

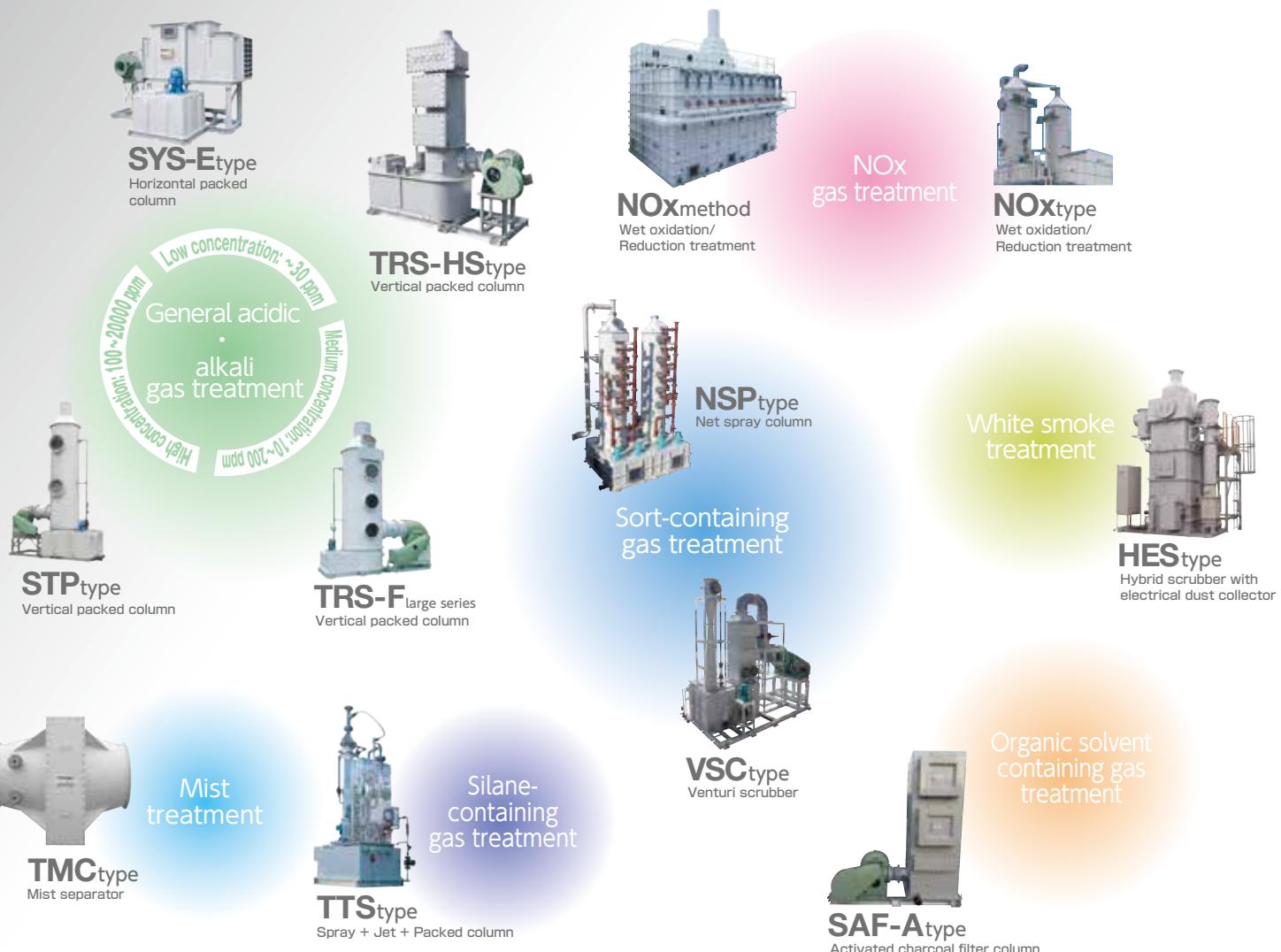
TEXEL®

Scrubbers and Exhaust
Gas Treatment Equipment



SEIKOW CHEMICAL ENGINEERING & MACHINERY, LTD.

Product lineup



Wet scrubber selection table

You are advised to select an off-gas scrubber of the right type from the table below in consideration of the gas type, concentration and exhaust flow rate.

Suitable scrubber types		
	Packed type	Non-filling type
General acidic/alkali gas treatment		
Low concentration : ~30ppm	TRS-HS type or SYS type	
Medium concentration : 10~200ppm	TRS-HS type, SYS type, TRS-F type or STP type	
High concentration : 200ppm~	STP type	NSP type (for use only at a small airflow rate)
Particle-containing gas treatment		NSP type (for use only at a small airflow rate) or VSC type
Special (silane-containing) gas treatment	TTS type (for use at a very small airflow rate up to 300 L/min.)	NSP type (for use only at a small airflow rate)
White smoke (acidic fume) treatment		HES type
		TMC type (called a "mist catcher")
NOx gas treatment	NOx type or STP type (reduction column only)	

Wet scrubber selection guide chart

Targeted gas concentration

High

Medium

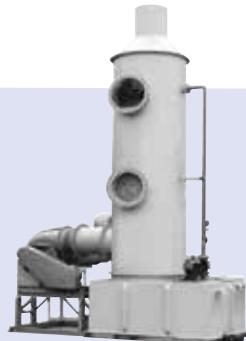
Low

Concentration ranges

- Low concentration : ~50ppm
- Medium concentration : 50~200ppm
- High concentration : 200ppm~



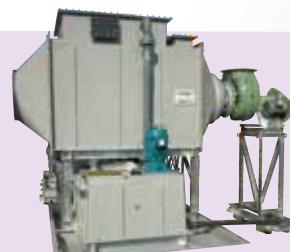
NSP type
Net spray column



STP type
Vertical packed column



TRS-HS type
Wet type packed column



SYS type
Horizontal packed column



TRS-F large series
Vertical packed column

Small

Large

Airflow rate

TRS-HS type (Vertical packed column)

Detailed spec.: page 9



Features

- ① Achieves a high removal ratio with small installation space requirements.
- ② Incorporates new design features for easier maintenance.
- ③ Allows cross connection at the water inlet.
- ④ A standards-compliant drain pan is available as an option.
- ⑤ Features special filler material and a spray nozzle.
- ⑥ The performance is improved by seven to ten percent from earlier models (*depending on the gas type).
- ⑦ The circulation tank is leak-free thanks to the bottom-integrated design.

TRS-HS type standard specifications

Standard material	Main unit and circulation tank - FRP; filler - PP; mist catcher - PVC
Standard color	Scrubbing column 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	450Pa
Machine noise level	78 to 81 dB(A) (a reference noise level at 1 m from the machine with a sirocco fan)
Allowable inlet temperature	40°Cmax. with standard design (80°Cmax. with optional design feature)
Scrubbing column pressure resistance	1500 Pa max.

Removal ratio

Gas name	Molecular formula	Scrubbing liquid	Removal ratio
Hydrogen chloride	HCl	H ₂ O	97% or more
Ammonia	NH ₃	H ₂ SO ₄	97% or more

* The scrubber may take care of gases and mists of other types as well.

(Note 1) The removal ratio for hydrogen chloride gas and ammonia gas is given assuming an original concentration of 100 ppm (max.) for each gas.

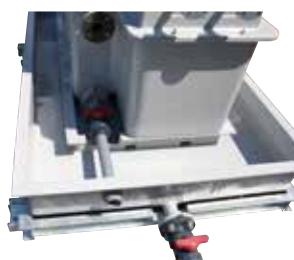
(Note 2) Achieving the intended removal ratio requires the satisfaction of the specified fresh water supply rate and scrubbing chemical liquid concentration.

(Note 3) For information about the removal of gas or mist of any other type, please contact us with specific information about the gas.

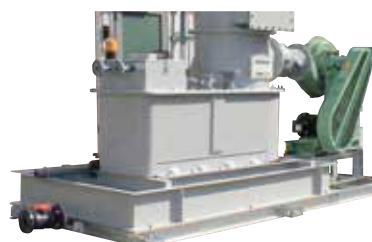


Option for TRS-HS type scrubber: drain pan

- The FRP drain pan is lightweight and cost-efficient thanks to the tank base integrated design
- The stainless steel drain pan (with FRP flake lining on the internal surface) comes with an inclined bottom plate.
- The drain pan can be made HF-resistant.
- The FRP drain pan has the smooth internal surface of an FRP molded product.
- The size can be changed upon request.
- Complies with the Water Pollution Control Law!



FRP model



Stainless steel model
(with an inclined bottom plate)

TRS-F large series (Vertical packed column)

Detailed spec.: page 10



Features

- ① Employs anti-corrosive molded FRP components.
- ② Employs a spiral nozzle that resists clogging.
- ③ The time for on-site assembly work may be reduced (by installing the pre-assembled unit so that the work at the site may be limited to making connections)

TRS-F type standard common specifications

Standard material	Main unit and circulation tank - FRP; filler - PP; mist catcher - PVC
Standard color	Scrubbing column and tank - Munsell N-7 Blower - Munsell 2.5G6/3
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Scrubbing column pressure loss	600Pa
Machine noise level	73 to 76 dB (A) (a reference noise level at 1 m from the machine)
Allowable inlet temperature	40°C max. with standard design (80°C max. with optional design feature)
Scrubbing column pressure resistance	1500 Pa max.

Removal ratio

Gas name	Molecular formula	Scrubbing liquid	Removal ratio
Hydrogen chloride	HCl	H ₂ O	90 % or more
Hydrogen fluoride	HF	H ₂ O	90 % or more
Ammonia	NH ₃	H ₂ SO ₄	95 % or more
Chlorine gas	Cl ₂	NaOH	90 % or more
Hydrogen sulfide	H ₂ S	NaOH	95 % or more
Sulfuric acid mist	H ₂ SO ₄	H ₂ O	90 % or more
Chromic acid mist	CrO ₃	H ₂ O	90 % or more

(Note 1) The removal ratios in the table are given assuming an original concentration of 100 ppm (max.) for each given gas.

(Note 2) The removal ratio may vary with the fresh water supply rate when scrubbing is done with water or with the NaOH concentration when scrubbing is done with NaOH.

(Note 3) A portion of HCl gas still remaining after the treatment may produce white smoke at the exhaust outlet under certain conditions depending on factors such as the gas concentration, outside temperature and humidity.

SYS type (Horizontal packed column)

Detailed spec.: page 11



Features

- ① Low Column height and compact
- ② Both of Push and Suction are available
- ③ Employs anti-corrosive molded FRP components

SYS type standard common specifications

Standard material	Main unit and circulation tank - FRP; filler - PVC; mist catcher - PVC
Standard color	Scrubbing column and tank - Munsell N-7 Blower - Munsell 2.5G6/3
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Scrubbing column pressure loss	300Pa
Machine noise level	78 to 81 dB(A)(a reference noise level at 1 m from the machine with a sirocco fan)
Allowable inlet temperature	40°C max. with standard design (80°C max. with optional design feature)
Scrubbing column pressure resistance	1,000 Pa max.

Removal ratio

Gas name	Molecular formula	Scrubbing liquid	Removal ratio
Hydrogen chloride	HCl	H ₂ O	90 % or more
Hydrogen fluoride	HF	H ₂ O	90 % or more
Ammonia	NH ₃	H ₂ SO ₄	90 % or more
Sulfur dioxide	SO ₂	NaOH	90 % or more
Hydrogen sulfide	H ₂ S	NaOH	90 % or more

(Note 1) The removal ratios in the table are given assuming an original concentration of 100 ppm (max.) for each given gas.

(Note 2) The removal ratio may vary with the fresh water supply rate when scrubbing is done with water.

