



## Sample gas cooler EGK 1 Ex2

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

Here, gas analysis is the 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 EGK 1 Ex2 compressor sample gas cooler is ATEX, IECEx and EAC Ex approved and is suitable for operation in explosive zones with up to 2 gas paths.

Ex-approved Zone 2

EAC Ex approval

Compact design

One/two gas path(s)

Heat exchanger in stainless steel, DURAN® glass and PVDF

Bühler constant control system

Self-monitoring

Block temperature display

Status alarm

Rated cooling power 320 kJ/h

Dew point stability 0.1 °C


CFC-free



**Please note for this device:**

The equipment must be installed in a lockable housing or cabinet that has a degree of protection of at least IP54 and meets the requirements of EN/IEC 60079-0 or alternatively EN/IEC 60079-7 in type of protection 'Ex e' for category 3/EPL Gc (zone 2).

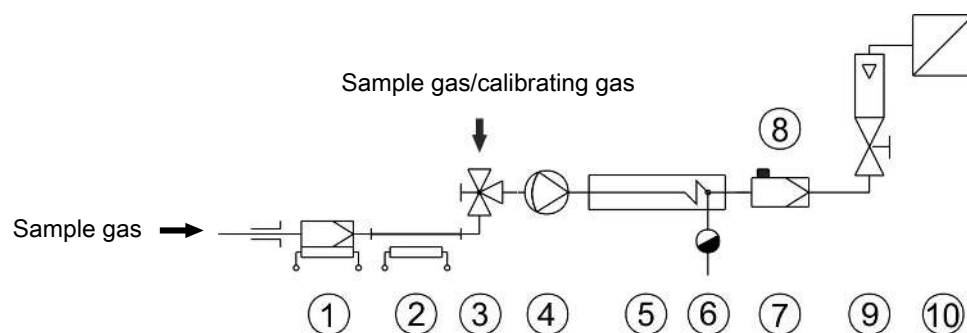
**Gas cooler technical data****Gas Cooler Technical Data**

Ready for operation:	after max. 15 minutes	
Rated cooling capacity (at 25 °C):	320 kJ/h	
Ambient temperature:	5 °C to 50 °C	
Gas outlet dew point		
preset:	approx. 5 °C	
adjustable:	3 °C to 20 °C	
Dew point fluctuations		
static:	± 0.1 K	
in the entire specification range:	± 1.5 K	
IP rating:	IP 20	
Housing:	Stainless steel	
Packaging dimensions:	approx. 390 x 300 x 400 mm	
Weight incl. heat exchanger:	approx. 15 kg	
Refrigerant (global warming potential):	R134a (GWP 1430)	
Quantity:	75 g	
CO <sub>2</sub> -equivalent:	0.107 T	
Electric supply:	115 V, 60 Hz or 230 V, 50 Hz Plug per DIN EN 175301-803 EAC Ex version incl. mains and connection cable	
Electrical data:	230 V	115 V
	Typical power input:	140 VA
	max. operating current:	1.6 A
	temporary starting currents are significantly higher.	
Status output switching capacity:	max. 250 V, 2 A, 50 VA Terminal plug per DIN EN 175301-803	
Installation:	stand-alone or wall-mounted, dry and dust-free	
Markings:	ATEX:  II 3G Ex ec nA nC IIC T4 Gc IECEx: Ex ec nA nC IIC T4 Gc EAC Ex: 2Ex e nA nC IIC T4	
Applied standards:	IEC 60079-0 (Ed. 6.0); IEC 60079-7 (Ed. 5.0); IEC 60079-15 (Ed. 4.0) EN 60079-0:2012+A11:2013; EN 60079-7:2015; EN 60079-15:2010	
IECEx certificate number:	IECEx IBE 17.0023X	
EAC Ex certificate number:	TC RU C-DE.MIO62.B.05995	

**Technical Data - Options****CPsingle Peristaltic Pumps Technical Data**

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
Outlet pressure	1 bar
Hose	4 x 1.6 mm
Protection class	IP 40
Materials	
Hose:	Norprene (standard), Marprene, Fluran
Connections:	PVDF

