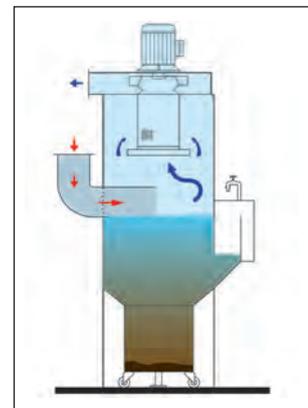




**Separation of combustible, explosive,  
humid and adhesive dusts**



Compact wet scrubber VDN-E with detachable disposal bin

# Function

**For combustible, explosive, humid and adhesive dusts**

Venturi wet scrubber collectors are used for the separation of substances that cannot normally be separated or are difficult to separate in dry

operating systems. Keller's high-performance separators inject water into the accelerated airflow utilizing the Venturi principle. These flexible

units can be utilized in almost all sectors of industry.

## Function

A capturing system collects the air pollutants at the source and conveys them via a ductwork system at the dirty air inlet of the separator to the spraying zone. At the narrowest point, water is injected into the airflow. A homogenous water curtain is created which moistens the dust particles. Heavy rotation in the separator housing separates the water drops from the airflow using centrifugal forces. The purified air is exhausted via the fan and pushed

into the exhaust air or return air system by means of a silencer. The separated dust sediments or floats on the water surface and is discharged by the disposal system.

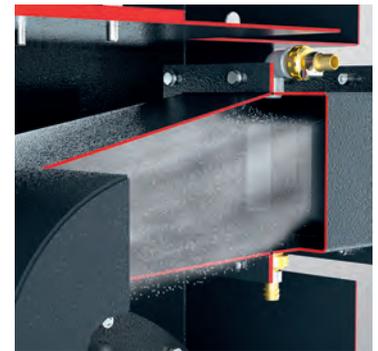


Image: In the spraying zone is created a dense water curtain

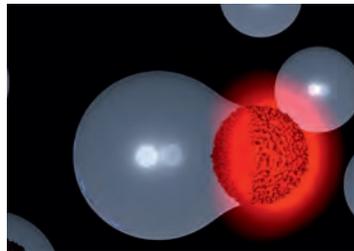


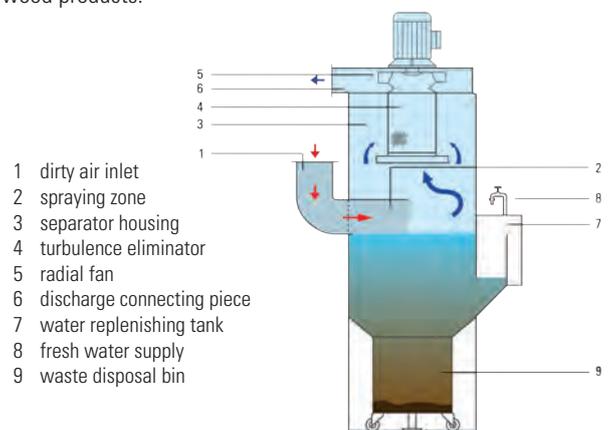
Image: The drops of the water curtain collect pollutants, glowing particles are extinguished.



Main nozzle of a VDN-TA

## Applications

- During grinding, polishing or other machining processes where glowing embers or hot dust particles may be created.
- Blasting, grinding and polishing of light metals (aluminum and magnesium alloys) whose dusts are combustible and explosive.
- Die-casting or other processes where dust and coolant fumes or mist are released.
- Moist and/or adhesive dust created in foundries and during the manufacture of ceramics or glass.
- Fumes containing dust from driers, coolants and extruders in the chemical and plastics industry.
- Press fumes released in the production of particle board and engineered wood products.



