HES type (Hybrid scrubber with electrical dust collector)

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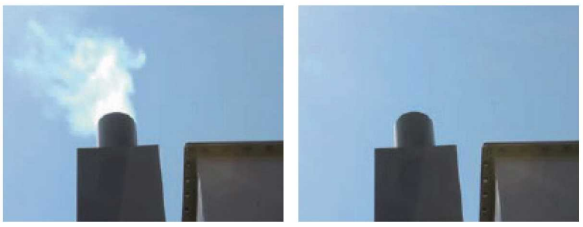
Features

❶Complete white smoke elimination and safe operation
❷Easy maintenance and inspection (almost maintenance free) and energy conservation (few running costs other than electricity costs)
❸Can be used with an existing scrubber (*or used alone).
❹The space requirement is cut to one third from conventional electrical dust collectors (thanks to a higher treatment speed).
❺Requires high-grade grounding work (Type A under Japanese laws) apart from the installation work.

HES type standard common specifications

Standard material	Upper compartment, electrode compartment, insulator compartment - C-FRP; mist catcher - PVC; conical unit and tank - FRP
Standard color	Rotary scrubber - Munsell 2.5G6/3 Main unit (upper/electrode/insulator compartments), conical unit and tank - Munsell N-7
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Scrubbing column pressure loss	300Pa
Machine noise level	82 to 87 dB (A) (a reference noise level at 1 m from the machine)
Allowable inlet temperature	40℃ max. with the standard design (80℃ max. with an optional design feature)
Scrubbing column pressure resistance	1500 Pa max.

Example of white smoke elimination

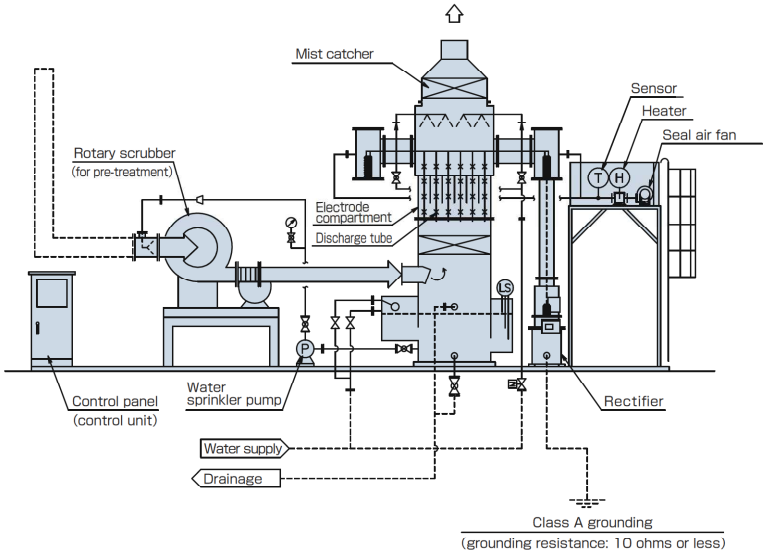


Removal ratio

Target substance	Chemical formula	Airflow velocity limit	Removal ratio
Acidic mist	H_2SO_4	1.5m/sec	97% or more
	HNO_3	1.5m/sec	97% or more
Acidic fume	NH_4Cl	1.0m/sec	97% or more
	SO_3	1.0m/sec	95 % or more
	$HClO_4$	1.0m/sec	95 % or more

* The reference removal ratios are given assuming the target substance concentration of 50 mg/Nm³ at the inlet.
* For information about the relationship between the target substance concentration at the inlet and the removal ratio, contact us.

Flow sheet



Compact design integrating dust collector with a gas scrubber

This is a compact hybrid scrubber system with an electrical dust collector. It puts together a gas scrubber unit that is designed to remove harmful gases by sprinkling water onto blower impeller blades with an electrical dust collector that is designed to remove white smoke particles by means of an electrical charge. It achieves a treatment speed about three times faster than conventional electrical dust collectors. The system is available with five airflow rate settings: 20, 50, 100, 150 and 200 m³/min. We also accept purchase of the electrical dust collector unit alone without the rotary scrubber unit. Feel free to consult us if you have a problem with the scrubber you already have, like white smoke coming out from the exhaust outlet. Please note that Class A grounding*1 is required for using this scrubber at your site.

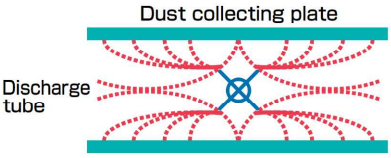
*1 :Class A grounding [a term used in Japanese laws]: grounding resistance of 10 ohms of less to be provided in the presence of DC voltage in the 35 to 50 kV range (50 kV = 50,000 V). A DC voltage of that level is in the category of "extra high voltage" under Japanese laws.

Advantages of low running costs and maintenance free

There are few running cost than the electricity costs. The pressure loss produced by the system is as small as 200 Pa or less. As a result, the blower can run on little power and requires no regular part replacement. The running costs are kept low. Thanks to the simple construction, the system is free of troubles like clogging, and offers ease of maintenance and inspection. The system employs discharge tubes (of the cross needle type), reducing the corona start voltage by 50 % compared with discharge wires. Moreover, they are free from the risk of breakage by sparks. Mist and fume adhering to the dust collecting plates are washed away by automatic intermittent sprinkling of water. The rectifier is given a very compact design.

