



OKEANOS

A comprehensive ventilation solution in swimming pool execution.



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About us

VBW Engineering sp. z o.o.

VBW Engineering is a Polish manufacturer specializing in ventilation and air conditioning units. Our products are highly standardized and can be customized to meet specific customer requirements and design preferences. What sets us apart in the HVAC industry is our capability to fully customize air conditioning and ventilation units in technical and technological aspects.

The extensive experience and expertise of our engineers enable us to execute the most challenging projects and deliver top-quality services.

Our range comprises various air conditioning and ventilation systems, including specialized units like hygiene devices for hospitals, laboratories, and swimming pool units, designed for spaces with elevated humidity levels like pools.

Our business was established in the early 1990s, and for more than 30 years, we have executed projects in Poland and internationally. With our extensive experience, we deliver high-quality devices and solutions. We are dedicated to enhancing our portfolio with cutting-edge solutions and devices that meet market demands, all while upholding stringent quality criteria.

The company's statistics

30

A company with three decades of experience in the HVAC sector

We have been actively engaged in the HVACR sector for more than 30 years, establishing ourselves as a prominent manufacturer of air conditioning equipment.

12

12 technical and commercial offices

VBW Engineering operates 12 technical and commercial offices across Poland, enabling the provision of comprehensive after-sales support and service care.

+6200

Over 6200 devices produced annually

We manufacture more than 6200 air conditioning and ventilation units each year, customized to meet customer requirements.

+1500

More than 1500 projects are executed each year

We carry out over 1500 projects annually, providing our clients with standard ventilation units as well as units to special order.

+30

Products distributed to more than 30 countries

Our devices are present in more than 30 countries globally.

>200

Over 200 qualified employees

The VBW Engineering team is a group of experienced specialists who not only have extensive technical skills, but also a passion for creating innovative solutions.

Swimming pool unit

VBW Engineering provides swimming pool air handling units for ventilating spaces with high humidity levels. These units are suitable for use in public swimming pools, residential indoor pools, as well as in hotels and health resorts with spa areas.



Swimming pool execution

Pool units are specialized air treatment devices that exhibit high resistance to corrosion and chlorine compounds. These devices adhere to strict functional requirements outlined in relevant standards and regulations, boasting exceptional reliability to ensure prolonged usage.

What are the applications of swimming pool units?

Pool units offer a complete solution for ventilating, drying, and heating indoor swimming pool facilities for a range of purposes, from private settings to hotels and public establishments. These units not only create ideal recreational, sports, and therapeutic environments but also exhibit resistance to corrosion and chlorine compounds, owing to a specially engineered air treatment system.



RESORTS & HOTELS

Air handling units in pools are crucial for maintaining superior air quality and guest comfort by facilitating optimal air circulation and eliminating excess moisture and odors.



AQPARKS

In water parks, ventilation systems are crucial for maintaining clean air and guest comfort by removing moisture, odors, and excess chlorine, thus enabling enjoyable and safe use of water attractions throughout the year.



SPORTS SWIMMING POOLS

Air handling units in sports swimming pools are crucial for maintaining proper air quality, reducing humidity, and preventing excessive evaporation. This helps enhance user comfort and ensures ideal conditions for physical activity.



RESIDENTIAL SWIMMING POOLS

In private swimming pools, central ventilation is crucial for preserving a clean and healthy environment, removing moisture, excessive chlorine, and odors, enabling owners to relish their private pool in pleasant conditions.

Which pool equipment is the optimal choice?

Air temperature in the room

Room Type	Room temperature varies depending on the water temperature.	
	min.	max.
Entrance hall, adjacent rooms and stairways	18	22
Changing rooms	24	28
Sanitary facilities, administrative offices, and staff quarters.	22	26
Showers with adjacent toilets	27	31
Swimming pool hall	30	34

