INDU

Powerful and flexible air cleaning with UV-light and ozone for large air flows

UVTECH INSIDE
WE KNOW AIRCLEANING

Flexible air cleaning for large air flows

UVtech INDU is an air cleaner that was developed specifically for places with a large exhaust air flow or for places where, due to space and location, the air cleaning system must be installed at a distance from the source of origin of the polluted air. INDU is a highly flexible system whose air cleaning efficiency can be adjusted according to the level of pollution at any specific location. INDU can be used in industrial ventilation, restaurant ventilation and all other ventilation systems.

Reduction of organic odours

INDU is most commonly used to reduce the odour load of exhaust air. Organic odours are highly complex in respect to their chemical composition. There are thousands of substan-ces with different chemical bases and odour characteristics present at different concentra-tion levels and in different mixtures.
UVtech INDU provides the best prerequisite for achieving an efficient reduction of organic odours. By using a combination of UV-light, ozone and specific radicals for exhaust air tre-atment, INDU can resolve most odour hazard issues.

Environmental protection regulations demand that odorous emissions from businesses must not be a nuisance to any neighbours. Instal-ling INDU solves persisting odour problems and presents a viable alternative to moving or shutting down a business in consequence to recurring odour nuisance complaints.

Olfactometer tested equipment

Odour load readuction can only be measured by a standardized test: the olfactometer test. UVtech is the only producer of UV air cleaners that has carried out an olfactometer test conducted by an independent testing institute. The test shows an odour load reduction of between 74 and 96% for INDU.

What is an olfactometer test?

Olfactometer tests are based on European normalization standard DIN EN 13725 and measure odour concentration in air samples. A panel of qualified people is presented with an air sample and test to determine the odour levels and the extent of dilution needed to eliminate the odour load. The dilution factor is conventionally called odour concentration and measured as GEE/m³.

Prevents grease condensation build-up in the ventilation duct system

UVtech INDU is also used in restaurant kitchens to prevent grease condensation build-up in the ventilation duct system. INDU should be used in addition to a well-functioning commercial extractor hood equipped with efficient mechanical grease filter. The UV-air cleaner breaks down the remaining grease particles in the exhaust air into polymerized carbon compounds. As a result, the ventilation ducts remain clean and free of grease.

Integrated safety system

INDU is equipped with an integrated safety system that automatically switches off the UV-tubes if the exhaust fan stops running or if the UV-tubes are disposed. INDU uses both UV-light and ozone in the air cleaning process. There are regulations as to how much UV-radiation and ozone humans can be exposed to, and therefore you need this kind of efficient and mandatory safety system to make sure that neither UV-light nor ozone escape the ventilationssystem.

Reduces fire hazard risk and cleaning costs

Preventing grease build-ups in the ventilation ducts of buildings with several restaurants or particularly large restaurants is of vital importance since the grease deposits in the ducts increase the risk of combustion and spreading of fire. When INDU is combined with extractor hoods equipped with efficient certified mechanical grease filters, it destroys the remaining grease particles efficiently and turns them into harmless polymeres. The ventilations ducts remain clean, which implies decreased fire hazard risks and decreased duct cleaning costs.

Facilitates heat recycling in restaurant kitchens

Since INDU efficiently removes grease from the kitchen exhaust air, the air can be passed through a heat recovery unit, and the heat can be recycled. This can save hundreds of thousands of kWh per year.

Please, note that you must not use a rotating heat recovery unit in cases where the exhaust air from a restaurant kitchen is recycled and used for ventilating other spaces than the restaurant kitchen, e.g. shops, offices or appartments. There is no guarantee that the spreading of odours can be prevented to 100 % in rotating heat recovery units.

Simple installation

INDU is a module system in three standard sizes. The module replaces a piece of the exhaust air duct and is installed by means of spigots connecting the module to the duct.

References

Atle Verken

Atle Verken is one of Sweden's largest composting plant. When Atle Verken was built, it was located outside of Örebro, but the growing town crept nearer and nearer. In the end, the neighbours could smell the composting odours on a regular basis. INDU was installed and has been funtioning perfectly for years now.

