

Sample Gas Cooler EGK 2 Ex



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

The EGK models provide a CFC-free, 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 controller is self-checking. Significant deviation from the preset is signaled by a status output. A bi-color LED on the front shows 4 different operating conditions.

Condensate is removed either into condensate vessels or by automatic condensate drainers which can be attached to the heat exchangers within the cooler's outer contour.

- **ATEX certificate Zone 1 (Cat. 2G)**
- **CFC-free**
- **Nominal cooling capacity 583 Btu/hr**
- **1 or 2 heat exchangers can be inserted: up to 4 gas paths**
- **Self-checking with status output**
- **4 operational conditions displayed**
- **Simple operation and test**
- **Easy to install**

Technical Data

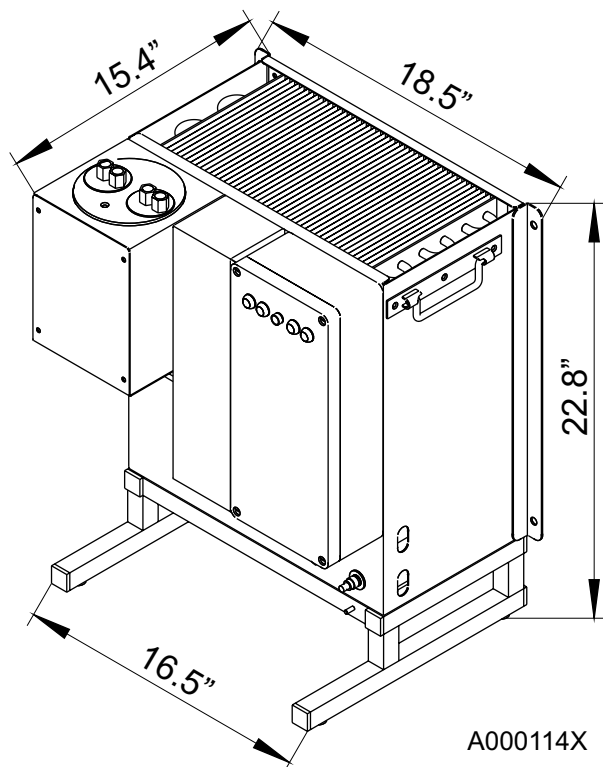
| | |
|---|------------------------------------|
| ATEX-class | II 2 G Ex px e mb q [ia] IIC T4 Gb |
| Ready for operation | after max. 20 minutes |
| Cooling capacity (at 25°C) | > 583 Btu/hr |
| Ambient temperature | 32-115 °F |
| Gas outlet dewpoint (preset) | approx. 40 °F |
| Power supply | 230 V, 50 Hz or 115 V, 60 Hz |
| Power consumption | 250 VA (230 V) 300 VA (115 V) |
| Fuse | motor protection switch |
| Potential-free status outputs (fail-safe) | 250 V / 3 A AC 24 V / 1 A DC |
| Protection class electrically | IP 54 |
| Housing material | stainless steel / polyester |
| Installation | upright or against wall |
| Dimensions (H x W x D) approx. | 27.6 x 19.7 x 19.7 in. |
| Weight w/2 heat exchangers | approx. 82 lb. |

Display

Status LED with 4 conditions:

| | |
|-----------------|---|
| Green: | Temperature in range |
| Green flashing: | Temperature in range, compressor is running |
| Red: | Temperature off range, cooling operation |
| Red flashing: | Cooler stopped or service required |

Dimensions (Inch)



Heat Exchanger

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

The following table shows cooler performance assuming the following conditions: $\tau_e=120^\circ\text{F}$ and $\vartheta_G=160^\circ\text{F}$. Indicated is the v_{\max} in lpm cooled air (i.e. after the moisture has condensed). If the actual values stay below the parameters τ_e and ϑ_G , v_{\max} can be increased. For example (TG), instead of $\tau_e=120^\circ\text{F}$, $\vartheta_G=160^\circ\text{F}$ and $v=5.7$ lpm the values $\tau_e=105^\circ\text{F}$, $\vartheta_G=160^\circ\text{F}$ a maximum flow rate of $v=7.1$ lpm could be achieved.

