



Gas cooler series EGK 2-19

In the chemical industry, petrochemistry or biochemistry, reliable process control relies on prompt and exact determination of the operating parameters.

Here, gas analysis is key for safe and efficient control of process flows, environmental protection and quality assurance. This benefits controlling flue gas emission in power stations or exhaust gas analysis in automotive engineering, as well as the efficient control of air separators or sterile production and packaging in the food industry.

Many of the analysis processes used in these fields require extracting the sample gas. This inevitably also extracts process-related contamination such as particles or moisture. These in turn can impact the measurement results or damage the measuring cells. The sample gas must therefore be conditioned before entering the analyser.

The compact system EGK 2-19 is a 19" rack with sample gas cooler and condensate drain, particle filter and moisture detector for up to two gas paths.

Compact design: fully assembled and ready to connect

Low maintenance costs based on easy accessibility

One or two gas paths

Heat exchanger made from stainless steel, Duran glass or PVDF

Adjustable outlet dew point and alarm thresholds

Self-monitoring

Status outputs

Ambient temperatures up to 50 °C

Rated cooling power 320 kJ/h

Dew point stability 0.1 K

Available as 19" rack or for wall-mounting



Description

Concept

The EGK 2-19 concept is firstly based on a cooler for one or two heat exchangers.

In addition, other components which every conditioning system should feature can optionally be integrated:

- Peristaltic pump for condensate separation
- Filter
- Moisture detector

This therefore allows for virtually any configuration of cooler and options. Here the approach is to simplify creating a complete system in a cost-efficient way through pre-installed components with hoses connected.

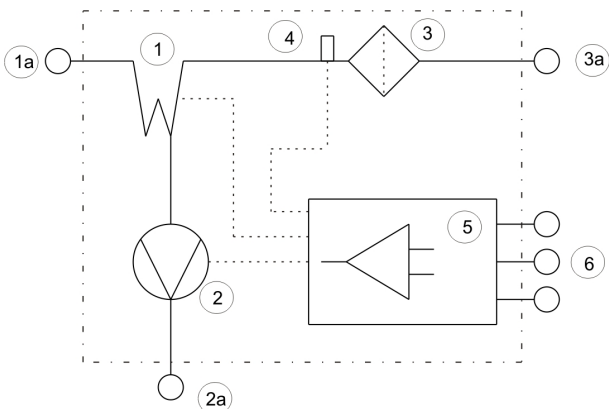
We further paid attention to easy access to consumables, consequently located at the front.

The glass dome allows the dirt level of the filter element to easily be determined.

The moisture detector is easy to remove. This may be required if water enters the cooler due to a malfunction and the peristaltic pump can no longer remove it.



Description of a fully equipped gas path



The gas to be conditioned is fed directly into the inlet of the stainless steel, glass or PVDF heat exchanger (1, 1a). A hose is pre-installed between the heat exchanger outlet and the fine filter (3). Sample gas is continued directly from the outlet of this filter via hose fitting (3a).

Condensate is removed by the peristaltic pump (2), the inlet of which is directly connected to the heat exchanger via hose.

A moisture detector (4) may be installed directly into the filter, which is analysed by electronics (5). This eliminates the need to purchase additional controllers.

Control (5)

The control features a microprocessor-controlled Bühler Constant Regulation at its core.

The display with control keys at the front displays the cooler temperature as well as all operating statuses.

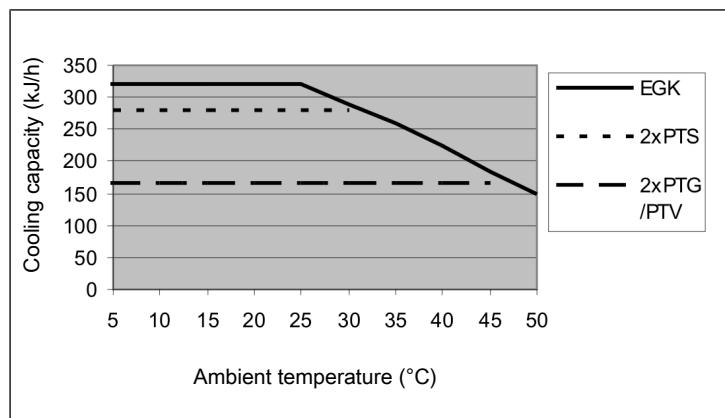
Use the keys to set various parameters such as output dew point, alarm limits or the sensitivity of moisture detectors.



Electrical connections (6)

All signals output by the electronics can be accessed via Phoenix plug at the top of the cooler. The electric supply is also a plug connection. This means no fixed wiring is required.