Compact wet scrubber VDN-E with detachable disposal bin

## **Open and closed systems**

The VDN series is available as a closed or open system. The "closed system" should be chosen with well sedimenting materials. The water level in the water basin is regulated in such a way that the water surface is located directly at the perforated edge of the Venturi nozzle. The water in the separator is dragged upwards and atomized. The advantages of this solution are its cost effectiveness since a water pump can be omitted. With the "open system," the water supply tank is separate from the nozzle area thereby creating an "open system." Floating particles, for

example sludge or oil, can be manually skimmed off, flushed away through the diverter, or discharged with a scraper. With an open system, the Venturi nozzle is fed with circulating water by a pump. The recirculation is accomplished by drainage ductwork for contaminated water, with the installation height determined by the low pressure in the system. Besides the Venturi nozzle, additional pre-nozzles adjacent to the collection point can also be installed, so that the ductwork can be flushed and any deposits are minimized. Water spraying occurs

both for the open and the closed system inside the nozzle by diffused air. Reductions in the upstream water pressure are not possible for either model to prevent clogging in the narrowest point (e. g. inside a hollow shaft nozzle or full shaft nozzle).

## **Pre-nozzle: Ductwork rinsing to prevent clogging and fires**

Certain processes such as hardening or plastics extrusion can create adhesive or combustible fumes and dust. To prevent clogging or fires, the dirty air is rinsed with water directly in the suction ductwork behind the

collection point by a pre-nozzle. Fumes are partially condensed inside the ductwork by adiabatic cooling which increases separation efficiency.



## **Adjustment of the water level**

All systems are equipped with a water balancing basin including level sensor, fresh water supply attachment, and discharge diverter. If the water level falls below the

required level, the solenoid valve in the fresh water fixture is opened and additional water is supplied until the appropriate level is achieved.

## **Waste disposal**

The physical/chemical properties of the slurry or sludge that is to be discharged defines the type of waste disposal equipment. If the ingredients are harmless, the waste water can be released into the municipal sewer system. However, federal and local

environmental regulations and instructions regarding appropriate water disposal must be observed. Harmful or toxic substances in water require special treatment.

# Various models

## Models

The Venturi wet scrubber compact series includes five models (VDN-E, VDN-T, VDN-TE, VDN-AS, VDN-TA). They are available in different sizes with various types of waste disposal

options. Airflows range from 1,400 cfm up to 16,500 cfm.

## HydronPlus - a compact wet separator for recirculating air operation

The new HydronPlus, awarded with the 1st prize of the Environmental Technology Award of Baden-Württemberg Germany, is especially suitable for the separation and cleaning of process exhaust air generated during brushing, blasting, and grinding processes. HydronPlus combines all advantages of a wet separator with the very high separation efficiencies of a dry process which enables for clean air

recirculation. A fan including frequency converter automatically adjusts its output to the current circumstances. Both factors contribute to the special energy efficiency of the system. With a volume flow of 900 (cfm) the HydronPlus is a flexible system which can be moved easily in case a processing station moves their position.



HydronPlus connected to a Keller downdraft table and brushing machine



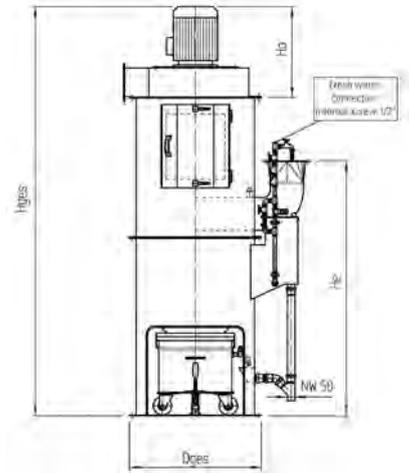
HydronPlus, Compact wet separator for recirculating air operation

## VDN-E series with detachable disposal bin

The separated dust settles as sludge in the water and is collected in the detachable disposal bin underneath the scrubber unit. The bin must be emptied periodically during system downtimes. This disposal mode is suitable for a low volume of dust consisting of particles with good sedimentation.



Compact wet separator VDN-E with detachable disposal bin



Moden series VDN-E

VDN-E				2,5	3,6	5,6	8	12,5
<b>Nominal volume flow</b>		V		2500	3600	5600	8000	12500
<b>Drive power</b>		kW		3,3	5,5	7,5	15,0	22,0
<b>Water content approx.</b>		liter		410	410	600	910	1250
<b>Diameter</b>	Total	Dges	mm	894	894	1095	1365	1495
	Total	Hges	mm	2614	2725	3042	3555	3980

Dimensions and weights are without obligation! Subject to modifications.