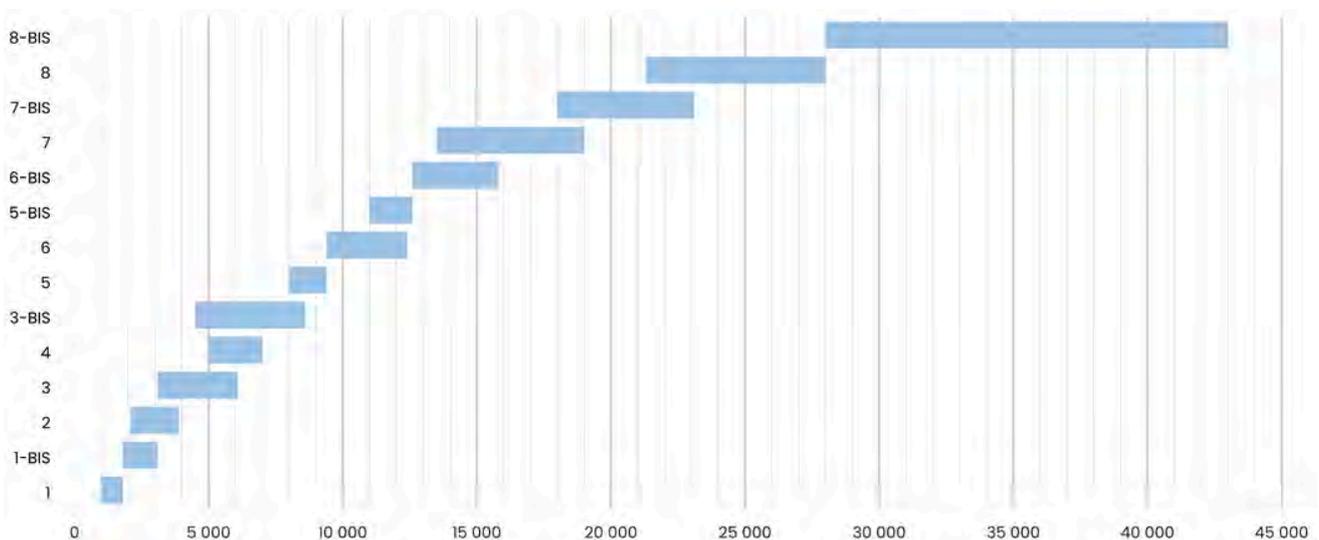
Indoor swimming pools, due to significant moisture gains, must feature an efficient ventilation system to assimilate excess humidity. However, it is essential to remember that if the ventilation also serves the purpose of heating the pool hall, a balance of heat gains and losses must be prepared. This is to determine whether the amount of ventilation air calculated based on moisture gain criteria is sufficient. To maintain low humidity levels in the room, moist air must be removed, and dry air must be supplied from outside.

Temperature range of swimming pool water

Pool type	Water temperature (°C)
General swimming pool	24 - 28
Swimming lessons pool	26 - 30
Kiddie pool	28 - 32
Spa swimming pool	23 - 32
Aquatic therapy pool	30 - 34

Relative humidity in the swimming pool hall should be in the range of 45 to 65%.

Performance range



What makes our swimming pool units worth choosing?



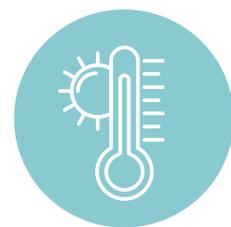
Optimal solutions

We can provide proven technologies and solutions for fresh air dehumidification with heat recovery.



Heat pump technology

The OKEANOS unit offers the possibility of incorporating a heat pump, enhancing the heat recovery coefficient and guaranteeing substantial cost savings.



Ideal swimming pool conditions

The OKEANOS swimming pool unit ensures thermal comfort and optimal humidity levels, creating an ideal swimming environment.



Cost reduction

The device's high energy and thermal efficiency enable a reduction in operating costs.



Technical support

We assist clients in device selection and provide service facilities.



Environmental Protection

Our research and development team is dedicated to minimizing our carbon footprint by enhancing the eco-friendliness of our products.

OKEANOS

A swimming pool unit with increased resistance to corrosion and chlorine compounds.