Performance data



Gas cooler technical data

Gas cooler technical data

Ready for operation	after max. 15 minutes
Rated cooling capacity (at 25 °C)	320 kJ/h
Ambient temperature	5 °C to 50 °C
Gas output temperature, preset:	approx. 5 °C
Dew point fluctuations static:	0.1 K
in the entire specification range:	± 1.5 K
Temperature difference between heat exchangers	< 0.5 K
Max. Inlet temperature	see table "Heat Exchanger Overview"
Max. Pressure	see table "Heat Exchanger Overview" Limitations due to filter or peristaltic pump (see Technical Data - Options)
Protection class	IP 20
Housing	Stainless steel
Packaging dimensions	approx. 550 x 430 x 340 mm
Weight incl. heat exchanger	approx. 15 kg approx. 19 kg at full expansion stage
Electric supply	115 V or 230 V, 50/60 Hz Plug per DIN 43650
Power input	290 VA (115 V) / 260 VA (230 V)
Alarm output switching connection	max. 250 V, 2 A Phoenix plug
Gas connections	Heat exchanger see table "Heat Exchanger Overview" Filter DN 4/6 / 1/4"-1/6"
Condensate outlet	Hose nipple Ø5 mm
Parts in contact with mediums	
Filter:	see "Technical Data - Options"
Moisture detector:	see "Technical Data - Options"
Heat exchanger:	see table "Heat Exchanger Overview"
Peristaltic pump:	see "Technical Data - Options"
Tubing:	PTFE/Viton

Technical Data - Options

Technical data analogue output cooler temperature

Signal	4-20 mA, 2-10 V or corresponds to -20 °C to +50 °C cooler temperature Plug M12x1
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Technical Data Moisture Detector FF-3-N

max. operating pressure with FF-3-N	2 bar
Material	PVDF, PTFE, epoxy resin, stainless steel 1.4571, 1.4576

Technical Data Peristaltic Pumps CPsingle

Flow rate	0.3 L/h (50 Hz) / 0.36 L/h (60 Hz) with standard hose
Vacuum inlet	max. 0.8 bar
Pressure inlet	max. 1 bar
Pressure output	1 bar
Hose	4 x 1.6 mm
Protection class	IP 40
Materials	
Hose:	Norprene (Standard), Marprene, Fluran
Connections:	PVDF

Technical Data Filter AGF-FA-5

max. operating pressure with filter	2 bar
Filter surface	42 cm ²
Filter fineness	2 µm
Dead volume	28.5 ml
Materials	
Filter:	PTFE, PVDF, Duran glass (parts in contact with mediums)
Seal:	Viton
Filter element:	sintered PTFE

Heat exchanger description

The energy content of the sample gas and the required cooling capacity of the gas cooler is determined by three parameters: gas temperature ϑ_G , dew point T_e (moisture content) and volume flow v . The outlet dew point rises with increasing energy content of the gas. The following limits for the maximum flow are specified for a standard operating point of $T_e=40\text{ °C}$ and $\vartheta_G=70\text{ °C}$. Indicated is the maximum flow v_{\max} in NI/h of cooled air, so after moisture has condensed. Values may differ for other dew points and gas inlet temperatures. However, the physical facts are so vast we decided to omit the illustration. Please contact our experts for clarification or refer to our design program.

Heat exchanger overview

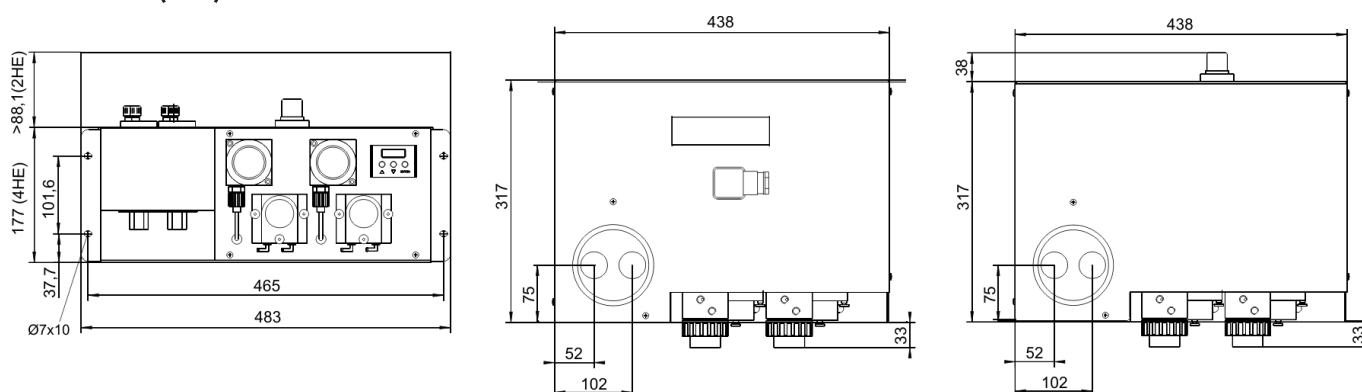
Heat exchanger	PTS PTS-I ²⁾	PTG PTG	PTV PTV-I ²⁾
Version / Material	Stainless steel	Glass	PVDF
Flow rate v_{\max} ¹⁾	500 NI/h	280 NI/h	280 NI/h
Inlet dew point $T_{e,\max}$ ¹⁾	65 °C	65 °C	65 °C
Gas inlet temperature $\vartheta_{G,\max}$ ¹⁾	180 °C	140 °C	140 °C
Max. Cooling capacity Q_{\max}	150 kJ/h	90 kJ/h	90 kJ/h
Gas pressure p_{\max}	160 bar	3 bar	2 bar
Pressure drop Δp ($v=150$ L/h)	10 mbar	10 mbar	10 mbar
Dead volume V_{tot}	29 ml	29 ml	57 ml
Gas connections (metric)	Swagelock 6 mm	GL 14 (6 mm) ³⁾	DN 4/6
Gas connections (US)	1/4"	GL 14 (1/4") ³⁾	1/4"-1/6"
Condensate out connections (metric)	G3/8	GL 25 (12 mm) ³⁾	G3/8
Condensate out connections (US)	NPT 3/8"	GL 25 (1/2") ³⁾	NPT 3/8"