Overview VDN-E

# VDN-T

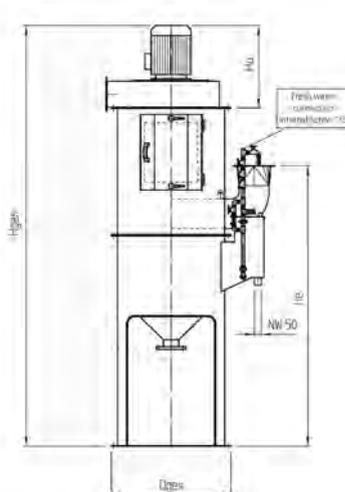
## Model series VDN-T with funnel-shaped water holding tank

The water holding tank of the VDN-T series is funnel-shaped. The separated dust collects in the hopper top which can be emptied or drained either manually by manual gate valve, or automatically by a

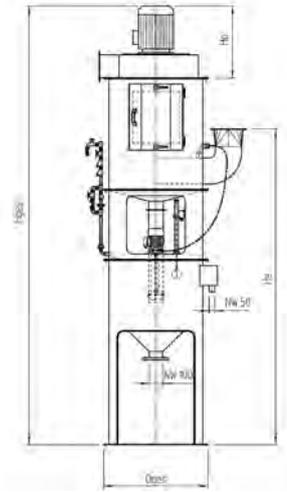
separately controlled drain valve. This system is suitable for handling low volumes of dust and water-soluble matter or coolants.



Wet scrubber VDN-T with water holding tank



Model series VDN-T (standard)



Model series VDN-T (open system)

VDN-T				3,6	5,6	8	12,5	18	22,4
<b>Nominal volume flow</b>		V		3600	5600	8000	12500	18000	22400
<b>Drive power</b>		kW		5,5	7,5	15	22	30	37
<b>Diameter</b>	Total	Dges	mm	894	1095	1365	1495	1705	1905
<b>Height standard</b>	Total	Hges	mm	3170	3530	4100	4520	4910	5340
<b>Height open system</b>	Total	Hges	mm	3770	4130	4700	5320	5710	6140

Dimensions and weights are without obligation! Subject to modifications.



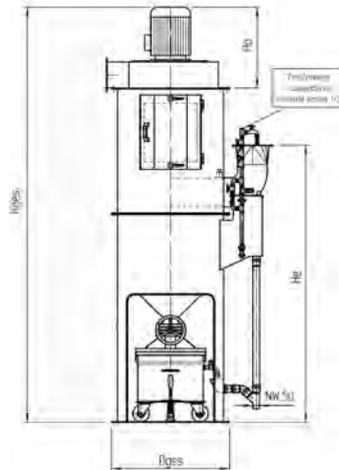
Overview VDN-T

**Model series VDN-TE as a combination of disposal types "T" or "E"**

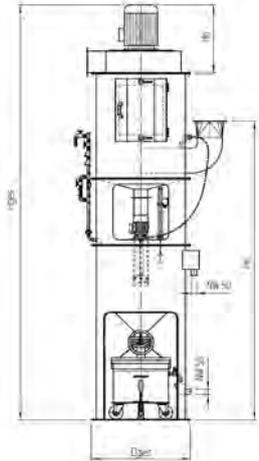
The VDN-TE is a combination of disposal types "T" or "E". The sludge removal can be controlled by a shut-off valve between the hopper and bucket without turning off the unit.



Wet scrubber VDN-TE



Model series VDN-TE (standard)



Model series VDN-TE (open system)

VDN-TE			3,6	5,6	8	12,5	18	22,4	
<b>Nominal volume flow</b>		V	3600	5600	8000	12500	18000	22400	
<b>Drive power</b>		kW	5,5	7,5	15	22	30	37	
<b>Diameter</b>	Total	Dges	mm	894	1095	1365	1495	1705	1905
<b>Height standard</b>	Total	Hges	mm	3170	3530	4100	4520	4910	5340
<b>Height open system</b>	Total	Hges	mm	3770	4130	4700	5320	5710	6140

Dimensions and weights are without obligation! Subject to modifications.