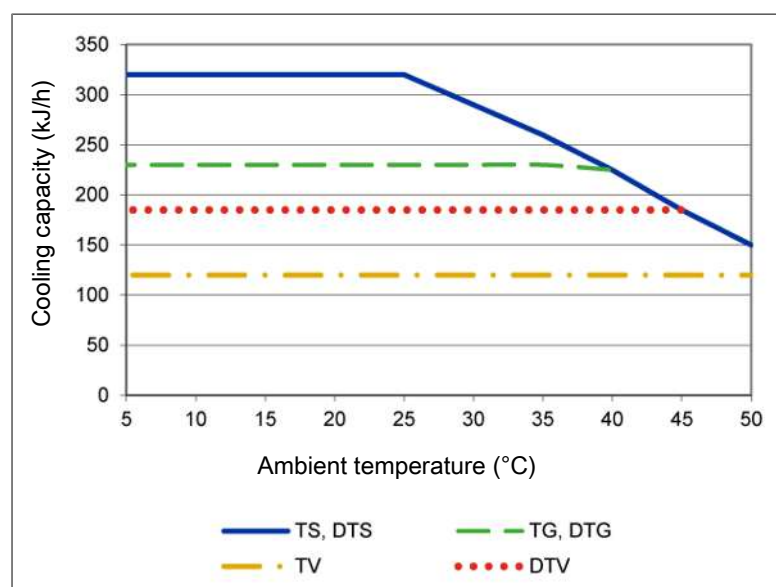
## Diagram typical installation



1 Sample gas probe	2 Sample gas line
3 Reversing tap	4 Sample gas pump
5 Sample gas cooler	6 Automatic condensate drain or peristaltic pump
7 Fine mesh filter	8 Moisture detector
9 Flow meter	10 Analyser

See data sheets for individual component models and data.

## Performance data



Remark: The limit curves for the heat exchangers exchanger apply to a dew point of 65 °C.

## 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  $\vartheta_G$ , (inlet) dew point  $\tau_e$  (moisture content) and volume flow  $v$ . The outlet dew point rises with increasing energy content of the gas. The approved energy load from the gas is therefore determined by the tolerated rise in the dew point.

The following limits are specified for a normal standard operating point of  $\tau_e = 65^\circ\text{C}$  and  $\vartheta_G = 90^\circ\text{C}$ . The maximum volume flow  $v_{\max}$  in  $\text{NI/h}$  of cooled air is indicated, so after moisture has condensed.

If the values fall below  $\tau_e$  and  $\vartheta_G$ , the flow  $v_{\max}$  may be increased. For example, on the TG heat exchanger the parameter triple  $\tau_e = 65^\circ\text{C}$ ,  $\vartheta_G = 90^\circ\text{C}$  and  $v = 280 \text{ NI/h}$  may also be used in place of  $\tau_e = 50^\circ\text{C}$ ,  $\vartheta_G = 80^\circ\text{C}$  and  $v = 380 \text{ NI/h}$

Please contact our experts for clarification or refer to our design program.

## Heat exchanger overview

Heat exchanger	TS TS-I <sup>2)</sup>	TG TG	TV TV-I <sup>2)</sup>	DTS (DTS-6 <sup>3)</sup> ) DTS-I (DTS-6-I <sup>3)</sup> ) <sup>2)</sup>	DTG DTG	DTV <sup>3)</sup> DTV-I <sup>2)</sup> <sup>3)</sup>
Materials in contact with media	Stainless steel	DURAN® glass PTFE	PVDF	Stainless steel	DURAN® glass PTFE	PVDF
Flow rate $v_{\max}$ <sup>1)</sup>	530 L/h	280 L/h	155 L/h	2 x 250 L/h	2 x 140 L/h	2 x 115 L/h
Inlet dew point $\tau_{e,\max}$ <sup>1)</sup>	80 °C	80 °C	65 °C	80 °C	65 °C	65 °C
Gas inlet temperature $\vartheta_{G,\max}$	130 °C (180 °C) <sup>5)</sup>	130 °C	130 °C	130 °C (180 °C) <sup>5)</sup>	130 °C	130 °C
Max. cooling capacity $Q_{\max}$	450 kJ/h	230 kJ/h	120 kJ/h	450 kJ/h	230 kJ/h	185 kJ/h
Gas pressure $p_{\max}$	160 bar	3 bar	3 bar	25 bar	3 bar	2 bar
Pressure drop $\Delta p$ ( $v=150$ L/h)	8 mbar	8 mbar	8 mbar	5 mbar each	5 mbar each	15 mbar each
Dead volume $V_{\text{dead}}$	69 ml	48 ml	129 ml	28/25 ml	28/25 ml	21/21 ml
Gas connections (metric)	G1/4	GL 14 (6 mm) <sup>4)</sup>	DN 4/6	6 mm tube	GL14 (6 mm) <sup>4)</sup>	DN 4/6
Gas connections (US)	NPT 1/4"	GL 14 (1/4") <sup>4)</sup>	1/4"-1/6"	1/4" tube	GL14 (1/4") <sup>4)</sup>	1/4"-1/6"
Condensate out connections (metric)	G3/8	GL 25 (12 mm) <sup>4)</sup>	G3/8	Tube 10 mm (6 mm)	GL18 (10 mm) <sup>4)</sup>	DN 5/8
Condensate out connections (US)	NPT 3/8"	GL 25 (1/2") <sup>4)</sup>	NPT 3/8"	Tube 3/8" (1/4")	GL18 (3/8") <sup>4)</sup>	3/16"-5/16"

<sup>1)</sup> Considering the maximum cooling capacity of the cooler.