Please contact one of Buhler's application specialists for assistance and further information.

| Heat exchanger | TS | TG | TV | DTS | DTG | DTV ⁴⁾ |
|---|------------------------|-------------|-------------|-----------------|-----------------|-------------------|
| Flow rate v_{\max} ¹⁾ | 8.8 lpm | 4.7 lpm | 2.1 lpm | 2*4.2 lpm | 2*2.3 lpm | 2*1.9 lpm |
| Inlet dew point $\tau_{e,\max}$ ¹⁾ | 175 °F | 175 °F | 150 °F | 175 °F | 150 °F | 150 °F |
| Gas inlet temperature $\vartheta_{G,\max}$ ^{1) und 3)} | 355(275) °F | 275 °F | 275 °F | 355(275) °F | 275 °F | 275 °F |
| Max. cooling capacity Q_{\max} | 427 Btu/hr | 218 Btu/hr | 114 Btu/hr | 427 Btu/hr | 218 Btu/hr | 175 Btu/hr |
| Gas pressure p_{\max} | 2321 psig | 44 psig | 44 psig | 363 psig | 44 psig | 29 psig |
| Pressure drop Δp ($v=150$ l/h) | 0.12 psig | 0.12 psig | 0.12 psig | each 0.07 psig | each 0.07 psig | each 0.22 psig |
| Dead volume V_{tot} | 4.2 cu. in. | 2.9 cu. in. | 7.9 cu. in. | 1.7/1.5 cu. in. | 1.5/1.5 cu. in. | each 1.3 cu. in. |
| Sample gas connections | G 1/4" i ²⁾ | GL 14 | DN 4/6 | tube 6 mm | GL 14 | DN 4/6 |
| Condensate outlet connections | G 3/8" i ²⁾ | GL 25 | G 3/8" i | tube 10 mm | GI 184 | DN 5/8 |

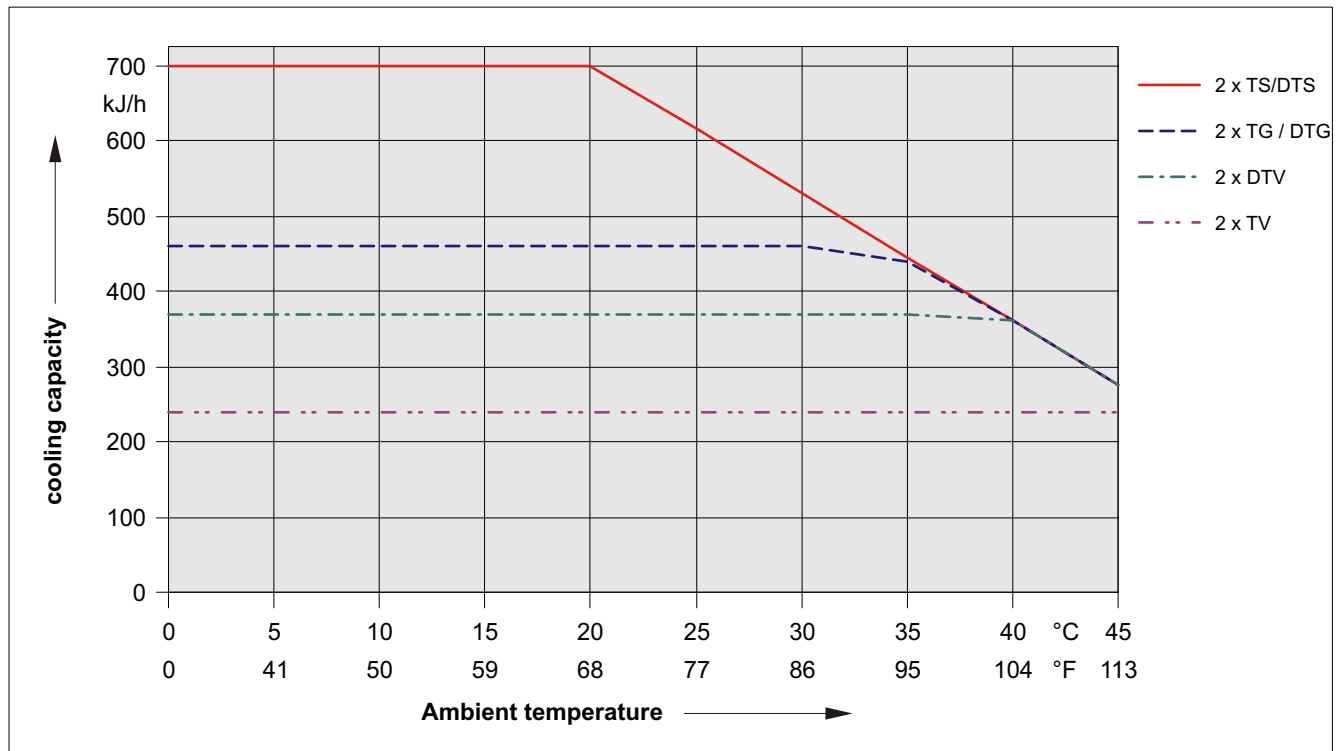
¹⁾ With maximum heat transfer of the heat exchanger and max. cooling capacity of the cooler