Overview VDN-TE

# VDN-AS

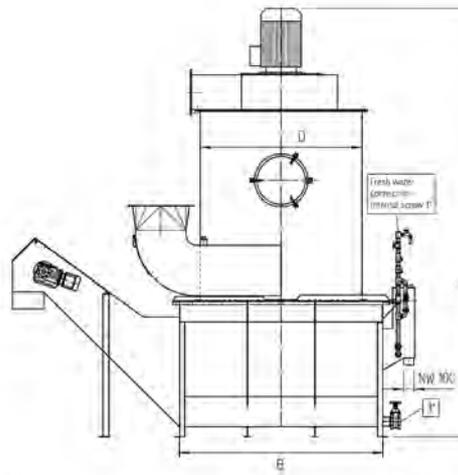
## Model series VDN-AS with automatic de-sludging device.

This unit is equipped with an automatic de-sludging device. A scraper continuously discharges the sedimented dust as sludge or at intervals. This disposal mode is

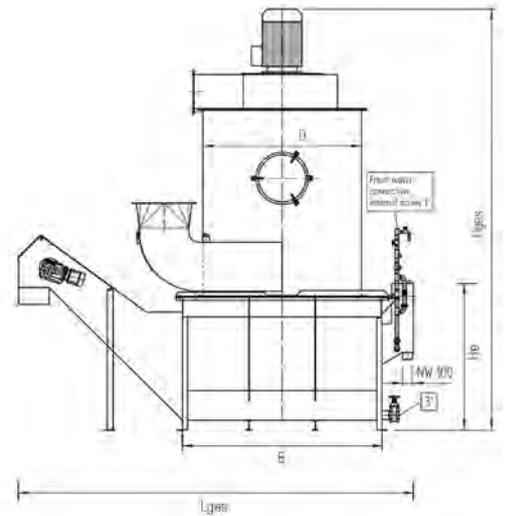
suitable for systems with a high output of dust and continuously operation (2 - 3 shifts).



Wet scrubber VDN-AS with de-sludging device



Model series VDN-AS (standard)



Model series VDN-AS (open system)

VDN-AS			3,6	5,6	8	12,5	18	22,4	28	
<b>Nominal volume flow</b>		V	3600	5600	8000	12500	18000	22400	28000	
<b>Drive power</b>		kW	5,5	7,5	15	22	30	37	45	
<b>Diameter</b>	Total	D	mm	800	1000	1250	1400	1600	1800	2000
<b>Height standard</b>	Total	Hges	mm	2630	2890	3630	3980	4270	4600	4930
<b>Height open system</b>	Total	Hges	mm	3230	3490	4230	4780	5070	5400	5730

Dimensions and weights are without obligation! Subject to modifications.



Overview VDN-AS

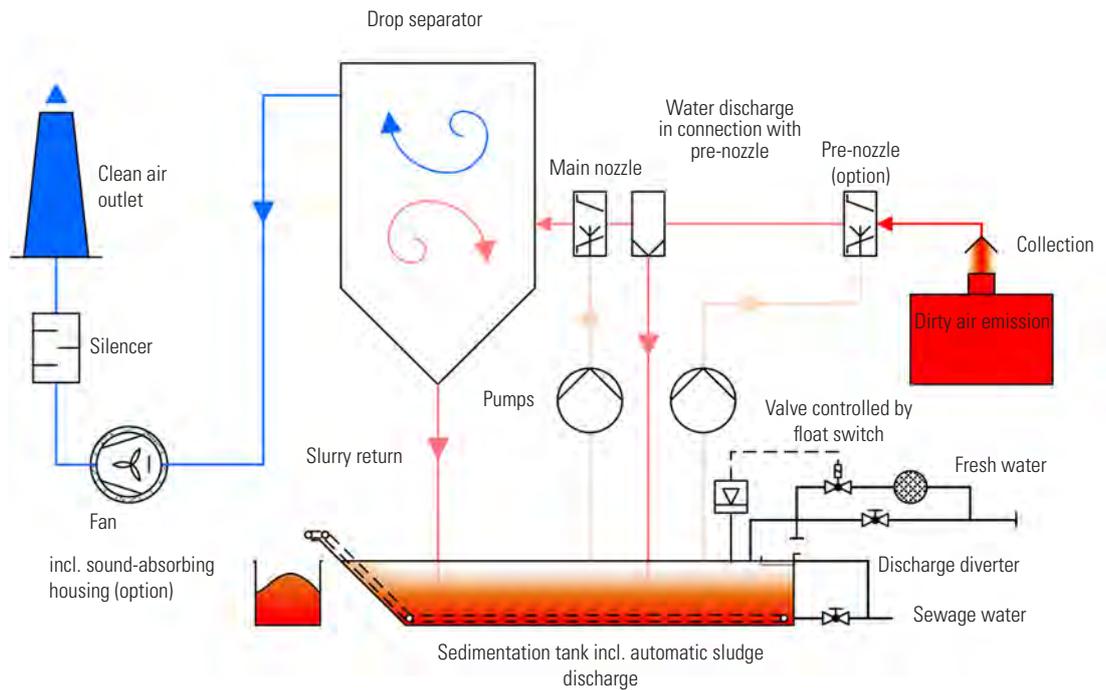
## Model series VDN-TA as flexible system for larger airflows