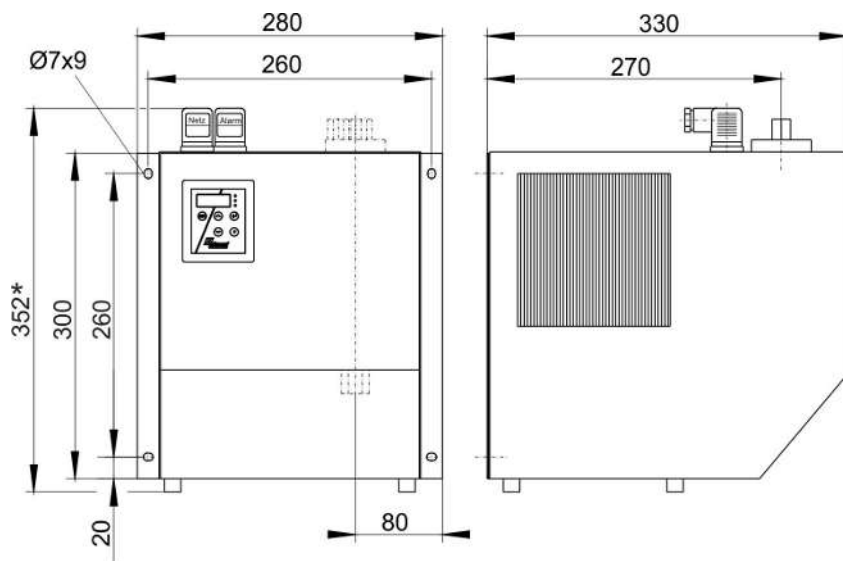
<sup>2)</sup> Models marked I have NPT threads or US tubes, respectively.

<sup>3)</sup> Condensate drain only possible with condensate pump.

<sup>4)</sup> Gasket inside diameter.

<sup>5)</sup> With temperature class T3 gases the permissible gas inlet temperature is max. 180 °C.

## Dimensions (mm)



\* on EAC Ex unit 359 mm through connection cable.

## Ordering instructions

### Gas cooler

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

**Please note:** Every individual gas path must be equipped with peristaltic pump or condensate drain.

4563	211	X	X	X	X	X	X	0	0	0	Product Characteristics
											<b>Certifications</b>
											2 ATEX Zone 2
											5 EAC Ex
											<b>Voltage</b>
											1 115 V, 60 Hz
											2 230 V, 50 Hz
											<b>Heat exchanger</b>
											1 1 0 1 gas path, stainless steel/ (TS), metric
											1 1 5 1 gas path, stainless steel/ (TS-I), US
											1 2 0 1 gas path, glass/ (TG), metric
											1 2 5 1 gas path, glass/ (TG), US hoses
											1 3 0 1 gas path, PVDF/ (TV), metric
											1 3 5 1 gas path, PVDF/ (TV-I), US
											2 6 0 2 gas paths, stainless steel/ (DTS), metric
											2 6 1 2 gas paths, stainless steel/ (DTS-6) <sup>1)</sup> , metric
											2 6 5 2 gas paths, stainless steel/ (DTS-I), US
											2 6 6 2 gas paths, stainless steel/ (DTS-6-I) <sup>1)</sup> , US
											2 7 0 2 gas paths, glass/ (DTG), metric
											2 7 5 2 gas paths, glass/ (DTG-I), US hoses
											2 8 0 2 gas paths, PVDF/ (DTV) <sup>1)</sup> , metric
											2 8 5 2 gas paths, PVDF/ (DTV-I) <sup>1)</sup> , US
											<b>Condensate drain</b> <sup>2)</sup>
											0 without condensate drain
											1 Peristaltic pump CPsingle with hose connection 90° angle <sup>2)</sup>
											2 2 peristaltic pumps CPsingle with 90° elbow hose connection <sup>2)</sup>
											3 CPsingle peristaltic pump with screw-in hose connection <sup>2)</sup>
											4 2 peristaltic pumps CPsingle with screw-in hose connection <sup>2)</sup>

<sup>1)</sup> Condensate outlets only suitable for connecting peristaltic pumps.

<sup>2)</sup> Each gas path equipped with a peristaltic pump. The supply voltage corresponds with that of the main unit.

### Consumables and accessories

Item no.	Description
4410 001	Automatic condensate drain 11 LD V 38
4410004	Automatic condensate drain AK 20, PVDF *
4410005	Condensate trap GL 1; glass, 0.4 L *
4410019	Condensate trap GL 2; glass, 1 L *
44920035011	Condensate pump hose, Tygon (Norpren), straight hose nipple
44920035012	Condensate pump hose, Tygon (Norpren), angled hose nipple
44920035013	Condensate pump hose, Tygon (Norpren), straight and angled hose nipple
44920035016	Condensate pump hose, Tygon (Norpren), angled hose nipple and screw connection (metric)
44920035017	Condensate pump hose, Tygon (Norpren), angled hose nipple and screw connection (US)
44921222102	Peristaltic pump CPsingle-OEM-AC X2 with angled hose nipple
44921222104	Peristaltic pump CPsingle-OEM-AC X2 with screw-in hose connection (metric)
44921222105	Peristaltic pump CPsingle-OEM-AC X2 with screw-in hose connection (US)

\*approved for non-flammable and flammable gases explosion class IIB.