(Note 3) A portion of HCl gas still remaining after the treatment may produce white smoke at the exhaust outlet under certain conditions depending on factors such as the gas concentration, outside temperature and humidity.

IHES type (Hybrid scrubber with electrical dust collector)

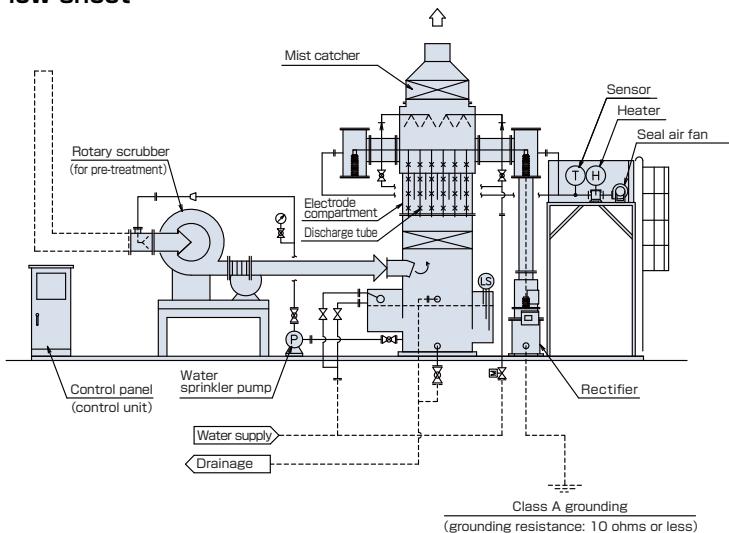
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Example of white smoke elimination



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.

Features

- ① Complete white smoke elimination and safe operation
- ② Easy maintenance and inspection (almost maintenance free) and energy conservation (few running costs other than electricity costs)
- ③ Can be used with an existing scrubber (*or used alone).
- ④ The space requirement is cut to one third from conventional electrical dust collectors (thanks to a higher treatment speed).
- ⑤ Requires high-grade grounding work (Type A under Japanese laws) apart from the installation work.

IHES 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°C max. with the standard design (80°C max. with an optional design feature)
Scrubbing column pressure resistance	1500 Pa max.

Removal ratio

Target substance	Chemical formula	Airflow velocity limit	Removal ratio
Acidic mist	H ₂ SO ₄	1.5m/sec	97% or more
	HNO ₃	1.5m/sec	97% or more
Acidic fume	NH ₄ Cl	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.

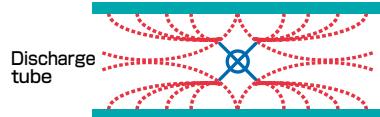
Advantages of low running costs and maintenance free

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

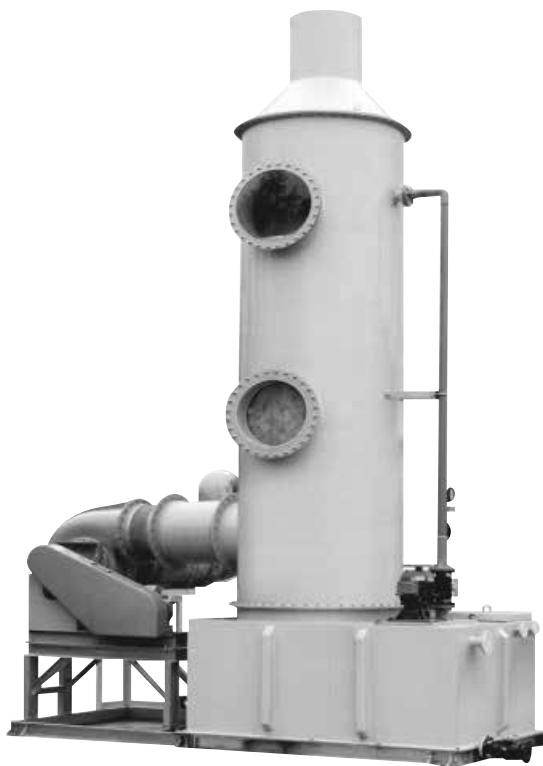
The use of cross needle type discharge electrodes eliminates the risk of trouble caused by the burnup of wire. Capable of forming a strong electric field, they contribute to the compact design and the stable maintaining of the electrical charge at a high voltage.

Dust collecting plate



ISTP type (Vertical packed column)

Detailed spec.: page 14



Features

- ① Ideal for the treatment of high concentration gases.
- ② Accepts design customization.
- ③ Realizes high removal ratio (95% or higher).

ISTP type standard common specifications

Standard material	Main unit and circulation tank - FRP; filler - PP; mist catcher - PVC
Standard color	Scrubbing column and tank - Munsell N-7 Blower - Munsell 2.5G6/3
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Scrubbing column pressure loss	600Pa
Machine noise level	73 to 76 dB (A) (a reference noise level at 1 m from the machine)
Allowable inlet temperature	40°C max. with standard design (80°C max. with optional design feature)
Scrubbing column pressure resistance	1500 Pa max.

Removal ratio

Gas name	Molecular formula	Scrubbing liquid	Removal ratio
Hydrogen chloride	HCl	H ₂ O	95~98%
Hydrogen fluoride	HF	H ₂ O	95~98%
Ammonia	NH ₃	H ₂ SO ₄	98~99%
Chlorine gas	Cl ₂	NaOH	95~98%
Hydrogen sulfide	H ₂ S	NaOH	98~99%
Sulfuric acid mist	H ₂ SO ₄	H ₂ O	95~98%
Chromic acid mist	CrO ₃	H ₂ O	95~98%

(Note 1) As the reference conditions, it is assumed that the gas temperature is in the normal range, the airflow rate is not higher than the design flow rate, and the targeted gas concentration at inlet is 50 to 500 ppm.

(Note 2) In ammonia gas removal, it is assumed that the scrubbing liquid maintains a pH value of 2.0 or lower.

(Note 3) In chlorine gas or hydrogen sulfide removal, it is assumed that the scrubbing liquid maintains a pH value of 12.5 or higher.

(Note 4) In sulfuric acid mist and chromic acid mist removal, the target mist particle size is 20 μm or greater.

(Note 5) A portion of HCl gas still remaining after the treatment may produce white smoke at the outlet under certain conditions depending on factors such as the gas concentration, outside temperature and humidity.

INOx type (Wet type reduction/oxidation column)



* NOx gas may be produced by the reaction between metal and nitric acid in processes like silicon wafer cleansing, metal cleansing and precious metal recovery through dissolution in semiconductor .

Features

- ① Reliably maintains a high performance.
- ② The improved filler achieves quicker treatment.
- ③ Reduced space requirement (67 % compared with our earlier model) and electricity consumption (63 % of our earlier model).
- * The above comparison with our earlier model is done assuming an airflow of 150 m³/min.

Options for NOx-A

Options Chemical liquid tank, pump, etc., are available as options.

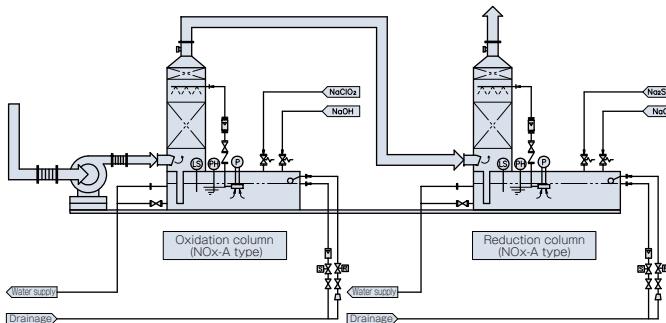
NOx-A type standard common specifications

Standard material	Main unit and circulation tank - FRP; filler - PE (oxidation column) and PP (reduction column); mist catcher - PVC
Standard color	Scrubbing column and tank - Munsell N-7 Blower - Munsell 2.5G6/3
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Scrubbing column pressure loss	500Pa
Machine noise level	73 to 76 dB (A) (a reference noise level at 1 m from the machine)
Allowable inlet temperature	40°C or lower
Scrubbing column pressure resistance	1500 Pa max.

Flow sheet

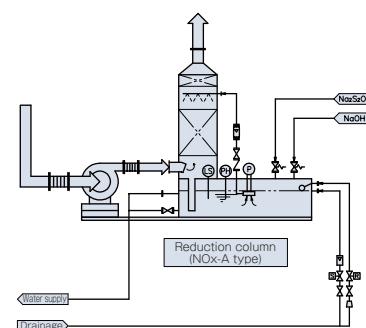
Two-column design
(oxidation column and reduction column)

Example of NOx removal ratio	
Concentration at the inlet	Concentration at the outlet
1000ppm (NO ₂ /NOX = 0.4~0.8)	150 ppm max.



One-column design
(reduction column)

Example of NOx removal ratio	
Concentration at the inlet	Concentration at the outlet
1000ppm (NO ₂ /NOX = 0.8 or more)	150 ppm max.

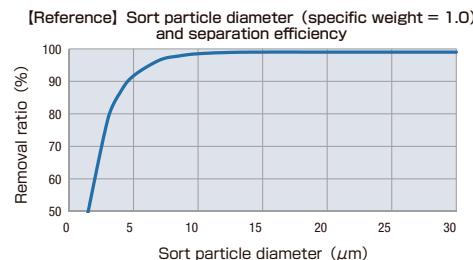


VSC type (Venturi scrubber)

Detailed spec.: page 15



Estimated relationship between the sort particle diameter and separation efficiency



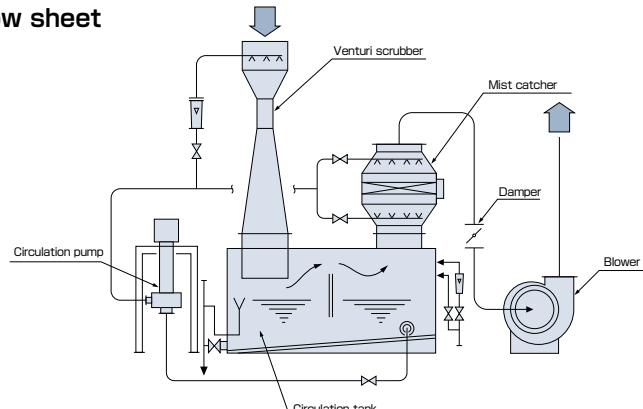
Features

- ① Removes particles at high efficiency.
- ② Removes particles and harmful gases at the same time.
- ③ The mist catcher is washable.

Examples of removal ratio

User	Company A	Company B	Company C
Sort particle concentration at inlet	0.448g/Nm ³	0.311g/Nm ³	0.034g/Nm ³
Sort particle concentration at outlet	0.004g/Nm ³	0.002g/Nm ³	Less than 0.001 g/Nm ³
Removal ratio	99.1%	99.4%	97% or more

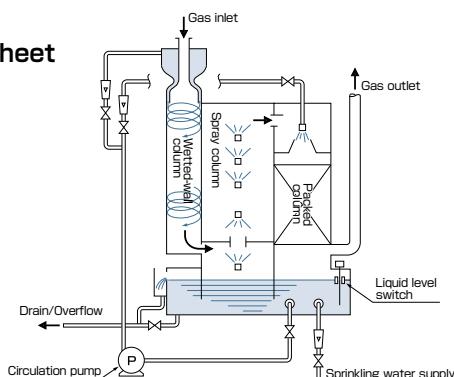
Flow sheet



TTS type (Special gas scrubber)



Flow sheet



Features

- ① Ideal for treating silane-containing gas from semiconductor production.
- ② Achieves an efficiency of 99.9 % or higher in the removal of gas from hydrolysis.
- ③ Maintenance is made easier.