Sizes



14

Air flow range



1000 – 43 000 m³/h

Product information



Case

- The control unit is constructed utilizing aluminum profile frame technology
- The covers comprise an outer sheet (Magnelis ZM310) and an inner sheet (Magnelis ZM310)
- Internal implementation
- Insulation of the device is 50 mm thick



Heater

- Water heater
- The heater casing consists of galvanized steel, while the collectors are constructed from copper or steel
- The heater collectors feature extra connections for venting and draining the heating medium from the heater
- Heaters are chosen by the manufacturer according to the parameters supplied by the customer



Heat recuperation

- Heat recovery - crossflow exchanger/counterflow exchanger



Filters

- ISO ePM10 65% Efficiency (M5)
- ISO ePM1 50% (F7)



Fans

- Highly effective EC motors
- Fan frames consist of Magnelis sheet or galvanized coated sheet
- Operation of the engine within the optimal speed range
- Decreased heat production



Automation

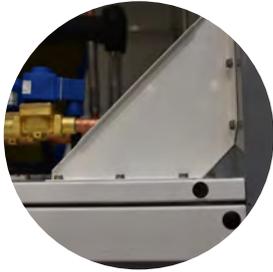
- Power and control switchgear integrated within the device
- Device cooperation with peripheral components
- Plug&Play automation (option)



Special version

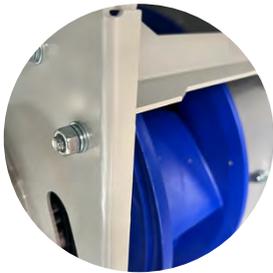
- Additional water condenser for heating swimming pool water
- Additional water condenser for heating household water
- Reversible heat pump for cooling fresh supplied air in summer
- Electronic expansion valve in the heat pump refrigeration system or reversible system
- Inspection windows or peepholes and internal lighting within the control unit
- Any color of the panel covers and frames
- Version that allows the installation of the control panel outside the facility
- Automation system integrated with the BMS master system

Benefits of the OKEANOS swimming pool system



1 Rugged casing

The control unit exhibits high resistance to corrosion and is prepared to operate in a C4/C5 environment.



