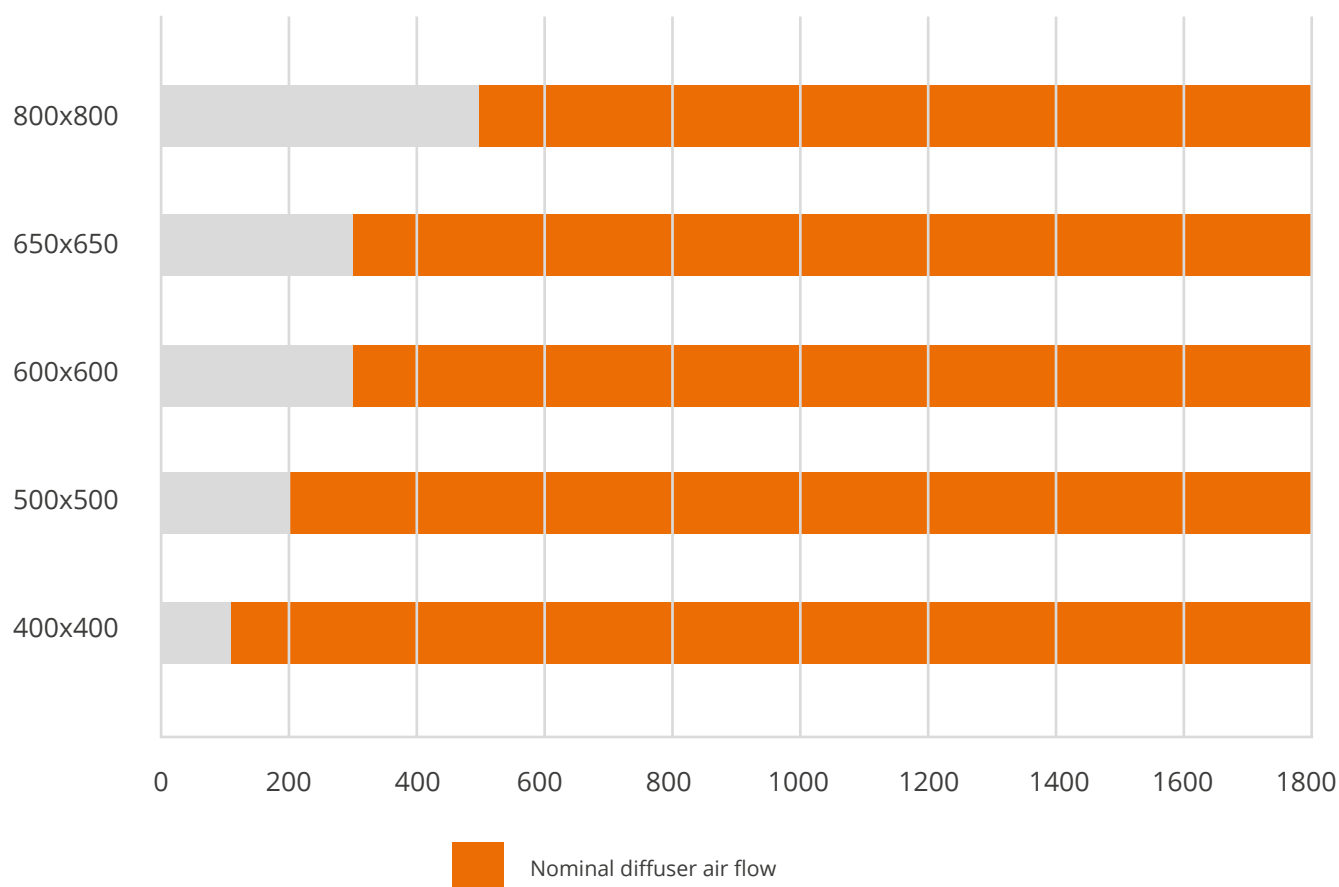
### NH vent standard sizes

Type and size of NH vent	dimensions A [mm]	dimensions B [mm]	dimensions C [mm]	dimensions C' [mm]	Replacement filter [mm]	height H [mm]	Max. air flow* [m3/h]
NH1	400	345	B+70mm	B+205mm	305x305x80	300	270
					305x305x150	370	320
NH2	500	445	B+70mm	B+205mm	405x405x80	300	530
					405x405x150	370	590
NH3	600	545	B+70mm	B+205mm	505x505x80	300	840
					505x505x150	370	910
NH4	650	575	B+70mm	B+205mm	535x535x80	300	950
					535x535x150	370	1000
NH5	800	745	B+70mm	B+205mm	705x705x80	300	1400
					705x705x150	370	1600