Targeted gas(examples)

SiH₂Cl₂, dichlorosilane
SiHCl₃, trichlorosilane
HCl, hydrogen chloride

TTS type standard common specifications

Standard material	Main unit - PVC; circulation tank - FRP; filler - PP
Standard color	Tank - Munsell N-7
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Pressure loss from the main unit	300 Pa (main unit) (assuming the suction pressure of 500 Pa, given that γ, the specific weight of air, is 1.2 kg/m ³)
Allowable inlet temperature	40°C or lower

Removal ratio

Targeted gas	Removal ratio
SiCl ₄ , SiH ₂ Cl ₂ , HCl 5,000~10,000ppm	99.98%
SiHCl ₃ , HCl 110,000~260,000ppm	99.99%
SiH ₂ Cl ₂ , SiHCl ₃ , HCl 5,000~10,000ppm	99.98%

INSP type (Net spray column)

Detailed spec.: page 15



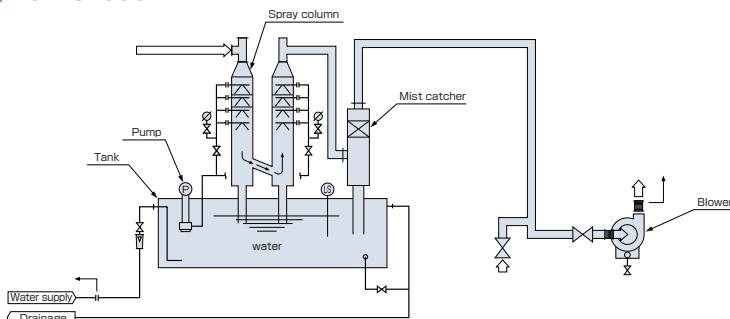
Features

- ① Highly efficient scrubbing of high concentration gas at a low flow rate.
- ② Easy maintenance.
The scrubber employs a nozzle design that resists clogging. The independent mist catcher column facilitates maintenance.
- ③ Can handle special gas from semiconductor production containing silica particles, etc.

INSP type standard common specifications

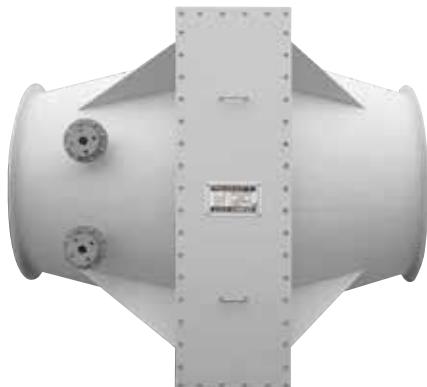
Standard material	Main unit and circulation tank - FRP; net - PVC
Standard color	Column - Munsell N-7 Blower - Munsell 2.5G6/3
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Pressure loss from the main unit	Main unit - 400 Pa
Allowable inlet temperature	40°C max. with standard design (80°C max. with optional design feature)

Flow sheet



ITMC-S/W type (Mist separator)

Detailed spec.: page 16



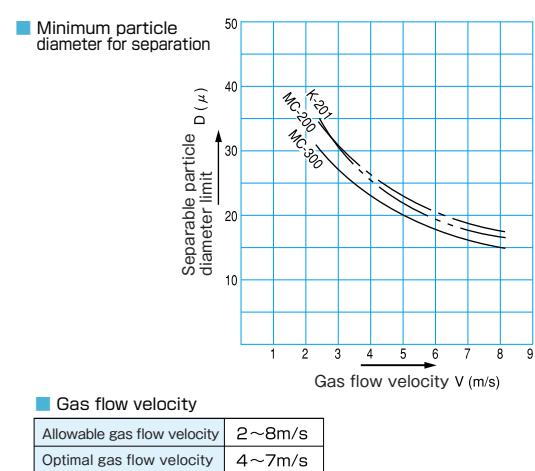
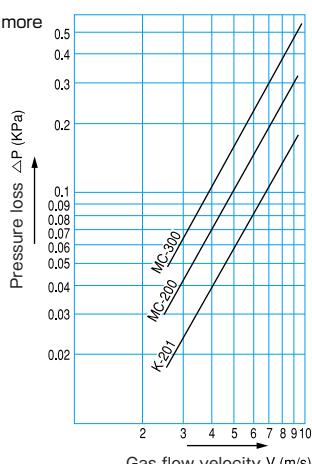
Features

- ① High separation efficiency.
- ② Low pressure loss from the system.
- ③ Highly anti-corrosive design.

ITMC type standard common specifications

Standard material	Main unit and circulation tank - FRP; Element - PVC (optionally HTPVC or PP)
Standard color	Main unit - Munsell N-7
Pressure loss from the main unit	300 Pa (single); 500 Pa (double)
Allowable inlet temperature	40°C max. with standard design (80°C max. with optional design feature)
Scrubbing column pressure resistance	1500 Pa max.

- Separation efficiency: 99 % or more
- Pressure loss



TRS-HType (Vertical packed column)

Dimensions

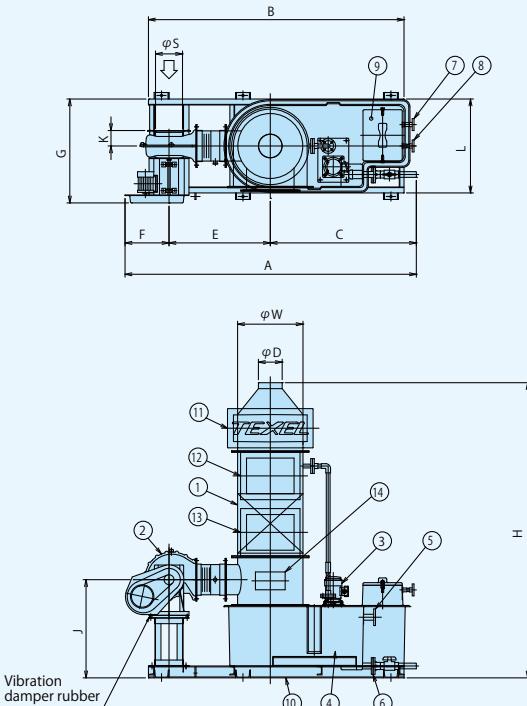


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Column unit	FRP	1	
2	Blower	FRPP (Note 1)	1	
3	Circulation pump	G-PP (Note 2)	1	
4	Circulation tank	FRP	1	
5	Overflow fitting	FRP	1	40A, JIS10K flange
6	Drain fitting	FRP	1	40A with PVC valve
7	Ball tap at the water inlet	PVC	1	20A, JIS10K flange
8	Water inlet	PVC	1	20A, JIS10K flange
9	Circulation tank inspection door	FRP	1	300 (W) x 400 (L) (Note 3)
10	Common base	SS400	1	Hot-dip galvanized
11	Mist catcher removal door	FRP	1	
12	Filler loading door	FRP	1	300W x 400H
13	Filler removal door	FRP	1	300W x 400H
14	Name plate	Acryl	1	

(Note 1) In the case of the model with a turbo fan, the fan casing is made of FRP and the impeller is made of G-PP or FRP upon request.

(Note 2) PP is used in the case of TRS-HS50 or greater.

(Note 3) The dimensions are 400 (W) x 400 (L) in the case of TRS-HS120 or larger.

Dimensions (unit: mm)

Model	A	B	C	ϕD	E	F	G	H	J	K	L	ϕS	ϕW
TRS-HS 25	2472	2150	1250	200	852	370	874	2481	825	130	790	268	550
TRS-HS 50	2815	2475	1335	300	1045	435	1121	2698	870	160	1040	320	800
TRS-HS 80	3130	2850	1425	400	1245	460	1273	2698	910	200	1240	422	1000
TRS-HS 120	3150	2870	1245	450	1445	460	1440	2698	910	200	1440	422	1200
TRS-HS 160	4125	4000	1345	550	1930	850	1710	2698	1275	330	1640	510	1400

(Note) With a sirocco fan

[Options]

Discharge flange, level meter, pH meter, chemical liquid inlet fitting, heater, damper, vibration isolated suction joint, vibration isolated blower stand, chemical liquid injection pump, chemical liquid tank, control panel, drain pan

(Note) A customized design for the change of material is required if HF gas, Cl₂ gas, chromic acid mist, solvent or the like has to be handled, or if the incoming gas is hot.

Standard specifications with a sirocco fan

Model	Airflow rate (m ³ /min)	Circulation pump				Blower				Tank capacity (L)	Weight	
		Model 50Hz/60Hz	Discharge (L/min)	Pump head (m) 50Hz/60Hz	Motor (kW) 50Hz/60Hz	Type	Airflow (m ³ /min)	Static pressure (kPa)	Motor (kW) 50Hz/60Hz		Product only (kg)	In operation (kg)
TRS-HS 25	~ 25	VSP-0251/0252	50	5.0	0.2/0.2	CES101	25	0.85	1.5/1.5	350	230	680
TRS-HS 50	26 ~ 53	VHP-0401/0402	100	4.5	0.4/0.4	CES151	53	0.85	2.2/2.2	600	320	1110
TRS-HS 80	54 ~ 83	VHP-0501/0502	160	5.5	0.4/0.4	CES201	83	0.85	3.7/3.7	820	430	1490
TRS-HS 120	84 ~ 120	VHP-0651/0652	230	4.5	0.75/0.75	CES201	120	0.85	3.7/3.7	900	490	1600
TRS-HS 160	121 ~ 165	VHP-0653/0654	310	5.5	0.75/1.5	NSF302	165	0.85	5.5/5.5	1140	715	2200

Standard specifications with a turbo fan

Model	Airflow rate (m ³ /min)	Circulation pump				Blower				Tank capacity (L)	Weight	
		Model 50Hz/60Hz	Discharge (L/min)	Pump head (m) 50Hz/60Hz	Motor (kW) 50Hz/60Hz	Type	Airflow (m ³ /min)	Static pressure (kPa)	Motor (kW) 50Hz/60Hz		Product only (kg)	In operation (kg)
TRS-HS 25	~ 25	VSP-0251/0252	50	5.0	0.2/0.2	CET151	25	1.2	1.5/1.5	350	265	720
TRS-HS 50	26 ~ 53	VHP-0401/0402	100	4.5	0.4/0.4	CET201	53	1.2	2.2/2.2	600	395	1180
TRS-HS 80	54 ~ 83	VHP-0501/0502	160	5.5	0.4/0.4	CET251	83	1.2	3.7/3.7	820	490	1555
TRS-HS 120	84 ~ 120	VHP-0651/0652	230	4.5	0.75/0.75	FTF303	120	1.2	5.5/5.5	900	615	1765
TRS-HS 160	121 ~ 165	VHP-0653/0654	310	5.5	0.75/1.5	FTF303	165	1.2	7.5/7.5	1140	770	2210

TRS-F large series (Vertical packed column)

