Compact gas scrubber

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Compact gas scrubber

GEA's compact gas scrubbers are designed for gas treatment in laboratories, pilot and production plants in the chemical and pharmaceutical industries. Gas volume flows of up to 1,500 m^3/h can be treated without pressure loss.

Application

Compact gas scrubbers (KGW) from GEA are used for exhaust gas treatment and are applied in many industrial sectors. They are designed for the absorption of pollutants, the cooling of gases, the condensation of vapors and the separation of dust. In addition, chemical engineering processes such as the recovery of valuable substances or the synthesis of chemical products can be carried out with compact gas scrubbers.
KGW are typically made of polypropylene (PP), as PP is resistant to temperatures up to approx. 80°C and is also suitable for most caustic and acid solutions as well as for sour exhaust gases.
Other materials such as PE, GFK or metal materials can be used depending on the durability and process requirements. Designs in electrically conductive plastics for applications in hazardous areas (ATEX) are also possible.

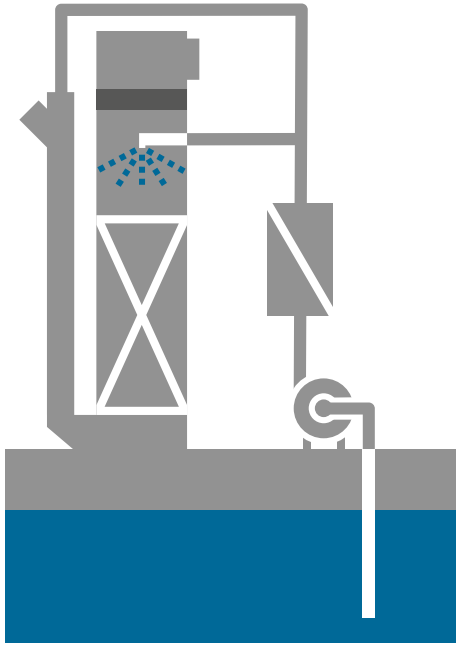
Function

GEA's compact gas scrubbers are unique among gas scrubbers. They operate according to the injection principle and are the only scrubbers that do not cause any pressure loss but generate a pressure increase in the gas flow instead. The circulating scrubbing liquid serves as a motive medium and conveys the induced gas through the jet scrubber pipe. Therefore, when using a compact gas scrubber from GEA no mechanical fan is required for extracting and conveying the gases.
After passing through the jet scrubber, the gas-liquid mixture is separated in a centrifugal separator. The separator is designed in a way that foam formation is avoided. The scrubbing liquid flows back into the liquid tank from where it is recirculated by a chemical-resistant pump.
The gas flows through a counter-current scrubbing column, which is operated with the scrubbing liquid from the circulating pump or, if required, with fresh scrubbing liquid.
Depending on process-specific requirements, a randomly packed column, a structured packing column or a tray column can be used. Droplets of entrained liquid are separated by a demister located at the top of the column in front of the gas outlet.
In special cases, the jet scrubber can also be designed as a quench to cool hot gases.

The solution or reaction heat released during the scrubbing process can either be dissipated by evaporation of water, continuous addition of fresh liquid with a corresponding liquid overflow or by installation of a heat exchanger.

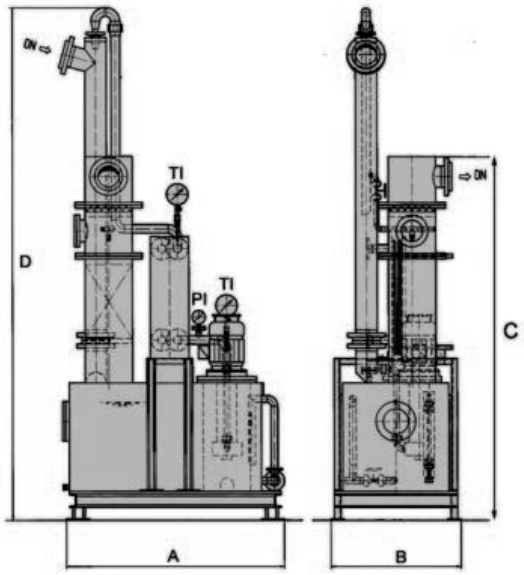
Key benefits

- broad range of applications, flexible in use
- selfextracting = no pressure loss
- wide load range, efficient partial load behavior
- easily combinable and expandable
- available in almost all materials
- resistant to fouling
- high reliability, low maintenance effort
- compact design, low space requirement
- CE conformity according to European Machine Directive (2006/42/EC)
- available in ATEX conform design, if required



