

Sample Gas Cooler EGK 2-19



Accurate measurements of gases require gas samples with stable dew points even under harsh ambient conditions.

The EGK models provide a compressor-type cooling system connected to a cooling block. The cooling block evenly dissipates the heat thus supporting the highly efficient heat exchangers. The temperature of the cooling block is regulated by the **Bühler Constant Regulating System**. This system allows smooth regulation and eliminates the disadvantages of the traditional on-off operating mode.

The EGK 2-19 can be supplied with one or two heat exchangers made of stainless steel, glass or PVDF. Condensate is drained by peristaltic pumps.

Filters can be installed and the filter housings may include moisture detectors.

Measurement and display of signals are by the internal microcontroller and the LED display.

Due to the wide variety of combinations and pre assembled parts, a cooling system can be designed for any specific application. Contact one of Bühler's application specialists for further information.

- **Compact design: completely pre assembled and ready for connecting**
- **Low maintenance cost due to easy accessibility**
- **One or two gas paths**
- **Heat exchanger made of stainless steel, DURAN glass or PVDF**
- **Adjustable outlet dew point and alarm limits**
- **Self-monitoring**
- **Status outputs**
- **Ambient temperatures up to 122°F**
- **Nominal cooling capacity 304 Btu/hr**
- **Dew point stability 0.1 K**

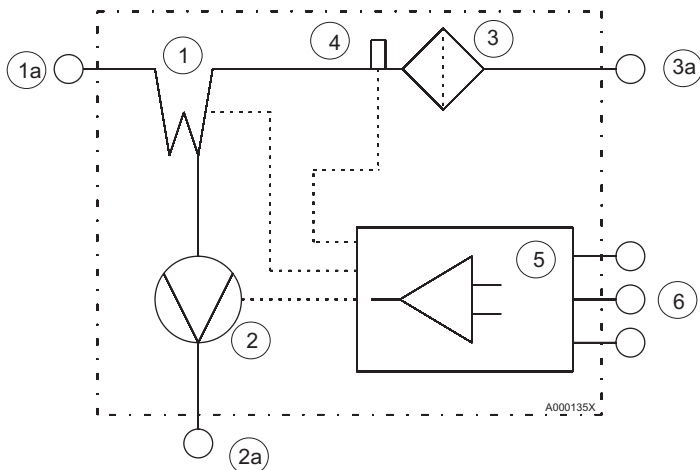
Concept

The EGK 2-19 may include one or two heat exchangers designed for installation in a 19" cabinet. Optional components commonly found in conditioning system can be integrated:

- peristaltic pumps for condensate drainage
- filters
- moisture detectors

The cooler is completely configurable to meet the needs of any specific application. This modular approach combines many of the discrete functions of previous designs therefore minimizing cost and assembly time.

The condition of the filter element can be seen easily through a viewing glass. The moisture detector is easy to disassemble for maintenance.



Description of a fully assembled gas path

The sample gas is routed to the input of the heat exchanger (1,1a) made of stainless steel, glass or PVDF. The output of the heat exchanger is pre-tubed to the filter (3). The dried and filtered sample gas leaves the filter at the outlet (3a). The condensate is withdrawn by the peristaltic pump (2) which is tubed to the heat exchanger. The optional moisture detector is monitored by the internal controller. This eliminates the need for additional controllers.

Controller (5)

The core element of the electronic circuit is the microprocessor-controlled Buhler Constant Regulating System. The front panel display (with 3 control keys) shows the cooler temperature as well as the system status. Several system parameters can be set such as outlet dewpoint, alarm limits or sensitivity of the moisture detector.