Dimensions

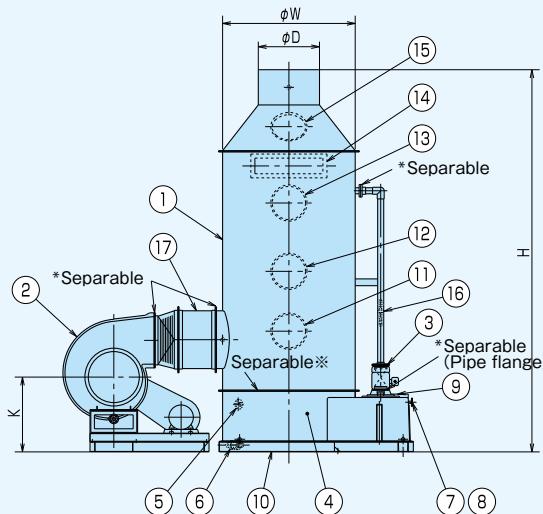
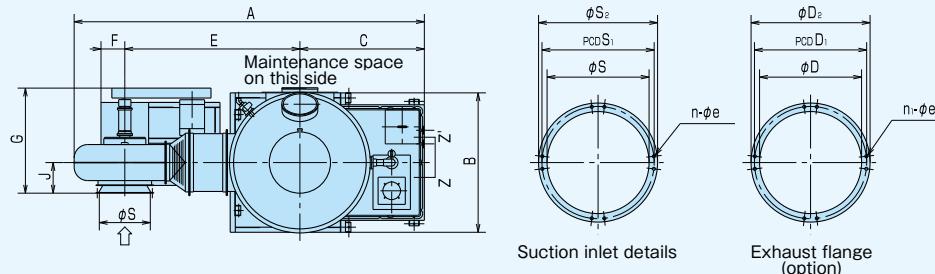


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Scrubbing column unit	FRP	1	
2	Blower	FRP	1	
3	Circulation pump	PP	1	
4	Circulation tank	FRP	1	
5	Overflow fitting	FRP	1	50A JIS10K (Note 1)
6	Drain fitting	FRP	1	50A with PVC valve (Note 1)
7	Ball tap at the water inlet	FRP	1	20A JIS10K
8	Water inlet	FRP	1	25A JIS10K
9	Circulation tank inspection door	FRP	1	500 x 500 (Note 2)
10	Base	SS400	1	Hot-dip galvanized
11	Scrubbing column entrance inspection door	FRP	1	With PVC lid
12	Filler removal door	FRP	1	With PVC lid
13	Sprinkler pipe inspection door/filler loading door	FRP	1	With PVC lid
14	Mist catcher removal door	FRP	1	1000 x 230
15	Mist catcher inspection door	FRP	1	With PVC lid
16	Pressure gauge	-	1	
17	Connecting duct	PVC	1	

(Note 1) 65A in the case of TRS-F600 - F800

(Note 2) 400 x 450 in the case of TRS-F200 and F250

Dimensions (unit: mm) of TRS-F200 - F800

Model	A	B	C	E	F	G	H	J	K	φD	φW	φS	PCDS1	φS2	n-φe	φD	PCDD1	φD2	n1-φe1
TRS-F200	4210	1500	1390	2110	290	1230	4955	380	975	650	1400	600	660	700	28-14	650	730	770	32-12
TRS-F250	4340	1650	1445	2185	290	1230	5055	380	1010	750	1550	600	660	700	28-14	750	830	870	36-12
TRS-F300	4485	1800	1515	2260	290	1230	5335	380	1175	800	1700	600	660	700	28-14	800	880	920	40-12
TRS-F400	5150	2050	1830	2575	350	1490	5595	450	1075	900	1950	750	810	850	32-12	900	980	1020	44-12
TRS-F500	5720	2300	1955	2875	425	1600	5835	500	1100	1000	2200	900	980	1020	40-14	1000	1080	1120	48-12
TRS-F600	5920	2500	2055	2975	425	1600	6070	500	1100	1100	2400	900	980	1020	44-14	1100	1180	1220	52-12
TRS-F700	6410	2700	2155	3225	475	1860	6300	580	1150	1200	2600	1050	1130	1170	44-14	1200	1280	1320	56-12
TRS-F800	6610	2900	2255	3325	475	1860	6450	580	1150	1300	2800	1050	1130	1170	44-14	1300	1380	1420	60-12

(Note) Values inside the dashed frame give dimensions of the optional exhaust flange.

TRS-F200 - F800 standard specifications

Model	Airflow rate (m³/min)	Water sprinkling rate (ℓ/min)	Circulation pump					Blower				Circulation tank capacity (ℓ)	Fresh water supply rate (ℓ/min)	Weight	
			Model 50Hz/60Hz	Pipe aperture (mm)	Discharge (ℓ/min)	Pump head (m)	Motor (kW) 50Hz/60Hz	Model 50Hz/60Hz	Airflow rate (m³/min)	Static pressure (kPa)	Motor (kW) 50Hz/60Hz			Product only (kg)	In operation (kg)
TRS-F200	160~210	320	VEM-0501/0502	50	340	8	1.5/2.2	FTF403-LL	200	1.5	11/11	1100	16.0	1210	2810
TRS-F250	211~263	400	VEM-0503/0502	50	420	8	2.2/2.2	FTF403-LL	250	1.5	11/11	1240	19.0	1320	3120
TRS-F300	264~315	480	VEM-0651/0652	65	500	8	2.2/3.7	FTF403-LL	300	1.5	15/15	1800	23.0	1540	3990
TRS-F400	316~420	640	VEM-0803/0802	80	690	8	5.5/5.5	FTF503-LL	400	1.5	18.5/18.5	2300	31.0	2050	5230
TRS-F500	421~525	800	VEM-0803/0802	80	840	8	5.5/5.5	FTF603-LL	500	1.5	18.5/22	2760	39.0	2420	6300
TRS-F600	526~630	960	VEM-1001/1002	100	1000	8	5.5/7.5	FTF603-LL	600	1.5	30/30	3110	47.0	2630	7500
TRS-F700	631~735	1120	VEM-1001/1002	100	1180	8	5.5/7.5	FTF703-LL	700	1.5	30/30	3490	54.0	3150	8300
TRS-F800	736~840	1280	VEM-1003/1002	100	1340	8	7.5/7.5	FTF703-LL	800	1.5	37/37	3900	62.0	3390	9000

SYS-Dtype (Horizontal packed column)

Dimensions

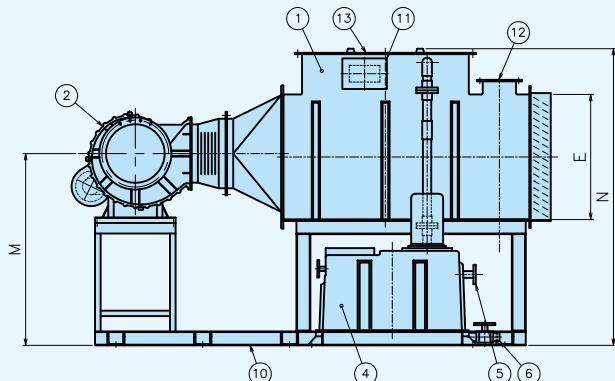
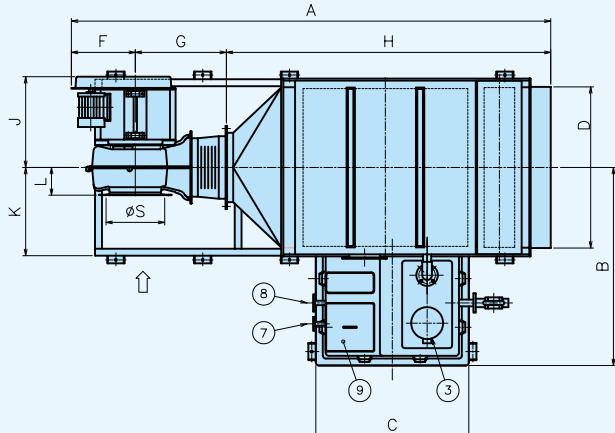


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Scrubbing column unit	FRP	1	
2	Blower	FRP	1	
3	Circulation pump	PP	1	
4	Circulation tank	FRP	1	
5	Overflow fitting	FRP	1	40A JIS10kF
6	Drain fitting	FRP	1	40A with PVC valve
7	Ball tap at the water inlet	FRP	1	20A JIS10kF
8	Water inlet	FRP	1	25A JIS10kF
9	Circulation tank inspection door	FRP	1	
10	Common base	FRP	1	Hot-dip galvanized
11	Sprinkler pipe inspection door	FRP	1	With PVC lid
12	Mist catcher removal door	FRP	1	
13	Filler removal door	FRP	1	

Dimensions (unit: mm) of SYS-E20D - 150D

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	ØS	PCDS1	ØS2	n-Øe
SYS-E 20D	2965	1100	1050	560	420	370	415	2180	479	335	130	1130	1640	268	322	358	12-10
SYS-E 40D	3100	1100	1050	560	720	435	485	2180	601	335	160	1280	1935	320	382	421	16-12
SYS-E 60D	3234	1275	1100	860	720	435	570	2229	601	485	160	1280	1935	320	382	421	16-12
SYS-E 80D	3359	1275	1100	860	920	460	670	2229	653	485	200	1380	2135	422	482	520	20-14
SYS-E 100D	3465	1425	1100	1160	920	460	670	2335	653	635	200	1380	2135	422	482	520	20-14
SYS-E 150D	3577	1425	1100	1160	1220	507	735	2335	890	635	330	1210	2435	510	590	640	24-14

SYS-E20D - 150D standard specifications

Model	Airflow rate (m³/min)	Circulation pump					Blower				Circulation tank capacity (ℓ)	Fresh water supply rate (ℓ/min)	Weight	
		Model 50Hz/60Hz	Pipe aperture (mm)	Discharge (ℓ/min)	Pump head (m)	Motor (kW) 50Hz/60Hz	Type	Airflow (m³/min)	Static pressure (kPa)	Motor (kW)			Product only (kg)	In operation (kg)
SYS-E 20D	~ 20	VEM-0401/0402	40	160	7	0.75/1.5	CES-101RL	20	0.75	0.75	250	1.5	500	810
SYS-E 40D	21 ~ 40	VEM-0401/0402	40	160	7	0.75/1.5	CES-151RL	40	0.75	1.5	250	3.0	550	860
SYS-E 60D	41 ~ 60	VEM-0501/0502	50	320	7	1.5/2.2	CES-151RL	60	0.75	2.2	360	4.5	700	1210
SYS-E 80D	61 ~ 80	VEM-0501/0502	50	320	7	1.5/2.2	CES-201RL	80	0.75	2.2	360	6.0	740	1250
SYS-E 100D	81 ~ 100	VEM-0501/0502	50	400	7	1.5/2.2	CES-201RL	100	0.75	3.7	450	8.0	790	1420
SYS-E 150D	101 ~ 150	VEM-0651/0652	65	600	7	2.2/3.7	NSF-302LL	150	0.75	5.5	450	12.0	1010	1730

SYS-S type (Horizontal packed column)

Dimensions

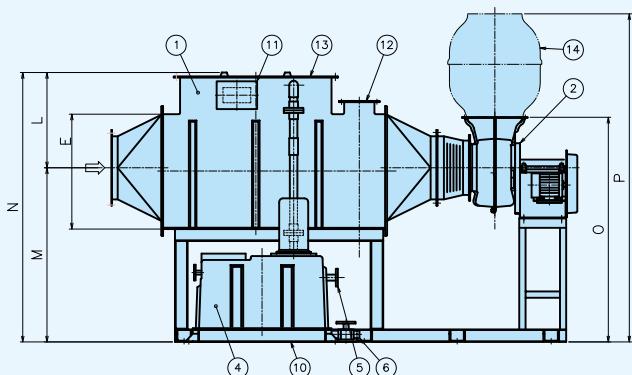
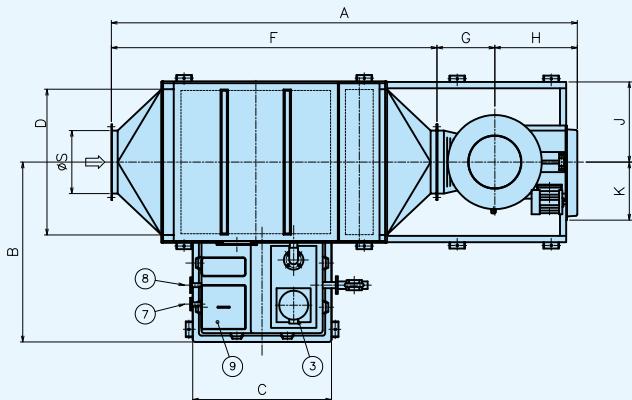