Design

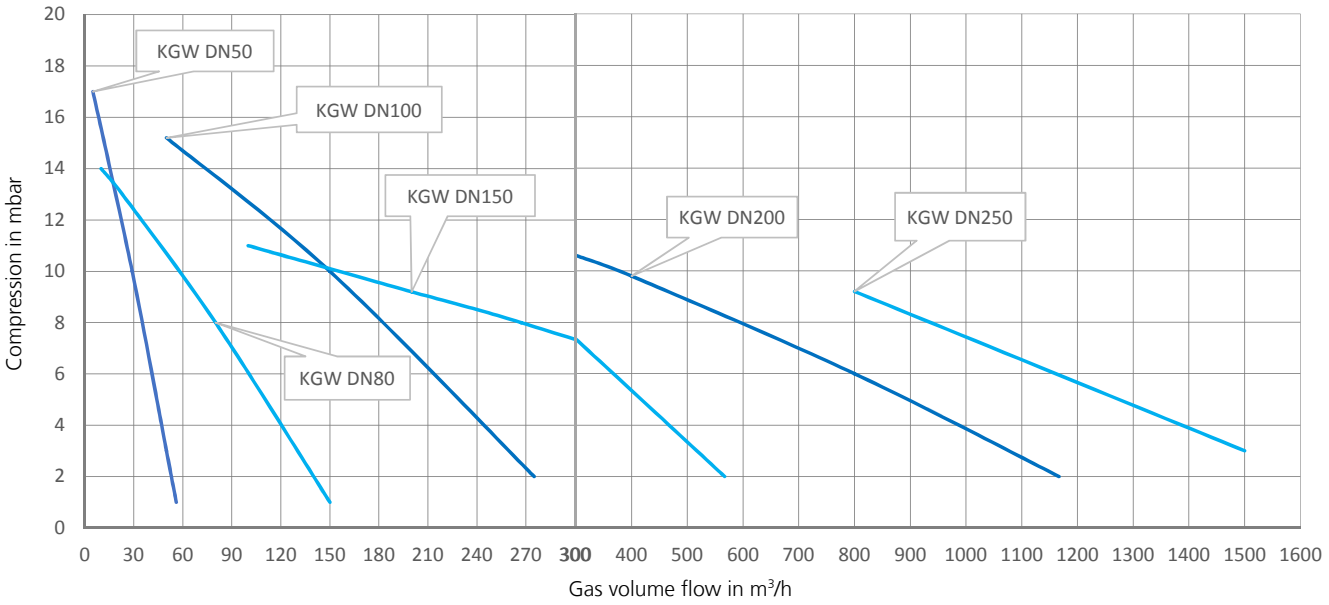
The compact gas scrubbers KGW from GEA are supplied in 6 standard sizes and 4 standard configurations. The modular concept allows easy expansion and adaptation to customer-specific requirements.



Standard equipment

Jet scrubber	PP
Centrifugal separator with pump supply tank and counter-flow scrubbing column	PP
Nozzles, demister and packing	PP (wetted parts)
Submerged pump	PP (wetted parts)
Circulation pump	PP (wetted parts)
Liquid piping and shut-off fittings	PP
Manometer	PP / PTFE / stainless steel
Trolley (optional)	Steel / stainless steel

Performance curves for standardized compact gas scrubbers



Technical parameters of standardized compact gas scrubbers KGW

Type	Suction flow in m³/h	Liquid content in tank in l	Gas inlet diameter DN	Main dimensions in mm			
				A	B	C	D
KGW DN50 / DN50 W	5 - 50	100	50	1200	700	1975	1975
KGW DN80 / DN80 W	5 - 150	190	80	1200	700	1990	1990
KGW DN100	50 - 230	400	100	1200	800	2660	2900
KGW DN100 W	50 - 230	700	100	1600	930	2750	3350
KGW DN150	100 - 500	400	150	1200	800	2660	3400
KGW DN150 W	100 - 500	700	150	1600	930	2750	3850
KGW DN200	300 - 1000	1000	200	1750	1000	3950	4700
KGW DN200 W	300 - 1000	1500	200	2200	1100	3950	4700
KGW DN250	800 - 1500	1250	250	2000	1000	4000	5000
KGW DN250 W	800 - 1500	1750	250	2500	1100	4000	5000

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Variations

Jet scrubber

- Horizontal and vertical gas inlet
- Rinsing ring on the vertical gas inlet flush and cool the inside of the scrubber pipe.
- Connection for a return line to control the suction pressure.

Liquid tank

- Rectangular and cylindrical design
- Drainage and flushing preparation

Counter-current column

- Randomly packed column
- Structured packing column
  The use of structured packing can be advantageous in order to reduce the overall height, the pressure drop or the amount of washing medium.
- Tray column

Circulation pumps

- Submerged pump
- External circulation pump

Measuring and control technology

If required, the compact gas scrubber can be equipped with any instrument needed for measuring the process parameters. It can also be equipped with a control system for operating, monitoring and controlling the system.

Aerosol separation

In special operating cases it is also required to separate aerosols. However, these aerosols can neither be effectively separated with a jet scrubber nor with a counter-current column. Therefore, if aerosols occur in the process, GEA can supply a suitable separator downstream of the counter-current column.

CE-Marking

A standardized compact gas scrubber is a machine within the meaning of the European Machinery Directive (2006/42/EC) and therefore CE certifiable. A corresponding declaration of conformity and the enclosed operating instructions in accordance with the Machinery Directive simplifies the integration into the production and, if necessary, the awarding of an overall CE certification.

For all inquiries please use our questionnaires.

Compact gas scrubber KGW DN150 W in standard design made of PP with plate heat exchanger and submerged pump

Compact gas scrubber KGW for exhaust gas containing EO/PO (ethylene oxide and propylene oxide) during tank and pipeline work Separation efficiency 99.999 %, clean gas value 0.5 mg/Nm³ EO/PO

Compact gas scrubber KGW DN80 W for 50 m³/h exhaust gas containing 1 kg/h Cl_2. Materials: steel/PTFE and stainless steel/ECTFE

Compact gas scrubber KGW DN80 with aerosol separator for 7 m³/h exhaust air containing chlorine compunds. Materials: PP EL, frame of stainless steel

Applications

- Separation of noxious substances (absorbtion)
- Solid separation (de-dusting)
- Gas saturation and cooling
- Hot gas quenching
- Condensation
- Gas conveyance

GEA Wiegand GmbH
Am Hardtwald 1
76275 Ettlingen, Germany
Tel +49 7243 705 0
Fax +49 7243 705 330
gea.com/contact
gea.com