Electrical connections (6)

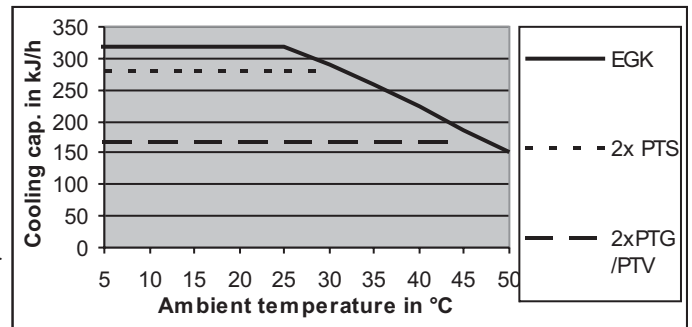
All signals are accessible at the back of the cooler via a Phoenix plug. The power supply is connected via a plug as well. No fixed wiring is required.



Technical data

Warming up time	after max. 15 min.
Nominal cooling capacity (at 25°C)	320 kJ/h
Ambient temperature	+5...50 °C
Factory set dew point	ca. 5 °C
Dew point stability static	0.1 K
Drift over full range	± 1.5 K
Temperature differential between heat exchangers	< 0.5 K
Max. input gas parameters	see table heat exchanger
Max. Pressure	see table heat exchanger possible limitations by filter or peristaltic pump (see there)

Performance data



Remark: Limits shown for the heat exchangers are for an inlet dew point of 40°C.

Heat exchanger

The energy content of the sample gas and, as a result, the cooling capacity is determined by 3 parameters: gas temp. ϑ_G , dewpoint τ_e and flow v . The outlet dewpoint rises with increasing energy content (heat) of the gas. The required cooling capacity is determined by the max. acceptable level of the outlet dew point.

The following table shows cooler performance assuming the following conditions: $\tau_e=40^\circ\text{C}$ and $\vartheta_G=70^\circ\text{C}$. Indicated is the v_{\max} in NI/h cooled air (i.e. after the moisture has condensed).

If the real values stay below the parameters τ_e and ϑ_G , Q_{\max} can be increased. For example, instead of $\tau_e = 40^\circ\text{C}$, $\vartheta_G = 70^\circ\text{C}$ and $v = 280$ l/h the values $\tau_e=50^\circ\text{C}$, $\vartheta_G=80^\circ\text{C}$ and $v=220$ l/h could be achieved.

Please let us know if you want assistance or use our cooler adaption programme.

Heat exchanger	PTS	PTG	PTV
Flow rate $Q_{\max}^{1)}$	500 l/h	280 l/h	280 l/h
Inlet dewpoint $\tau_{e,\max}^{1)}$	65 °C	65 °C	65 °C
Gas inlet temperature. $\vartheta_{G,\max}^{1)}$	180 °C	140 °C	140 °C
Gas pressure p_{\max}	160 bar	3 bar	3 bar
Pressure drop Δp ($Q=150$ l/h)	10 mbar	10 mbar	10 mbar
Dead volume V_{tot}	29 ml	29 ml	57 ml
Sample gas connections	Swagelok 6 mm	GL 14	DN 4/6
Condensate out connections	G 3/8" i	GL 25	G 3/8" i

¹⁾ with maximum heat transfer of the heatexchanger and max. cooling capacity of the cooler

Electrical specification

Power supply	115 or 230 V, 50/60 Hz, plug according to DIN 43650
Power consumption	290/260 VA
Status contacts	specs. Max. 250 V, 2A
Plug type	Phoenix-plug according
Protection class	IP 20

General data

Housing	Stainless steel	Gas terminals:	Exchangers see table
Packing dimensions	appr. 390 x 300 x 400 mm		Filter DN 4/6
Weight incl. heat exchangers	appr. 15 kg		Peristaltic pump: 5mm
Weight fully equipped	19 kg	Media wetted materials:	Filter: see table
			Exchanger see table
			Tubing

Peristaltic pump (optional)