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Scrubbing column unit	FRP	1	
2	Blower	FRP	1	
3	Circulation pump	PP	1	
4	Circulation tank	FRP	1	
5	Overflow fitting	FRP	1	40A JIS10kF
6	Drain fitting	FRP	1	40A with PVC valve
7	Ball tap at the water inlet	FRP	1	20A JIS10kF
8	Water inlet	FRP	1	25A JIS10kF
9	Circulation tank inspection door	FRP	1	
10	Common base	FRP	1	Hot-dip galvanized
11	Sprinkler pipe inspection door	FRP	1	With PVC lid
12	Mist catcher inspection door	FRP	1	
13	Filler removal door	FRP	1	
14	Ventilator	FRP	1	Options

Dimensions (unit: mm) of SYS-E20S - 150S

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	ϕS	PCDS1	$\phi S2$	$n \cdot \phi e$
SYS-E 20S	3074	1100	1050	560	410	2280	315	479	335	370	510	1130	1640	1360	1895	250	322	358	12-10
SYS-E 40S	3226	1100	1050	560	710	2280	345	601	335	435	655	1280	1935	1580	2200	300	382	419	16-12
SYS-E 60S	3409	1275	1100	850	710	2378	430	601	485	435	655	1280	1935	1580	2200	400	482	521	20-14
SYS-E 80S	3501	1275	1100	850	910	2378	470	653	485	460	755	1380	2135	1780	2600	450	540	591	24-14
SYS-E 100S	3703	1425	1100	1150	910	2580	470	653	635	460	755	1380	2135	1780	2600	500	590	640	24-14
SYS-E 150S	4055	1425	1100	1150	1215	2580	585	890	635	865	905	1530	2435	2010	3035	600	680	720	32-12

SYS-E20S - 150S standard specifications

Model	Airflow rate (m³/min)	Circulation pump					Blower				Circulation tank capacity	Fresh water supply rate (l/min)	Weight	
		Model 50Hz/60Hz	Pipe aperture (mm)	Discharge (l/min)	Pump head (m)	Motor (kW) 50Hz/60Hz	Type	Airflow (m³/min)	Static pressure (kPa)	Motor (kW)			Product only (kg)	In operation (kg)
SYS-E 20S	~ 20	VEM-0401/0402	40	160	7	0.75/1.5	CES-101RH	20	0.75	0.75	250	1.5	480	790
SYS-E 40S	21 ~ 40	VEM-0401/0402	40	160	7	0.75/1.5	CES-151RH	40	0.75	1.5	250	3.0	520	830
SYS-E 60S	41 ~ 60	VEM-0501/0502	50	320	7	1.5/2.2	CES-151RH	60	0.75	2.2	360	4.5	650	1160
SYS-E 80S	61 ~ 80	VEM-0501/0502	50	320	7	1.5/2.2	CES-201RH	80	0.75	2.2	360	6.0	720	1230
SYS-E 100S	81 ~ 100	VEM-0501/0502	50	400	7	1.5/2.2	CES-201RH	100	0.75	3.7	450	8.0	760	1390
SYS-E 150S	101 ~ 150	VEM-0651/0652	65	600	7	2.2/3.7	NSF-302RH	150	0.75	5.5	450	12.0	1030	1750

HEType (Hybrid scrubber with electrical dust collector)

Dimensions

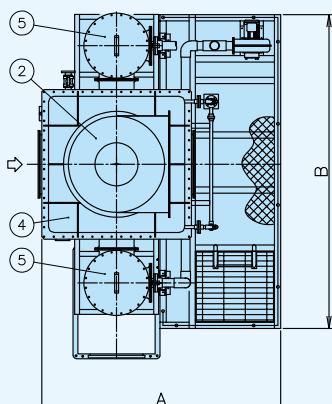
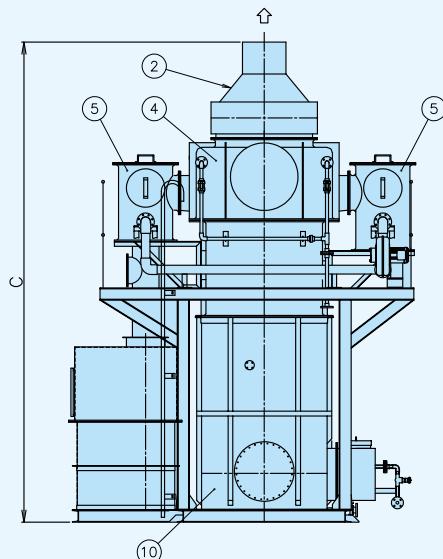
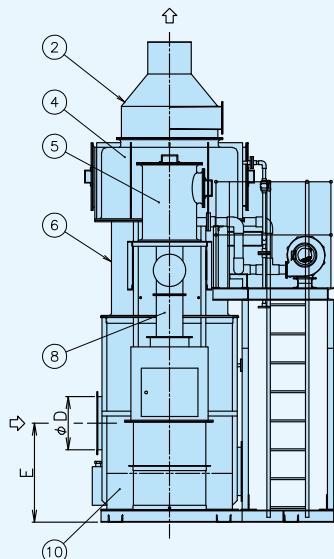


Table of materials

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 (m³/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 8.5m³/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	20m³/min × 1.4kPa	5.5	MEP-0401/0402	20	10	0.4
HES-50	SCF 251	50m³/min × 1.4kPa	15	MEP-0401/0402	50	10	0.4
HES-100	SCF 301	100m³/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.

STPtype (Vertical packed column)

Dimensions

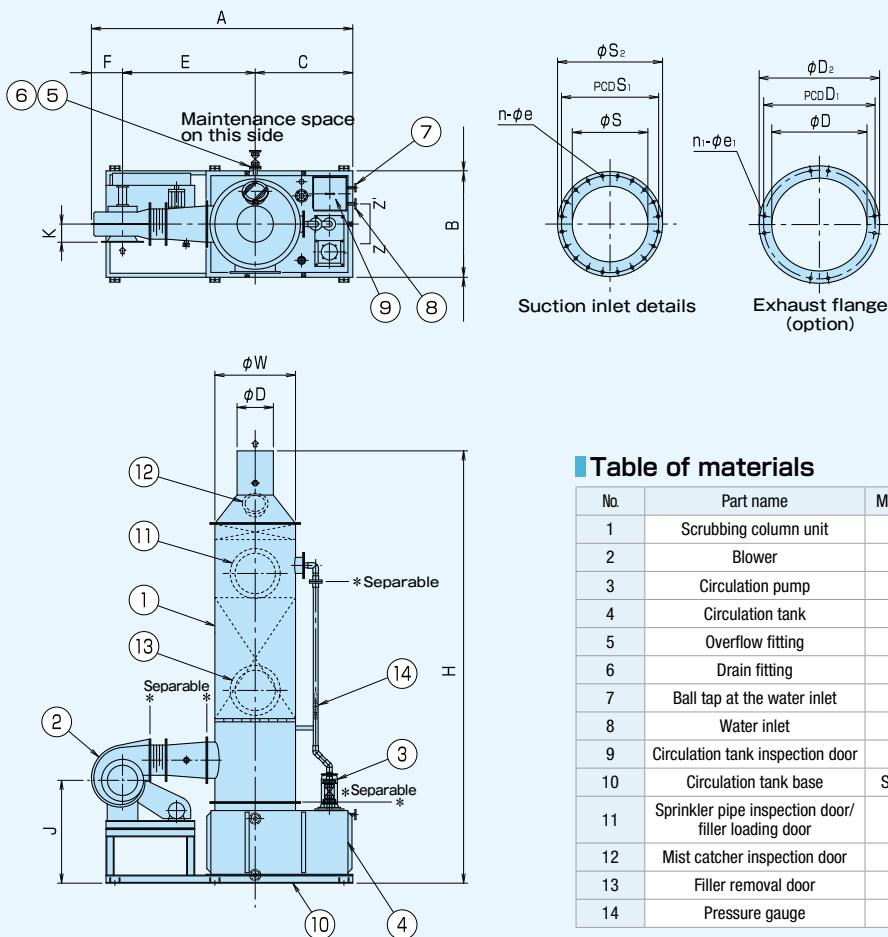


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Scrubbing column unit	FRP	1	
2	Blower	FRP	1	
3	Circulation pump	PP	1	
4	Circulation tank	FRP	1	
5	Overflow fitting	FRP	1	40A JIS10kF
6	Drain fitting	FRP	1	40A with PVC valve
7	Ball tap at the water inlet	FRP	1	20A JIS10kF
8	Water inlet	FRP	1	25A JIS10kF
9	Circulation tank inspection door	FRP	1	
10	Circulation tank base	SS400	1	Hot-dip galvanized
11	Sprinkler pipe inspection door/filler loading door	FRP	1	With PVC lid
12	Mist catcher inspection door	FRP	1	With PVC lid
13	Filler removal door	FRP	1	With PVC lid
14	Pressure gauge	-	1	

Dimensions (unit: mm) of STP-20 - 120

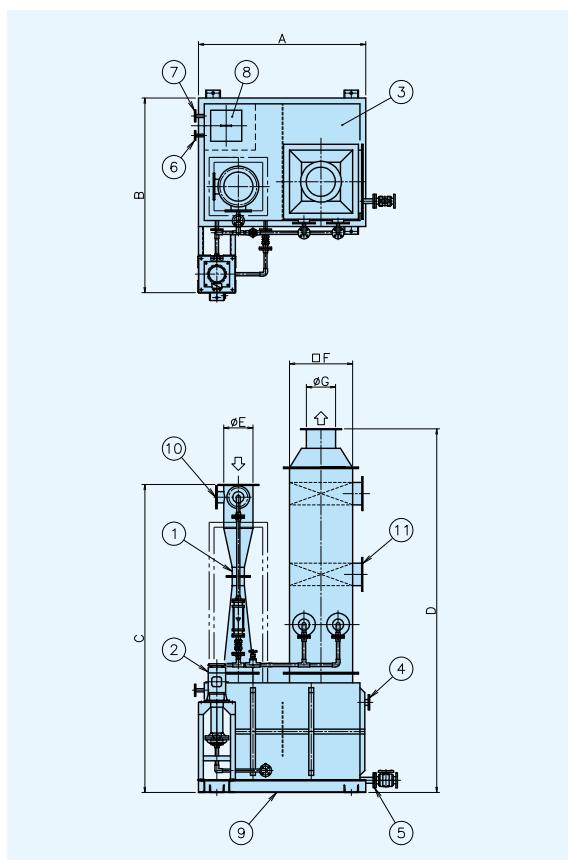
Model	A	B	C	E	F	H	J	K	φD	φW	φS	PCDS1	φS2	n-φe	φD	PCDD1	φD2	n1-φe1
STP- 20	2475	1020	1110	1120	245	4610	1225	135	250	600	225	264	297	12-10	250	321	360	12-12
STP- 40	2904	1020	1210	1380	314	4860	1225	180	350	800	300	419	419	16-12	350	432	470	16-12
STP- 60	3241	1320	1210	1645	386	5360	1275	225	450	1000	375	521	521	20-14	450	540	590	24-12
STP- 90	3441	1420	1310	1745	386	5480	1275	225	450	1200	375	521	521	20-14	450	540	590	24-12
STP-120	3977	1620	1510	2000	467	5760	1275	326	550	1400	450	591	591	24-14	550	580	620	28-12