¹⁾ Max. cooling capacity of the cooler must be considered

²⁾ Models marked I have NPT threads or US tubes, respectively.

³⁾ Gasket inside diameter

Dimensions (mm)



Ordering instructions

Gas cooler models with one heat exchanger

The item number is a code for the configuration of your unit. Please use the following model key:

452	X	X	X	X	X	X	X	X	X	0	Product characteristic
Gas cooler models (with 1 heat exchanger)											
0											Wall mounting
1											19" rack installation
Supply voltage											
1											115 V metric screw connections
2											230 V metric screw connections
3											115 V US screw connections
4											230 V US screw connections
Heat exchanger											
0	0										without heat exchanger
1	1										Single WT stainless steel/ (PTS and TS-I)
1	2										Single WT glass / (PTG)
1	3										Single WT PVDF / (PTV and PTV-I)
Condensate drain											
0											without condensate drain
1											1 peristaltic pump CPsingle with hose connection 90° angle ¹⁾
3											1 peristaltic pump CPsingle with straight hose connection ¹⁾
Filter											
0											without filter
1											1 filter installed
Moisture detector ²⁾											
0											without moisture detector
1											1 moisture detector installed
Option ²⁾											
0											not an option
1											with 4 - 20 mA analogue output for temperature

¹⁾ Every heat exchanger is equipped with one peristaltic pump. The supply voltage corresponds with that of the main unit.

²⁾ The "moisture detector" option includes the option "4 – 20 mA analogue output".

Gas cooler models with two heat exchangers

The item number is a code for the configuration of your unit. Please use the following model key:

452	X	X	X	X	X	X	X	X	X	0	Product characteristic
											Gas cooler models (with 2 heat exchangers)
	0										Wall mounting
	1										19" rack installation
											Supply voltage
		1									115 V metric screw connections
		2									230 V metric screw connections
		3									115 V US screw connections
		4									230 V US screw connections
											Heat exchanger
		0	0								without heat exchanger
		2	1								2 Single WT stainless steel / (PTS and PTS-I)
		2	2								2 Single WT glass / (PTG)
		2	3								2 Single WT PVDF / (PTV and PTV-I)
											Condensate drain
		0									without condensate drain
		2									2 peristaltic pumps CPsingle with screw connection 90° angle ¹⁾
		4									2 peristaltic pumps CPsingle with straight hose connection ¹⁾
											Filter
		0									without filter
		1									1 filter installed
		2									2 filters installed
											Moisture detector ²⁾
		0									without moisture detector
		1									1 moisture detector installed (only possible with 1 filter)
		2									2 moisture detectors installed (only possible with 2 filter)
											Option ²⁾
		0									not an option
		1									with 4 - 20 mA analogue output for temperature

¹⁾ Every heat exchanger is equipped with one peristaltic pump. The supply voltage corresponds with that of the main unit.

²⁾ The "moisture detector" option includes the option "4 – 20 mA analogue output".

Spare parts and accessories

Item no.	Description
41 15 10 50	Filter element FE-4; Unit 8 count
4492 0035 012	Norprene replacement hose with angled connections for peristaltic pump 0.3 L/h
4492 0035 013	Norprene replacement hose with one straight and one angled connection for peristaltic pump 0.3 L/h
41 01 00 3	O-ring for filter AGF-FA-5, Unit 8 count, sintered PTFE