Systems of the VDN-TA series are designed for larger airflows. The modular construction, i. e. Venturi nozzle, mist separator and fan of this system exist in different locations, allowing the system to be adjusted to any large airflows. External installation of one or multiple Venturi nozzles requires a pump to ensure adequate supply of water to the nozzles. Moreover, the fan is installed adjacent for an easier maintenance compared to top-mounted fans.



Wet scrubber VDN-TA with sludge remover

## Feasible installation of a VDN-TA system



Components, i. e. nozzle, mist collector, sludge tub, and fan of the wet scrubber VDN-TA can be placed in different locations. This means flexibility for the design. It is also possible to operate several VDN-TA units with one common sludge

# Guidelines and Directive

<b>Chemical additives</b>	<p>Most of the known industrial dusts are extracted without any further additives by the Venturi wet scrubber. However, additives can be required in some cases. Wetting agents cause a very quick wetting of the particles which enables, encourages, or accelerates the extraction process.</p> <p>Defoaming agents avoid a heavy</p>	<p>foam creation to which some types of dust tend. Sedimentation auxiliaries to treat slurries let the particulate create flakes and enable an easier sedimentation. Hardness stabilising agents might come into effect (e. g. Calciumchloride). Corrosion protection agents are required for the extraction of metal and scale dust. They avoid rusting. In case the dirty</p>	<p>air current contains acid producers such as sulphur dioxide, a neutralisation agent must be added. Dosing units for liquid additives can be obtained as accessories.</p>
<b>Additives</b>	<p>Depending on the quality of the substances to be separated, an addition of one or more additives can be required. A sample taking kit is issued alongside with each delivery in order to carry out a limitation by means of representative dust, water,</p>	<p>and/or sludge sample. The Oplax-P separating agent is also delivered which is sprayed on at the beginning of each cleaning, and simplifies the cleansing of adhering dust.</p>	<p><b>Following additives have proven in their worth:</b></p>
<b>Sedimentation auxiliaries</b>	<p>A flocculant can be added to the process water which accelerates or even ensures sedimentation with</p>	<p>dust, unable to sediment.</p>	
<b>Hardness stabilising agents</b>	<p>Sedimentation agents are often only effective if the process water in the wet separator shows a certain minimum hardness. Also, the</p>	<p>hardness may increase in the event of temperatures that are too high. Dosing via a dosing pump is therefore recommended.</p>	
<b>Defoaming agents</b>	<p>Corrosion protection agents shall be added to avoid rusting, especially with acid reactions of the materials to be separated. This is mainly requested for the dust extraction of</p>	<p>metal and scale dust. Dosing possible by means of a pump.</p>	
<b>Corrosion protection</b>	<p>Corrosion protection agents shall be added to avoid rusting, especially with acid reactions of the materials to be separated. This is mainly requested for the dust extraction of</p>	<p>metal and scale dust. Dosing possible by means of a pump.</p>	
<b>Biocide</b>	<p>A biocide is applied to prevent from propagation of bacteria (also legionella), germs, algae and resulting odor nuisance. Two various biocides shall be applied to avoid</p>	<p>bacterial resistances (see 42nd BImSchV)</p>	

## Separating agents

To simplify the cleansing of adherent dusts can be sprayed on a separating agent.

## Dosing device

Suitable dosing devices can be provided by Keller upon request.



# Venturi wet scrubber VDN



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