STP-20 - 120 standard common specifications

Model	Airflow rate (m³/min)	Circulation pump					Blower				Circulation tank capacity (l)	Fresh water supply rate (l/min)	Weight	
		Model 50Hz/60Hz	Pipe aperture (mm)	Discharge (l/min)	Pump head (m)	Motor (kW) 50Hz/60Hz	Model 50Hz/60Hz	Airflow rate (m³/min)	Static pressure (kPa)	Motor (kW) 50Hz/60Hz			Product only (kg)	In operation (kg)
STP- 20	15~25	VEM-0403/0402	40	100	15	1.5/1.5	FTF-153LL	20	1.6	1.5/1.5	750	6.0	620	1500
STP- 40	26~45	VEM-0403/0402	40	200	15	1.5/1.5	FTF-203LL	40	1.6	2.2/2.2	850	12.0	800	1840
STP- 60	46~70	VEM-0503/0502	50	300	15	2.2/2.2	FTF-253LL	60	1.6	3.7/3.7	1200	17.0	980	2450
STP- 90	71~100	VEM-0503/0502	50	350	13	2.2/2.2	FTF-253LL	90	1.6	5.5/5.5	1400	26.0	1180	2920
STP-120	101~135	VEM-0653/0652	65	500	15	3.7/3.7	FTF-303LL	120	1.6	7.5/7.5	1900	35.0	1510	3880

VSCtype (Venturi scrubber)

Dimensions



Dimensions (unit: mm)

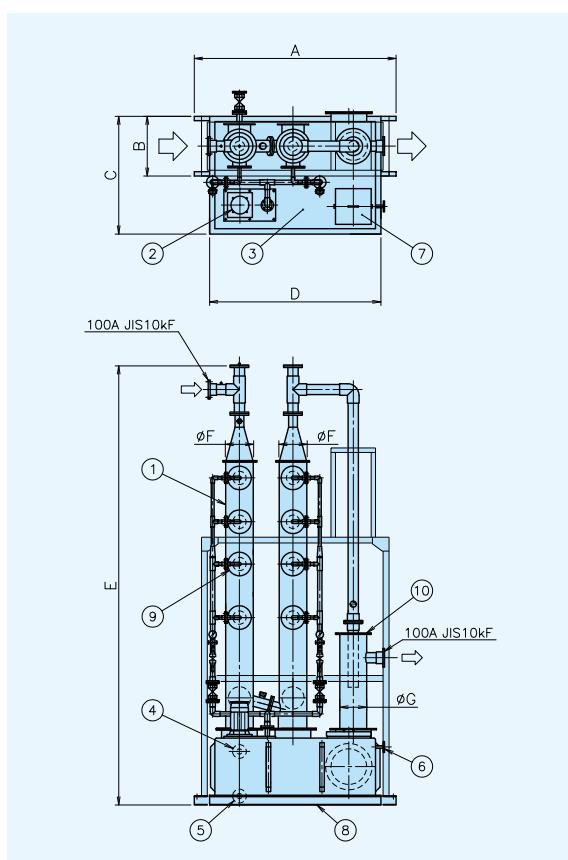
Model	A	B	C	D	ϕE	ϕF	ϕG
VSC-20	1570	1800	2650	3335	200	500	200
VSC-30	1570	1800	3225	3335	250	500	250
VSC-40	1620	2000	3013	3335	250	500	250
VSC-60	1720	2000	3588	3335	300	650	300
VSC-80	2120	2000	3950	3335	350	750	350
VSC-100	2320	2000	4300	3535	400	850	400
VSC-120	2420	2100	4925	3535	450	850	450
VSC-150	2520	2200	5550	3535	500	1050	500
VSC-180	2620	2300	5700	3535	550	1050	550
VSC-220	2820	2500	6375	3635	600	1200	600
VSC-270	2920	2800	6525	3635	650	1350	650
VSC-300	3120	2920	7150	3635	700	1450	700

Table of materials

No.	Part name	Material	Quantity	Remarks
1	Main unit	FRP	1	
2	Circulation pump	PP	1	
3	Circulation tank	FRP	1	
4	Overflow fitting	FRP	1	50A JIS10kF
5	Drain fitting	FRP	1	50A with PVC valve
6	Ball tap at the water inlet	FRP	1	20A JIS10kF
7	Water inlet	FRP	1	25A JIS10kF
8	Circulation tank inspection door	FRP	1	
9	Common base	SS400	1	Hot-dip galvanized
10	Sprinkler pipe inspection door	FRP	1	
11	Mist catcher removal door	FRP	2	

NSPtype (Net spray column)

Dimensions



Dimensions (unit: mm)

Model	A	B	C	D	E	ϕF	ϕG
NSP-300M	2260	670	1320	1920	4920	300	300
NSP-400M	2460	820	1520	2120	5110	400	300
NSP-500M	2860	970	1720	2520	5720	500	300
NSP-600M	3060	1070	1820	2720	5900	600	300
NSP-700M	3160	1120	1920	2820	6125	700	300
NSP-800M	3360	1170	2120	3020	6295	800	300
NSP-900M	3850	1320	2220	3270	6495	900	300
NSP-1000M	4050	1420	2320	3470	6680	1000	300

Table of materials

No.	Part name	Material	Quantity	Remarks
1	Main unit	FRP	1	
2	Circulation pump	PP	1	
3	Circulation tank	FRP	1	
4	Overflow fitting	FRP	1	40A JIS10kF
5	Drain fitting	FRP	1	40A with PVC valve
6	Water inlet	FRP	1	25A JIS10kF
7	Circulation tank inspection door	FRP	1	
8	Common base	SS400	1	Hot-dip galvanized
9	Sprinkler pipe entrance / inspection door	PVC	8	
10	Mist trap	FRP	1	

TMC-S/Wtype (Mist separator)

Dimensions

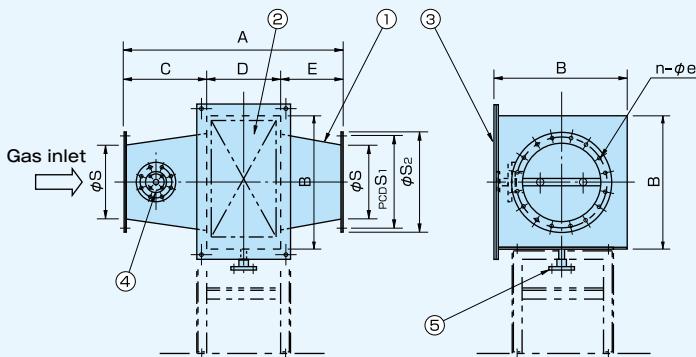


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Housing	FRP	1	
2	Element	PVC	1	The material is PP with K-201. (* *)
3	Element removal door	FRP	1	The quantity is two in the case of Model 450 or greater.
4	Scrubbing water inlet	PVC	1	The quantity is two in the case of Models 100 through 300, three in the case of Models 450 through 800.
5	Drain fitting	FRP	1	The quantity is two in the case of Models 600 and 800.

* Option: stand (made of SS400)

* * The element is split into two parts with Models 200 and 300, into four parts with Models 450 and 600, into six parts with Model 800.

Airflow rate and dimensions of single type units

Model	Airflow rate (m³/min)	A mm	B mm	C mm	D mm	E mm	φ S mm	PCDS1 mm	φ S2 mm	n- φ e Number- φ	Pressure loss (kPa)	Weight (kg)	Liquid flow rate during scrubbing (ℓ/min)	Water inlet Aperture size × number	Drain fitting Aperture size × number
TMC-S-25	17 ~ 25	1050	500	400	350	300	250	322	358	12-10	0.3	30	7	20 × 1	40 × 1
TMC-S-35	26 ~ 45	1050	560	400	350	300	300	382	419	16-12	0.3	35	7	20 × 1	40 × 1
TMC-S-50	46 ~ 55	1050	630	400	350	300	370	432	471	16-12	0.3	40	7	20 × 1	40 × 1
TMC-S-80	56 ~ 85	1250	710	500	350	400	420	482	521	20-12	0.3	50	14	20 × 1	40 × 1
TMC-S-100	86 ~ 120	1250	810	500	350	400	500	590	641	24-12	0.3	65	21	25 × 2	40 × 1
TMC-S-150	121 ~ 175	1500	930	700	350	450	600	670	720	32-12	0.3	85	28	25 × 2	50 × 1
TMC-S-200	176 ~ 230	1600	1140	700	360	540	700	770	820	36-12	0.3	115	60	40 × 2	80 × 1
TMC-S-300	231 ~ 350	1900	1300	900	360	640	800	870	920	40-12	0.3	160	80	40 × 2	80 × 1
TMC-S-450	351 ~ 450	2050	1600	900	360	790	950	1020	1070	46-12	0.3	245	140	40 × 3	100 × 1
TMC-S-600	451 ~ 600	2250	1830	1000	360	890	1150	1220	1270	56-12	0.3	315	200	40 × 3	100 × 2
TMC-S-800	601 ~ 840	2550	2150	1200	360	990	1250	1320	1370	64-12	0.3	420	280	40 × 3	100 × 2

(Note 1) With element MC-300, the pressure loss is 0.10 kPa more.

(Note 2) With a TMC-S type unit, do not perform scrubbing during its operation because mist content is re-sprinkled.

Dimensions

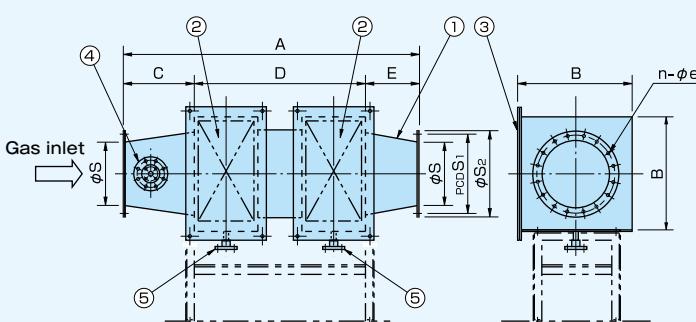


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Housing	FRP	1	
2	Element	PVC	1	The material is PP with K-201. (* *)
3	Element removal door	FRP	2	The quantity is four in the case of Model 450 or greater.
4	Scrubbing water inlet	PVC	1	The quantity is two in the case of Models 100 through 300, three in the case of Models 450 through 800.
5	Drain fitting	FRP	2	The quantity is four in the case of Models 600 and 800.

* Option: stand (made of SS400)

** The element is split into two parts with Models 200 and 300, into four parts with Models 450 and 600, into six parts with Model 800.