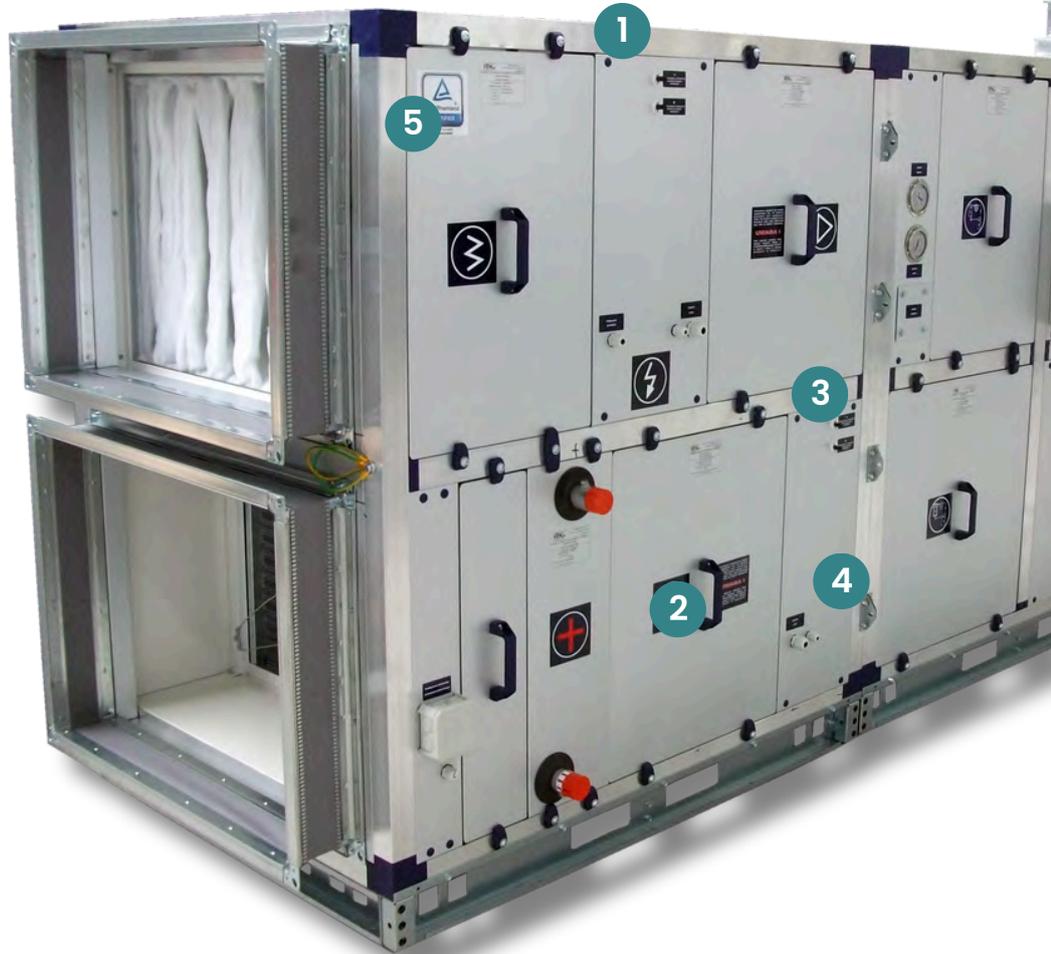
2 Engine protection

High-efficiency AC or EC fans ensure optimal performance throughout the entire operating range. Motors are splash-proof, painted IP54, and powder-coated.



3 Automation

User-friendly control system for premium demand management. Automated monitoring and regulation of temperature and humidity in the indoor swimming pool area.



4 Heat pump

Potential installation of a heat pump to enhance the heat recovery coefficient, leading to cost savings. This involves capturing heat from exhaust air and utilizing it to heat the swimming pool water.



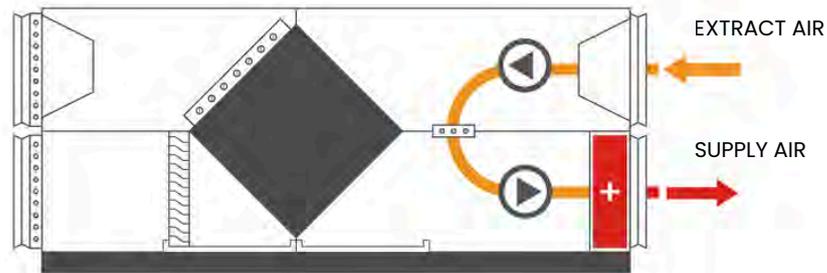
5 Certificates

OKEANOS swimming pool units have received TÜV certification, affirming the high quality and reliability of the device.



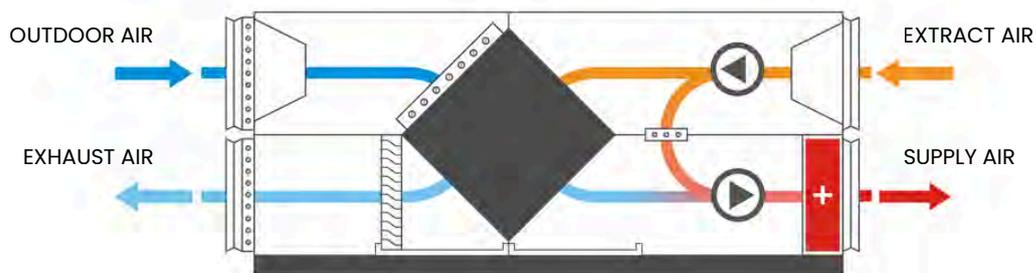
Operation Principle of Swimming Pool Units

Swimming pool air handling units with double-stage heat recovery



a) Heating of recirculated air in swimming pool non-operation period.

Full recirculation during periods when the pool is not in use and acceptable indoor air humidity is not exceeded fans operate at reduced capacity and if needed, water heater warming the air to a minimum temperature in the hall are operating.