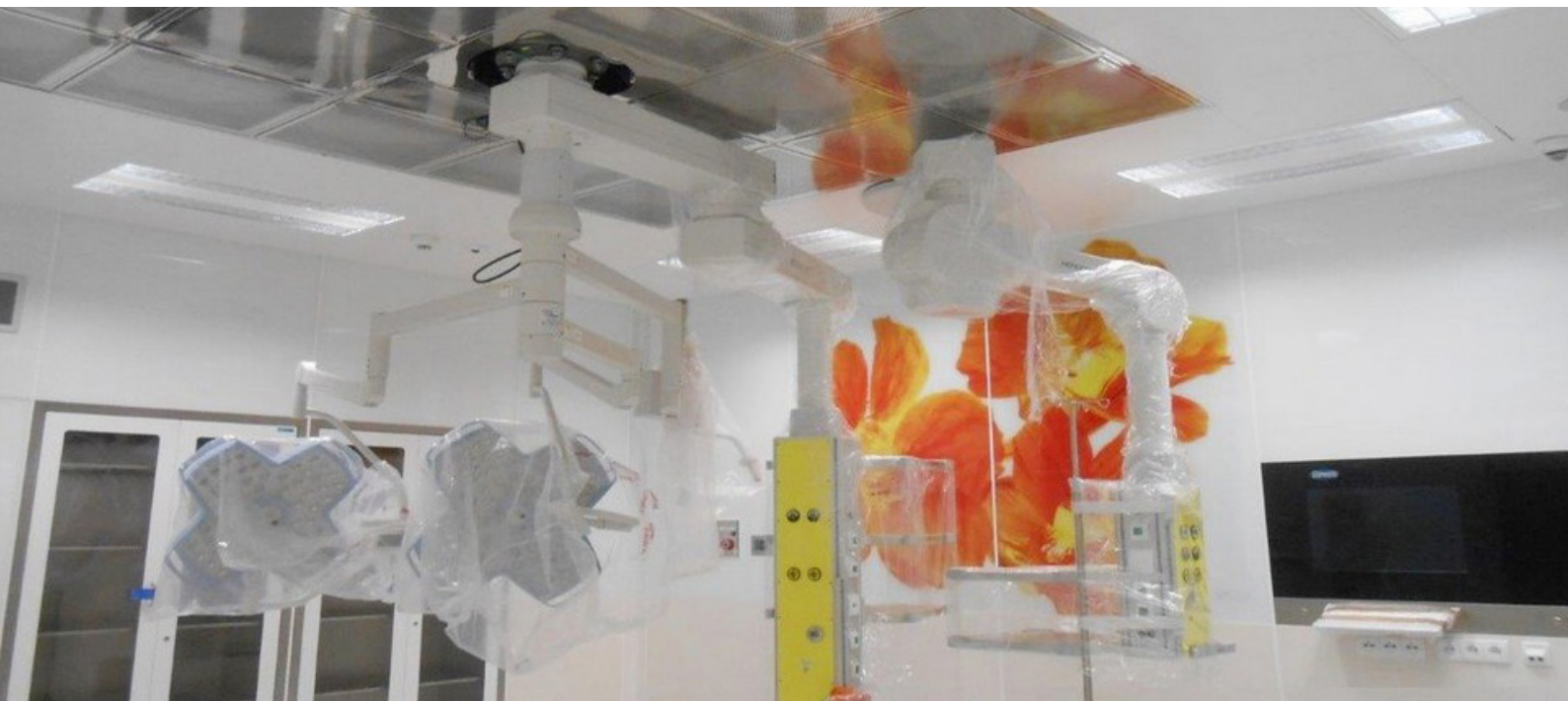
\* maximum air flow resistance: 275 Pa

When using swirl diffusers, remember to select diffusers with appropriate scope, range of air flow [m3/h]:

It is possible to execute a custom NH diffuser, based on a particular design and requirements. All guidelines of execution and notes must be given as additional information when providing a diffuser mark.







**Clima Gold Sp. z o.o.**  
ul. Dolna 23  
84-230 Rumia  
NIP: 588-22-14-851

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