Airflow rate and dimensions of double type units

Model	Airflow rate (m³/min)	A mm	B mm	C mm	D mm	E mm	φ S mm	P S1 mm	φ S2 mm	n- φ e Number- φ	Pressure loss (kPa)	Pressure loss during scrubbing (kPa)	Weight (kg)	Liquid flow rate during scrubbing (ℓ/min)	Water inlet Aperture size × number	Drain fitting Aperture size × number
TMC-W-25	17 ~ 25	1650	500	400	950	300	250	322	358	12-10	0.5	0.6	55	7.0	20 × 1	40 × 2
TMC-W-35	26 ~ 45	1650	560	400	950	300	300	382	419	16-12	0.5	0.6	65	7.0	20 × 1	40 × 2
TMC-W-50	46 ~ 55	1650	630	400	950	300	370	432	471	16-12	0.5	0.6	75	7.0	20 × 1	40 × 2
TMC-W-80	56 ~ 85	1850	710	500	950	400	420	482	521	20-12	0.5	0.6	90	14.0	20 × 1	40 × 2
TMC-W-100	86 ~ 120	1850	810	500	950	400	500	590	641	24-12	0.5	0.6	115	21.0	25 × 2	40 × 2
TMC-W-150	121 ~ 175	2100	930	700	950	450	600	670	720	32-12	0.5	0.6	145	28.0	25 × 2	50 × 2
TMC-W-200	176 ~ 230	2200	1140	700	960	540	700	770	820	36-12	0.5	0.6	200	60.0	40 × 2	80 × 2
TMC-W-300	231 ~ 350	2500	1300	900	960	640	800	870	920	40-12	0.5	0.6	270	80.0	40 × 2	80 × 2
TMC-W-450	351 ~ 450	2700	1600	900	1010	790	950	1020	1070	46-12	0.5	0.6	410	140.0	40 × 3	100 × 2
TMC-W-600	451 ~ 600	2900	1830	1000	1010	890	1150	1220	1270	56-12	0.5	0.6	525	200.0	40 × 3	100 × 4
TMC-W-800	601 ~ 840	3200	2150	1200	1010	990	1250	1320	1370	64-12	0.5	0.6	685	280.0	40 × 3	100 × 4

(Note 1) With element MC-300, the pressure loss is 0.20 kPa more.

ISAF-A type (Activated charcoal filter column)

Detailed spec.: page 18



Filter photo

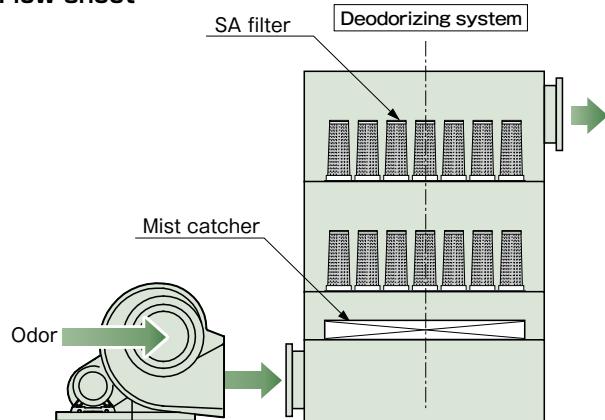
Features

- ① Uses easily replaceable cartridge type filter.
- ② Uses TEXELCOAL as an absorber, capable of removing composite odor by its use alone.
- ③ The low pressure loss from the unit minimizes the power consumed by the blower.

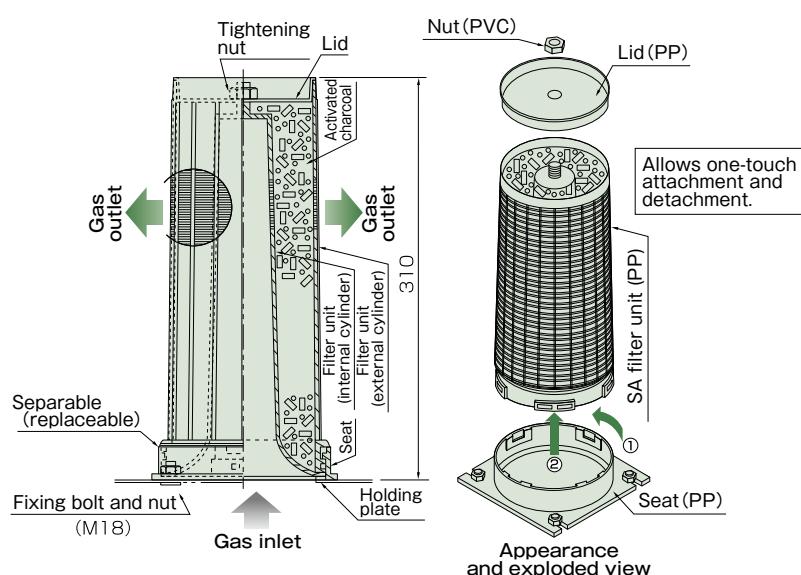
ISAF type standard common specifications

Standard material	Column unit - FRP; mist catcher - PVC; Activated charcoal filter - PP
Standard color	Column unit - Munsell N-7 Blower - Munsell 2.5G6/3
Standard motor	Totally enclosed fan cooled motor for outdoor installation, 200/220 V, 50/60 Hz
Pressure loss from the main unit	300Pa
Machine noise level	73 to 76 dB (A) (a reference noise level at 1 m from the machine)
Allowable inlet temperature	40°C or lower
Pressure loss outside the unit	1,000 Pa max

Flow sheet



Activated charcoal filter structure



SAF-Atype (Activated charcoal filter column)

Dimensions

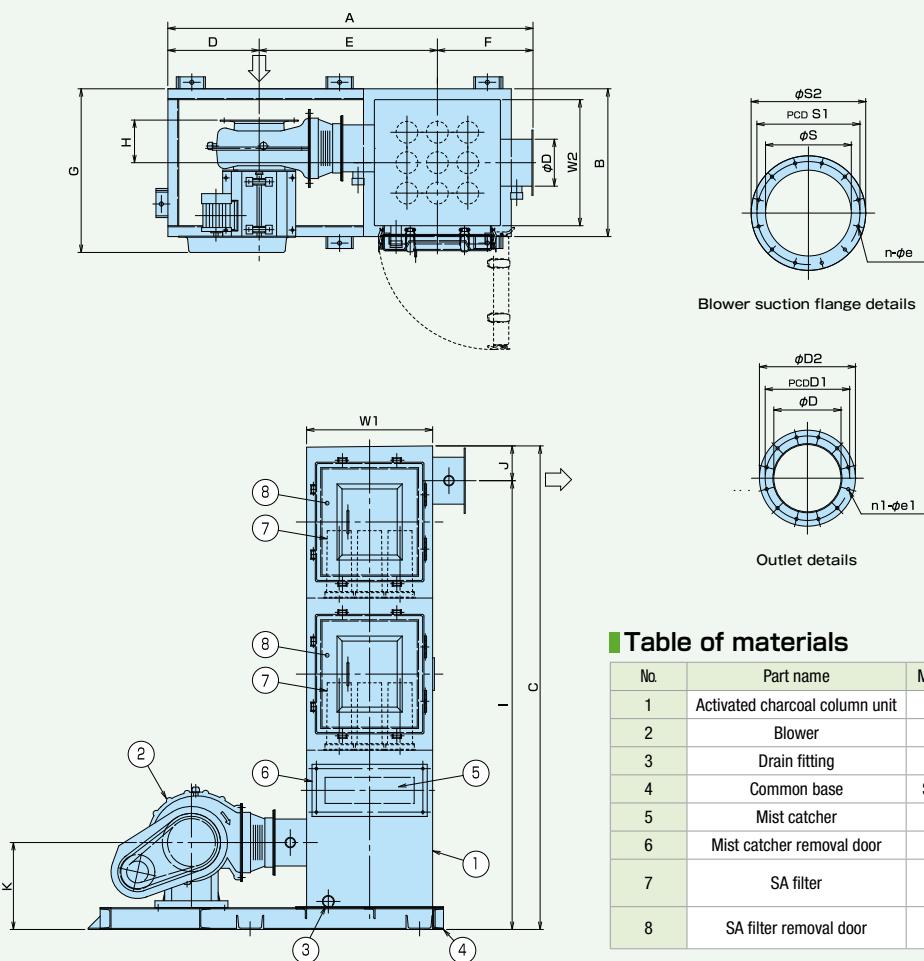


Table of materials

No.	Part name	Material	Quantity	Remarks
1	Activated charcoal column unit	FRP	1	
2	Blower	FRP	1	
3	Drain fitting	FRP	1	
4	Common base	SS400	1	Hot-dip galvanized
5	Mist catcher	PVC	1	MC-100
6	Mist catcher removal door	FRP	1	
7	SA filter	PP	2 sets	Including activated charcoal
8	SA filter removal door	FRP	2 sets	

SAF-A4D - A144D(sirocco fan series)standard specifications

Model	Number of SA filter units Number × stacks	Blower						Weight (kg)
		Model		Airflow rate (m³/min)		Static pressure (kPa)		
SAF-A4D	4 × 2	CES101		4		0.75	0.4	160
SAF-A9D	9 × 2	CES101		9		0.75	0.75	200
SAF-A16D	16 × 2	CES101		16		0.75	0.75	260
SAF-A25D	25 × 2	CES101		25		0.75	1.5	370
SAF-A36D	36 × 2	CES101		36		0.75	1.5	450
SAF-A50D	50 × 2	CES151		50		0.75	2.2	730
SAF-A72D	72 × 2	CES201		72		0.75	2.2	960
SAF-A96D	96 × 2	CES201		96		0.75	3.7	1150
SAF-A144D	144 × 2	NSF302		144		0.75	3.7	1770

Airflow rate and dimensions(unit: mm)of SAF-A4D - A144D(sirocco fan series)

Model	Airflow rate (m³/min)	A	B	C	D	E	F	G	H	I	J	K	W1	W2	φ S	PCDS1	φ S2	n-φe	φ D	PCDD1	φ D2	n1-φe1
SAF-A4D	~ 4	1650	590	2225	420	805	425	663	241	2065	160	400	550	440	268	322	358	12-10	210	264	300	12-10
SAF-A9D	5 ~ 9	1680	680	2225	420	820	440	753	196	2065	160	400	580	580	268	322	358	12-10	210	264	300	12-10
SAF-A16D	10 ~ 16	1820	820	2150	420	890	510	893	126	1990	160	400	720	720	268	322	358	12-10	210	264	300	12-10
SAF-A25D	17 ~ 25	2030	960	2390	420	1010	600	959	130	2205	185	400	900	860	268	322	358	12-10	260	322	360	12-10
SAF-A36D	26 ~ 36	2130	1100	2465	420	1060	650	1029	130	2250	215	400	1000	1000	268	322	358	12-10	310	382	420	16-12
SAF-A50D	37 ~ 50	3200	960	2610	500	1600	1100	1033	198	2360	250	420	1900	860	320	382	421	16-12	350	432	470	16-12
SAF-A72D	51 ~ 72	3460	1120	2700	500	1780	1180	1213	200	2445	255	525	2060	1000	422	482	520	20-14	400	482	520	20-15
SAF-A96D	73 ~ 96	3510	1400	2765	500	1830	1180	1353	200	2455	310	525	2060	1280	422	482	520	20-14	500	590	640	24-15
SAF-A144D	97 ~ 144	3990	2180	2950	900	1910	1180	1980	330	2615	335	795	2060	2060	510	590	640	24-14	550	630	670	28-12

Note: Each unit may be customized to increase the maximum airflow rate by 1.5 times from the standard flow rate, but then the pressure loss from the column will be 0.7 kPa (standard: 0.3 kPa).