MCC -

Mega Cooking Center Vienna

On average, MCC produces more than 100.000 meals a day for different institutions in and around Vienna. It is located in a part of the city that has been restructured from industrial to residential. More and more of the new neighbours complained about the cooking odours and demanded that MCC must move to a new location. Moving was deemed too expensive and, instead, different technical solutions for reducing grease and odours in the exhaust air were considered. The final decision fell on INDU, and since it was installed, TÜV Austria checks regularly that the emissions stay within the limits. MCC continues with its flourishing business.

Technical specification

Product description

INDU is a module system provided in three standard sizes to be easily adjustable to different needs. Depending on the actual air flow the modules are equipped with varying numbers of UV-tube cassettes. The standard module frame is made of stainless steel but the frame can be made in acid-proof steel if needed. INDU is equipped with an integrated safety system that switches of the UV-tubes whenever the exhaust fan is switched off ot the UV-tubes are exposed.

The control system is mounted on the service hatch and it shows three types of error messages, a warning when it is time for maintenance (interval adjustable) and a warning when it is time to exchange the UV-tubes. The control system can be connected to a superordinate monitoring system via NC/NO contacts.

Mounting

INDU kan be placed on the floor or mounted on a wall or ceiling. The module replaces part of the exhaust air duct and is installed by means of spigots on either end of the module. The spigots must be designed and ordered separately since they are not part of the INDU delivery. The mains supply connects to 1-phase 230 V via an external safety switch (see electrical data below).

Operation and maintenance

The UV-tubes need to be cleaned on a regular basis, and UVtech recommends a cleaning interval of two weeks. The tubes need to be wiped carefully with a moist cloth – generally, there is no need for the use of detergent. The UV-tubes have a service life of 12.000 hours or 2 years, depending on which is reached first, and need to be exchanged thereafter. The control system indicates warnings both for the need for maintenance (interval adjustable) and the need for UV-tube exchange.

Technical data

See table on the last page.

Dimensions and design

INDU is designed in 5 steps.

1 Plan the placement of INDU

INDU replaces part of the exhaust air duct and needs to be placed as close to the source of grease and odour emission as possible as well as in a position that allows the air a remaining minimum of 2 seconds within the duct before it reaches the air handling unit or before it is emitted. These 2 seconds are necessary for an efficient odour reduction; a shorter reaction time might give worse odour reduction results.

2 Determine which type of INDU module is needed

The modules are named according to their construction, i.e. number of levels and cassette slots, and their capacity in x100 l/s; e.g. an INDU2432 has two levels (2) with four cassette slots each (4) and a capacity of 3200 l/s (32). The total capacity of the INDU module must be the same or larger than the amount of air that needs to be treated.

3 Check the physical space at the planned location for INDU

Check that the physical space where INDU will be installed is sufficiently large to fit the module and to allow extra space - called “restricted area” in the table below - to fully open the service hatch and insert and remove UV-cassettes. In addition, the service staff needs space to gain easy access

4 Plan and design the spigots

INDU replaces part of the exhaust duct and needs to be connected to the duct by means of spigots on both sides of the module. These spigots need to be designed and ordered separately since they are not part of the INDU module.

5 Check the conditions at the exhaust point

5.1 When INDU is installed to specifically reduce the odour concentration in the exhaust air, it must be complemented by a cartridge carbon filter.

5.2 When INDU is installed for other purposes, e.g. to remove grease, it must be complemented by a cartridge carbon filter when the exhaust air is emitted in a place where people stay for longer periods of time, like inner courtyards, loading docks, garages, etc. This is necessary because the remaining ozone in the exhaust air can be a nuisance odour in itself. The carbon filter must be installed behind the length of the duct needed for the minimum reaction time of 2 seconds.

5.3 In both types of cases (5.1 och 5.2) the size of the carbon filter needs to be designed to ensure that the pressure drop does not exceed 25Pa. A higher drop in pressure can cause the air to pass through the filter too quickly which means that the filter efficiency will be diminished.