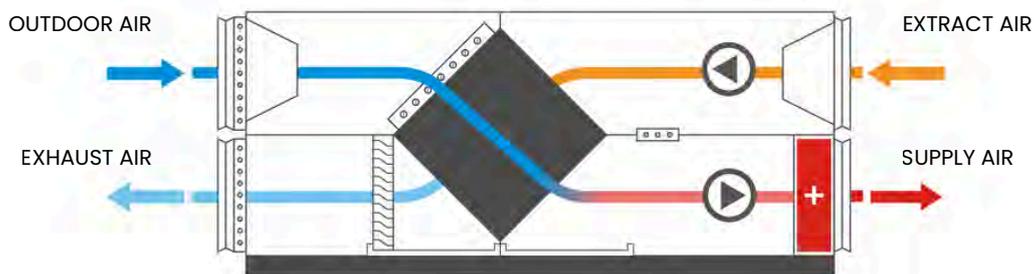


b) Air dehumidification mode in winter while using the pool.

The air extraction system in the swimming pool hall operates by extracting air through the exhaust fan. Within the mixing chamber, a portion of the air combines with fresh air, while the remainder, having passed through the cross-flow exchanger to transfer heat to the fresh air, is expelled outside. The ratio of fresh air to extracted air varies based on the humidity levels within the hall. During winter, when the specific humidity of fresh air is significantly lower than that of the hall air, the need for fresh air due to dehumidification is minimal. Consequently, the minimum fresh air requirement in winter is determined by the criterion of fresh air per person. Following the exchange process, the fresh air is warmed, then mixed with exhaust air, heated to the desired temperature in a heater, and finally circulated back into the swimming pool hall.

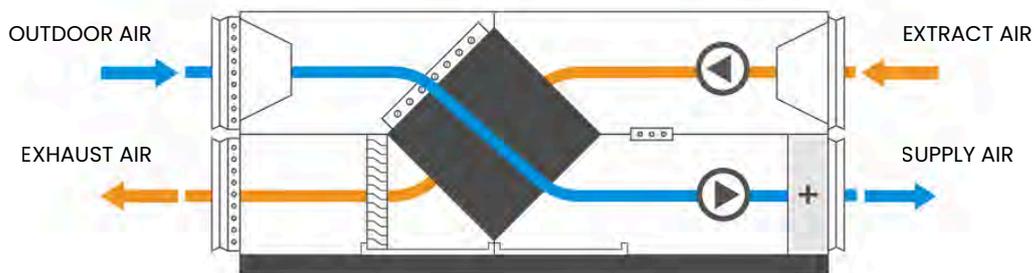
Operation Principle of Swimming Pool Units

Swimming pool air handling units with double-stage heat recovery



c) Air dehumidification mode in transition period.

During times when the outdoor air temperature is slightly lower than the air temperature inside the hall and there are substantial heat gains in the swimming pool, fresh air is split into two streams. One stream passes through the exchanger to reclaim heat, while the parameters of the second stream remain unchanged as it bypasses the exchanger. The air is then combined after the exchanger and directed into the hall without additional treatment. This method allows for the regulation of the supply temperature by adjusting the level of heat recovery in the recuperator.

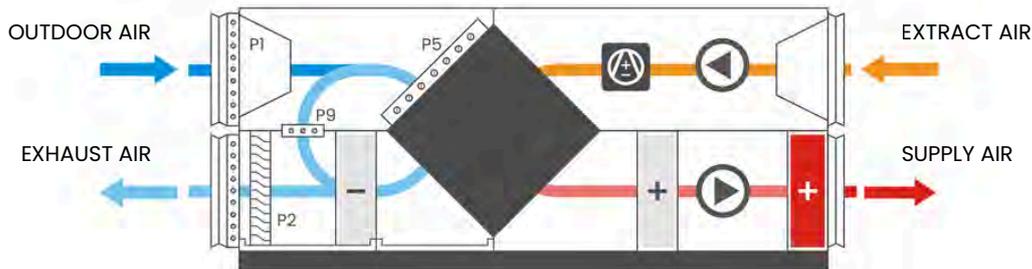


d) Air dehumidification mode in summer period

During the summer, when the temperature inside the swimming pool enclosure rises, fresh air circulates through the bypass of the cross-flow heat exchanger, preventing heat recovery. The air within the system remains unchanged, solely serving to dehumidify and ventilate the swimming pool area.