Options

■ Addition of chemical liquid tank



■ Ventilator



■ Electrical control panel



■ Silencer box



■ pH meter



■ Drain pan



■ Damper



FDP type



Motor-operated damper

■ Silencer



Implementation examples with photos

■ Packed column implementation example



■ Electrical wiring implementation example



■ Large spray column implementation example



■ Horizontal chemical liquid scrubbing column implementation example



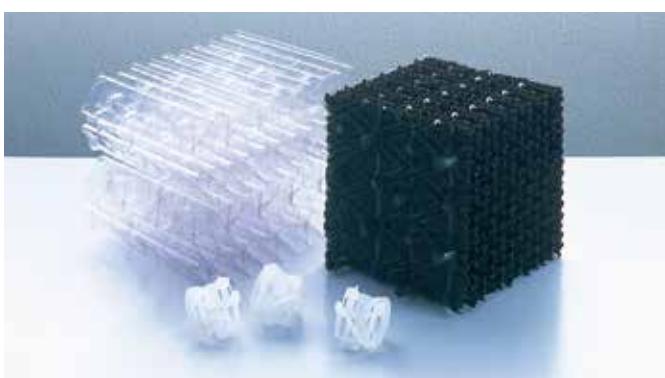
■ Biological odor removal column implementation example



■ Duct implementation example



Fillers and Nozzles

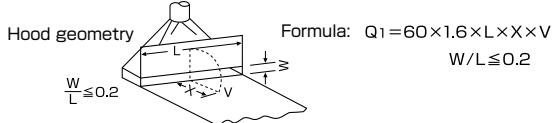


Technical information

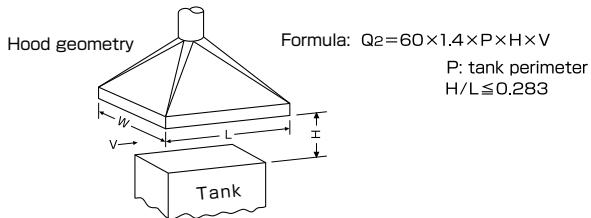
1. Determining the exhaust airflow rate

The exhaust airflow rate is calculated from the local ventilation system geometry as shown in the examples below:

- 1) Slot type one-way suction hood (exhaust airflow: $Q_1 \text{ m}^3/\text{min}$)



- 2) External top mounted hood (exhaust airflow: $Q_2 \text{ m}^3/\text{min}$)



2. Determining the exhaust duct design

The exhaust duct dimensions are determined in consideration of equipment costs, typically aiming to obtain a pressure loss of around 3 Pa/m.

3. Pressure loss calculation

The pressure loss from a duct is calculated using the following formula:

$$P = \zeta \times \gamma \times \frac{V^2}{2 \times g}$$

where,

P : pressure loss (1 mmAq = 9.8 Pa)

γ : specific weight of gas (1.2 kg/m³ for air)

ζ : coefficient of pressure loss from duct

V : wind velocity inside duct (m/s)

g : gravitational acceleration (9.8 m/s²)

The coefficient of resistance in the straight pipe portion of a duct with a rectangular cross-section is substituted by a value from an equivalent duct with round cross-section in the calculation of pressure loss:

$$D = 1.3 \times \left[\frac{(a \times b)^5}{(a+b)^2} \right]^{0.125}$$

where,

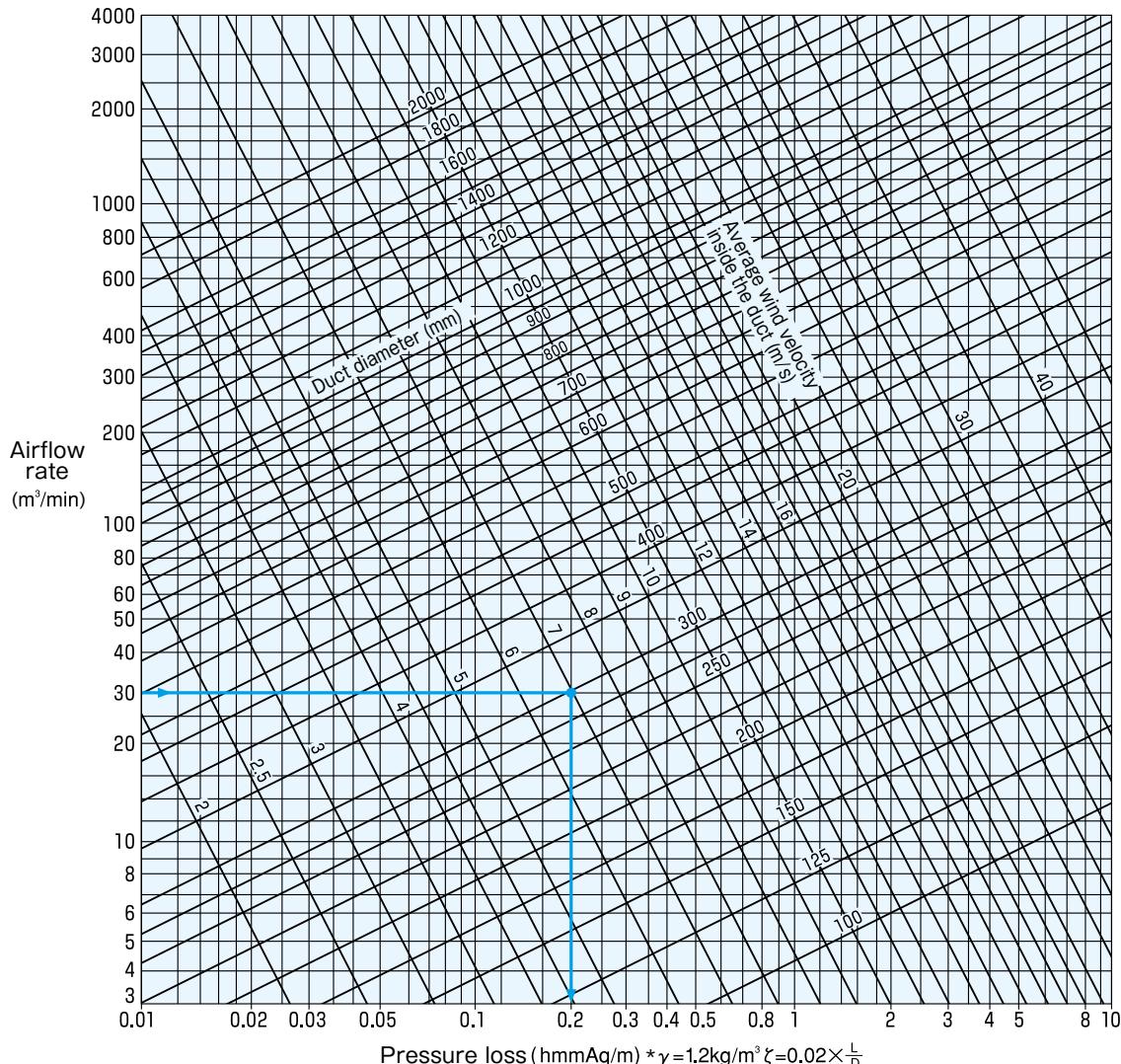
D : inside diameter of an equivalent duct with a round cross-section

a : width as measured on the rectangular duct cross-section

b : height as measured on the rectangular duct cross-section

Pressure loss quick reference chart for ducts with round cross-section

Example: If the duct diameter is 300 mm and the exhaust airflow is 30 m³/min., the wind velocity inside the duct is 7 m/sec. and the pressure loss per meter is 0.2 mmAq.



Calculating the coefficient of pressure loss from the geometrical particularities of the duct

Air pipe geometry	Illustration	Condition	Value of ζ	Air pipe geometry	Illustration	Condition	Value of ζ	
(1) Straight pipe			$0.02 \times \frac{L}{D}$	(11) Sudden shrinking at the inlet			0.50	
(2) Bent pipe with a round cross-section		$R/D = 0.5$ $= 0.75$ $= 1.0$ $= 1.5$ $= 2.0$	0.75 0.38 0.26 0.17 0.15	(12) Sudden expansion at the outlet (including a bell mouth)			1.0	
(3) Bent pipe with a rectangular cross-section		W/D 0.5 1~3	R/D 0.5 0.75 1.0 1.5 0.5 0.75 1.0 1.5	1.30 0.47 0.28 0.18 0.95 0.33 0.20 0.13	(13) Bell mouth at the inlet		0.03	
(4) Same as above but with a guide blade		W/D 1 2	R/D 0.5 0.75 1.0 1.5 0.5 0.75 1.0 1.5	0.70 0.16 0.13 0.12 0.45 0.12 0.10 0.15	(14) Orifice		$A_2/A_1 = 0$ $= 0.25$ $= 0.50$ $= 0.75$ $= 1.0$ $\zeta = \gamma \frac{\rho V_2^2}{2}$	2.8 2.4 1.9 1.5 1.0
(5) Folding of pipe with a round cross-section		Guide blade	0.87	(15) Sudden shrinking		$V_1/V_2 = 0$ $= 0.25$ $= 0.50$ $= 0.75$	0.5 0.45 0.32 0.18	
(6) Folding of pipe with a rectangular cross-section			1.25			$\zeta = \gamma \frac{\rho V_2^2}{2}$		
(7) 45-degree bent pipe		With a rectangular or round cross section With or without a guide blade	1/2 of the value for 90-degree bent pipe	(16) Sudden expansion		$V_2/V_1 = 0$ $= 0.20$ $= 0.40$ $= 0.60$ $= 0.80$	1.0 0.64 0.36 0.16 0.04	
(8) Pipe with widening		$\alpha = 5$ $= 10$ $= 20$ $= 30$ $= 40$	0.17 0.28 0.45 0.59 0.73			$\zeta = \gamma \frac{\rho(V_1^2 - V_2^2)}{2}$		
(9) Pipe with shrinking		$\alpha = 30$ $= 45$ $= 60$	0.02 0.04 0.07	(17) Double bent pipe		$L=0$ $L=D$ With a guide blade	0.43 0.31 0.15	
(10) Pipe with irregular geometry		$2A$ A $2A$	0.15			$R=1.5D$ $R=1.5D$ $R=1.5D$ $R_1=1.5D$	0.62 0.68 0.19	
						$L=0$ $L=D$ With a guide blade	0.42 0.46 0.21	
						$R_1=1.5D$ R_1 $R_2=0.5D$	Direction of the arrow Reverse direction	1.15 1.03

⚠ Cautions

1. This equipment handles dangerous chemicals and gases.
Please have the use of this equipment supervised by a person who has expert knowledge.
2. Major components of this equipment are made of fiber reinforced plastic(FRP) or polyvinyl chloride(PVC)resin. Protect them from external impact and ignition sources.
3. Any change to the initial operating conditions may trigger a hazard. Consult us before making any changes.
4. Note the following when installing this equipment:
 - (1) Do not install this equipment where it may be affected by flooding or near an ignition source.
 - (2) The exhaust from this equipment must be directed outside.
 - (3) The effluent from this equipment must be discharged after being properly treated.
 - (4) Consult us first before installing the equipment in a high place (16 m or more from the ground).
 - (5) If there is any risk of foreign substances(solids)being sucked into this equipment, take measures to prevent it.
 - (6) Provide a maintenance space(approx. 60 cm wide)next to the equipment.
5. Read the instruction manual without fail before assembling, installing or operating this equipment. If you do not have the instruction manual, request one from us.

Request to customers placing an inquiry or purchase order

● Please supply us with information about the following in as much detail as possible:

1. Type/Name of the target gas (and the name of any accompanying gas)
2. The airflow rate requirement and the concentration of the target gas
3. Target gas temperature (operating temperature and maximum temperature)
4. Purpose of using the scrubber and the source of the target gas (source equipment details, work conditions and ventilation method)
5. Scrubber performance requirements (removal efficiency and target gas concentration at outlet)
6. Scrubbing liquid type and conditions (liquid quality, concentration and temperature)
7. Control power source (voltage and frequency)
8. Scope of work, scope of estimation, delivery conditions, etc. (including information about spare items you need)
9. Scrubbing column installation position, place from which gas is delivered, duct route, etc. (Provide information as much detail as possible.)
(Provide us with drawings and other materials if you can.)

■ Qualification

Permitted construction related activities

License No. License from the Minister of Land, Infrastructure and Transport (Special-28) No. 2667
Type Mechanical equipment installation work, piping work and water service facility work

Licensing date June 25, 2016

- The details covered by this catalog are subject to change for the purpose of improvement.



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**JQA-2348
JQA-EM4095**

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and Vietnam are excluded from the scope
of the above certifications.)

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