Cross needle type discharge tubes

The use of cross needle type discharge electrodes eliminates the risk of trouble caused by the burnup of wire. Capable of forming a strong electric field, they contribute to the compact design and the stable maintaining of the electrical charge at a high voltage.



HEStype (Hybrid scrubber with electrical dust collector)

Dimensions

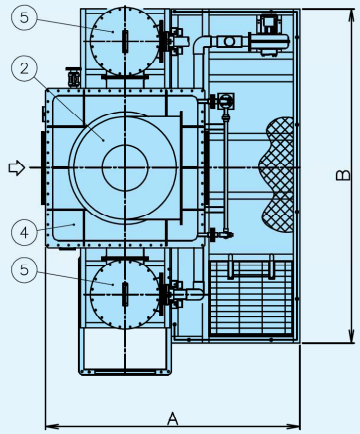
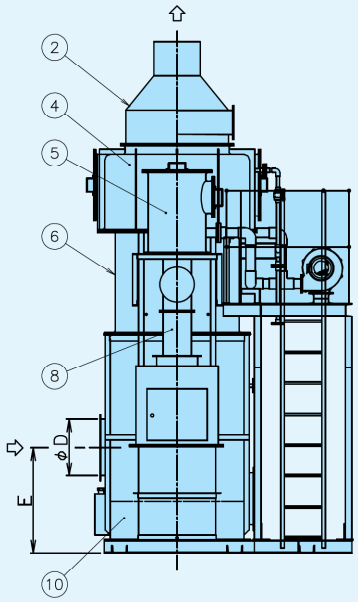
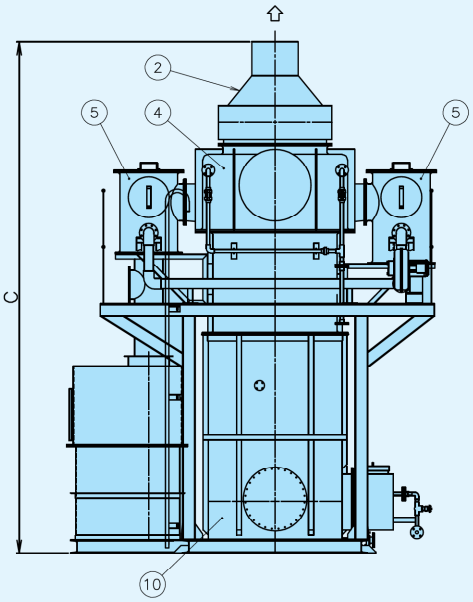


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Rotary scrubber	FRP	1	
2	Conical unit	FRP	1	
3	Mist catcher	PVC	1	
4	Upper compartment	C-FRP	1	
5	Insulator compartment	C-FRP	2	
6	Electrode compartment	C-FRP	1	
7	Discharge tube	SUS316L	(Note 1)	
8	Bus duct	C-FRP	1	
9	Bus bar	SGP	1	
10	Lower tank	FRP	1	

(Note 1) The number of discharge tubes depends on the airflow rate setting.
(Note 1) The standard material for discharge tubes is SUS316L.
If you are interested in the choice of SUS304 or Ti as discharge tube material, consult us.





Dimensions (unit: mm) of HES-20 - 200

Model	A	B	C	φD	E
HES-20	2200	2885	4550	250	800
HES-50	2350	3263	4960	400	950
HES-100	2450	3563	5771	500	1025
HES-150	2650	3766	5670	700	1125
HES-200	2850	3963	5930	800	1150

Standard specifications(electrical dust collector unit)

Model	Airflow rate (㎥/min)		Rectifier (kV × mA)	Upper compartment scrubbing liquid flow rate (L/min)	Seal air fan		Heater (kW)	Electric power consumption (kVA)
	Acidic fume	Acidic mist			Specifications	Motor (kW)		
HES-20	～20	～32	40 × 22	35	MAX 8.5㎥/min × MAX 5.7kPa	1.0	1.2	4.3
HES-50	21～35	33～55	40 × 22	52				4.3
HES-100	36～85	56～125	40 × 55	70				6.1
HES-150	86～115	126～175	40 × 55	87				6.1
HES-200	116～150	176～230	40 × 55	87				6.1

Standard specifications(rotary scrubber unit)

Model	Main unit			Circulation pump			
	Model	Specifications	Motor (kW)	Model	Discharge (L/min)	Pump head (m)	Motor (kW)
HES-20	SCF 201	20㎥/min × 1.4kPa	5.5	MEP-0401/0402	20	10	0.4
HES-50	SCF 251	50㎥/min × 1.4kPa	15	MEP-0401/0402	50	10	0.4
HES-100	SCF 301	100㎥/min × 1.4kPa	22	MEP-0403/0404	100	10	0.75

*If the airflow rate is 150 m3/min or more, this scrubber has to come after a pre-treatment unit or an existing scrubber. Consult us for details.