Maximum pressure of the system limited by the pump ≤ 0.5 bar

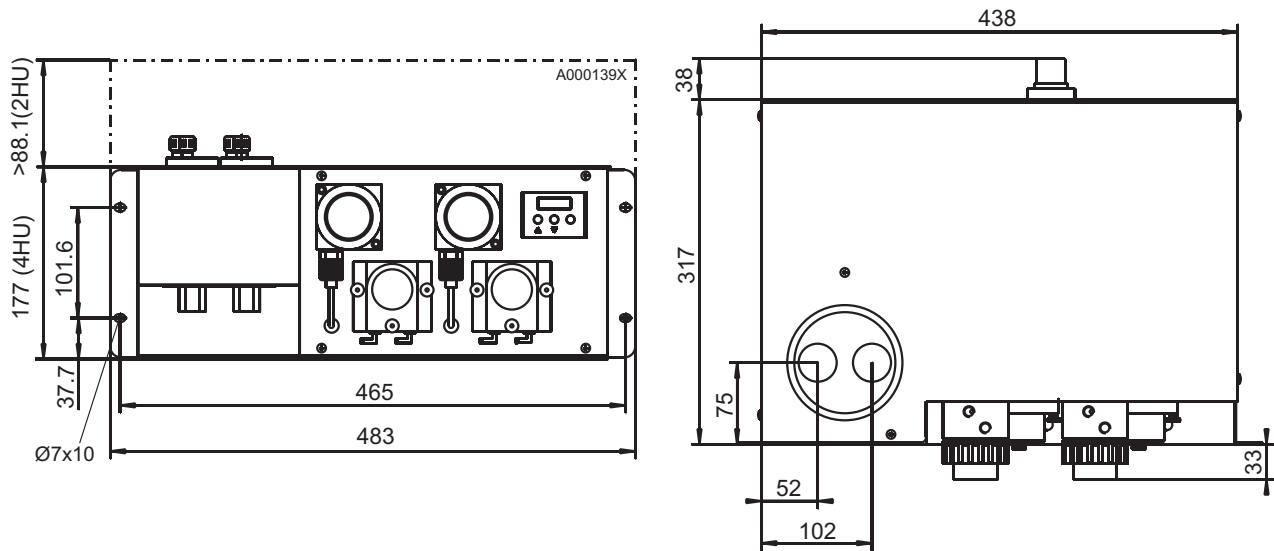
Hose	Norprene	Vacuum	> 320 mbar
Pump flow	0.3 l/h	Pressure	> 0.5 bar

Filter (optional)

Filter surface	42 cm ²	Material filter housing	PTFE, PVDF, Duran glass (wetted parts)
Retention rate	2µm	Material Sealing	Viton
Dead volume	28.5 ml	Material filter element	Sintered PTFE

Dimensions

Please note: Space above the cooler for the tubing must be provided.



Ordering hints

Replace the X at the column by the code of your selection below

45 21	x	x	x	x	x	x	x	EGK 2-19	AX000001
								Power supply	
1								115V	
2								230V	
	0	0	0	0	0	0		No heat exchanger, no options	
1	x	x	x	x				One heat exchanger	
	1							SS	
	2							Glass	
	3							PVDF	
		0						Without peristaltic pump	
		1						With one peristaltic pump	
			0					Without filter	
			1					With filter	
				0				Without moisture detector	
				1				With moisture detector	
					0			Without options	
					1			With analogue output for temperature signal (always included in option moisture detector)	
2	x	x	x	x				Two heat exchangers	
	1							SS	
	2							Glass	
	3							PVDF	
		0						Without peristaltic pump	
		2						With two peristaltic pumps	
			0					Without filter	
			1					With one filter	
			2					With two filters	
				0				Without moisture detector	
				1				With moisture detectors	
					0			Without options	
					1			With analogue output for temperature signal (always included in option moisture detector)	

Ordering hints spare parts

Part No.	Description
91 24 03 00 27	Spare tube for peristaltic pump, right angle terminals
41 15 10 50	Filter element FE-4, Package 8 pcs.