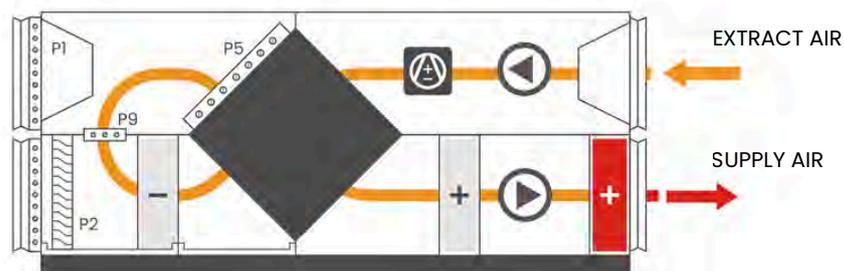
Operation Principle of Swimming Pool Units

Operating modes of the unit with three-stage heat recovery in the version featuring a cross-flow exchanger and a heat pump.



a) Day mode is the high-activity setting of the AHU.

- The automation system aims to guarantee thermal comfort by adjusting the heat recovery level on the cross-flow exchanger, activating the heat pump compressor, and regulating the heater valve to control cascade temperature.
- Optimal humidity in the swimming pool hall is maintained by adjusting recirculation levels based on the relative humidity of the air.
- The device functions with the minimal fresh air required for hygienic purposes. The central office operates at full capacity.



b) Night mode entails a decrease in AHU operation.

- Operate within a circulating air system to regulate the predetermined temperature and humidity levels.
- The automated system controls the designated air temperature within the swimming pool enclosure. The fans function with decreased efficiency, while temperature adjustments are made by modifying the heater valve's opening degree.
- To maintain optimal humidity levels, the automation system will activate the nominal fan output and the heat pump when surpassing the initial humidity threshold. If the second threshold is surpassed, the system will adjust the fresh air supply to the nominal fan output.



Realizations

Ensure air comfort with VBW Engineering HVAC systems

VBW Engineering is responsible for ensuring air comfort in facilities across Poland and various locations worldwide. Our extensive portfolio includes thousands of projects created for investors from leading global companies and brands.



Projects – OKEANOS



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3



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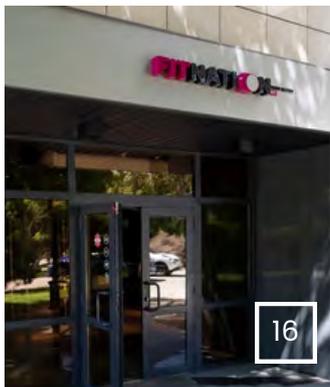
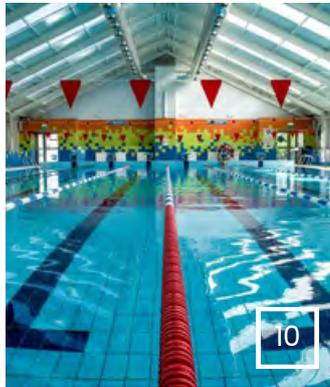


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[1] Axis Tower (Gruzja), [2] Carolus Thermen Bad Aachen (Niemcy), [3] Esentai City Apartments (Kazachstan), [4] Aquarion Water Park (Żory), [5] Pływalnia AQUA (Bielsko-Biała), [6] Almaty Arena (Kazachstan), [7] Gino Paradise Aquapark (Gruzja), [8] Olymp IV (Kołobrzeg) [9] Soyol SPA Centre (Mongolia), [10] Kryta Pływalnia MANTA-MOSiR (Wodzisław Śląski), [11] Hotel Padis (Rumunia), [12] Leoland (Ukraina), [13] Spa&Wellness - Pałac Runowo (Bydgoszcz), [14] Kryta pływalnia Delfin - OSiR (Wrocławek) [15] Kryta Pływalnia MANTA-MOSiR (Wodzisław Śląski), [16] Fitnation (Kazachstan), [17] Pensjonat Sośnica (Zakopane)



Contact us!