Example - Dimensions and design

A composting plant needs to reduce the odour concentration of its exhaust air because the people in the neighbouring residential area have complained about the odour nuisance.The exhaust air from the composting area is led through a 17 meter long exhaust duct to the roof where it is emitted through a cartridge carbon filter. The dimensions of the duct are 1000 x 1000 mm and the total air flow is 23,500 m³/h.

1 Plan the placement of INDU

The exhaust duct is accessible in the maintenance area above the inner ceiling of the composting plant. INDU is placed directly next to the point where the duct passes through the inner ceiling in order to maximize the reaction time inside the duct. Checking the reaction time: 23,500 m³/h in 1000 x 1000 mm result in an air flow of 6,5 m/s. From INDU to the exhaust point there are 16 meters of duct (17 - 1 meter where INDU is installed). The minimum reaction time is 2 seconds which means that the duct needs to be 6,5 x 2=13 meter long. A 16 meter duct is therefore sufficiently long.

2 Determine which type of INDU module is needed

The total exhaust air flow is 23,500 m³/h. Check Table 1 on the last page for the type of module that is suitable for the same or a higher air flow capacity: Choose INDU 3468 which has a maximum capacity of 24480 m³/h.

3 Check the physical space at the planned location for INDU

The module INDU 3468 has the dimensions 1000 x 1253 x 1000 mm and the necessary restricted area adjacent to the module's maintenance hatch is 1000 x 1000 mm. The space in the maintenance area is big enough for fitting the INDU module and the restricted area.

4 Design the spigots

The spigots bridge the dimensional gap between the INDU module and the exhaust duct. The dimensions of the duct are 1000 x 1000 mm and the dimensions of the module are 1000 x 1253 mm.

5 Check the conditions at the exhaust valve

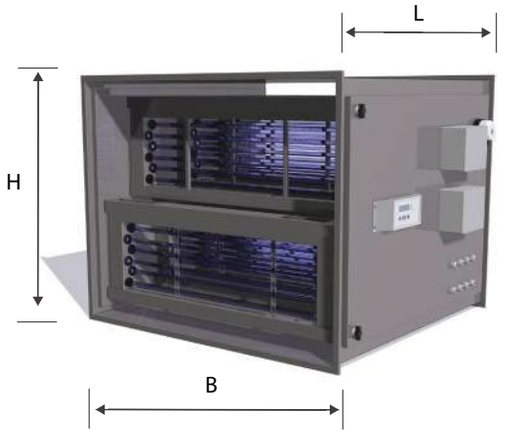
5.1 The main purpose of the project is to reduce the odour concentration of the exhaust air, and therefore, INDU needs to be complemented by a cartridge carbon filter.

5.2 Not applicable in this example

5.3 The cartridge carbon filter is designed for a drop in pressure of 21 Pa, which allows for a sufficient reaction time within the carbon filter.

Table 1 INDU

Productname	Module configuration		Maximum air flow		Dimensions (mm)			Electrical data			Number of cassettes	
	Levels	Slots/ level	(l/s)	(m³/h)	B (Width)	H (Height)	L (Length)	W	A	V	4 tube cassettes	6 tube cassettes
INDU 1304	1	3	400	1440	1000	400	800	160	10	230	1	-
INDU 1306	1	3	600	2160	1000	400	800	240	10	230	-	1
INDU 1308	1	3	800	2880	1000	400	800	320	10	230	2	-
INDU 1312	1	3	1200	4320	1000	400	800	480	10	230	-	2
INDU 2416	2	4	1600	5760	1000	800	1000	640	10	230	4	-
INDU 2424	2	4	2400	8640	1000	800	1000	960	10	230	-	4
INDU 2432	2	4	3200	11520	1000	800	1000	1280	10	230	2	4
INDU 2436	2	4	3600	12960	1000	800	1000	1440	10	230	-	6
INDU 2440	2	4	4000	14400	1000	800	1000	1600	10	230	4	4
INDU 2444	2	4	4400	15840	1000	800	1000	1760	10	230	2	6
INDU 3456	3	4	5600	20160	1000	1253	1000	2240	10	230	2	8
INDU 3468	3	4	6800	24480	1000	1253	1000	2720	13	230	2	10
INDU 3472	3	4	7200	25920	1000	1253	1000	2920	13	230	-	12



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