Our goal and commitment is to provide you with the highest quality air conditioning and ventilation products combined with a package of professional consulting services. Our technical and commercial representatives are at your disposal!

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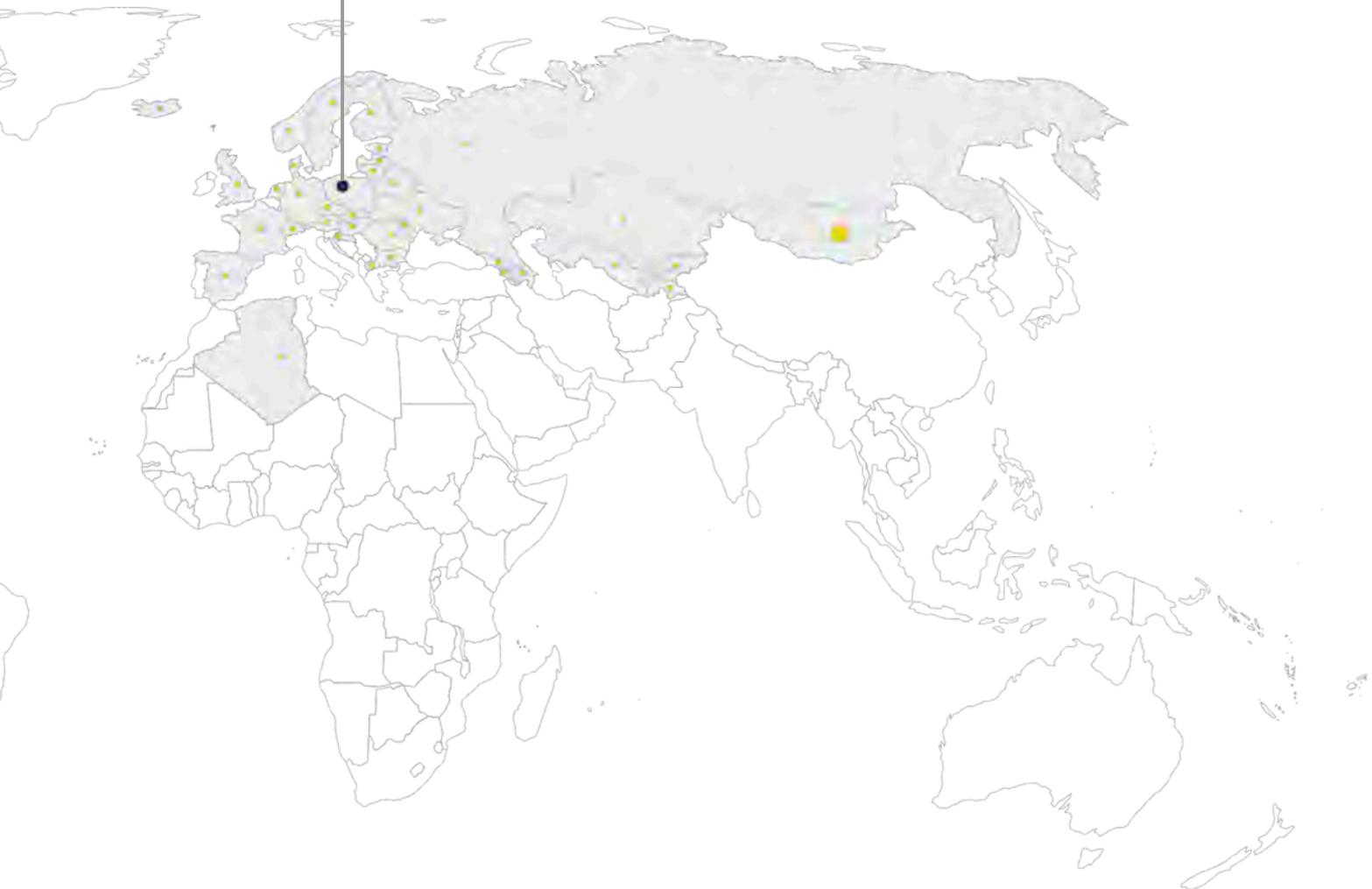
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