²⁾ NPT-threads upon request

³⁾ Values in parentheses due to temperature class

⁴⁾ Automatic condensate drainers and glass vessels not available

Performance Data



Please indicate with order

Please extract the part number for the cooler fulfilling your requirements from the type code below.

Please note: Each gas path should be equipped with a peristaltic pump or an automatic condensate drain.

| | | | | | | | | | | | | |
|---|---|---|---|---|--|--|--|--|---|---|---|---|
| Part No. | 4 | 5 | 9 | 0 | | | | | 0 | 0 | 0 | EGK 2Ex |
| Power Supply¹⁾ | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | 115 V |
| | 2 | | | | | | | | | | | 230 V |
| Gas Path / Material / Version | | | | | | | | | | | | |
| | 0 | 0 | 0 | | | | | | | | | Without heat exchanger |
| 1 Gas Path / Material / Version | | | | | | | | | | | | |
| | 1 | 1 | 0 | | | | | | | | | 1 single path heat exchanger / stainless steel / TS |
| | 1 | 2 | 0 | | | | | | | | | 1 single path heat exchanger / glass / TG |
| | 1 | 3 | 0 | | | | | | | | | 1 single path heat exchanger / PVDF / TV-SS |
| 2 Gas Paths / Material / Version | | | | | | | | | | | | |
| | 2 | 1 | 0 | | | | | | | | | 2 single path heat exchangers / stainless steel / TS |
| | 2 | 2 | 0 | | | | | | | | | 2 single path heat exchangers / glass / TG |
| | 2 | 3 | 0 | | | | | | | | | 2 single path heat exchangers / PVDF / TV-SS |
| | 2 | 6 | 0 | | | | | | | | | 1 dual path heat exchanger / stainless steel / DTS |
| | 2 | 7 | 0 | | | | | | | | | 1 dual path heat exchanger / glass / DTG |
| | 2 | 8 | 0 | | | | | | | | | 1 dual path heat exchanger / PVDF / DTV ²⁾ |
| 3 Gas Paths / Material / Version | | | | | | | | | | | | |
| | 3 | 1 | 0 | | | | | | | | | 1 single path + 1 dual path heat exchanger / stainless steel / TS+DTS |
| | 3 | 2 | 0 | | | | | | | | | 1 single path + 1 dual path heat exchanger / glass / TG+DTG |
| | 3 | 3 | 0 | | | | | | | | | 1 single path + 1 dual path heat exchanger / PVDF / TV-SS+DTV ²⁾ |
| 4 Gas Paths / Material / Version | | | | | | | | | | | | |
| | 4 | 6 | 0 | | | | | | | | | 2 dual path heat exchangers / stainless steel / DTS |
| | 4 | 7 | 0 | | | | | | | | | 2 dual path heat exchangers / glass / TG |
| | 4 | 8 | 0 | | | | | | | | | 2 dual path heat exchangers / PVDF / DTV ²⁾ |
| Condensate Discharge | | | | | | | | | | | | |
| | | | | | | | | | 0 | | | Without condensate discharge |
| | | | | | | | | | 3 | | | AK20 assembled |
| | | | | | | | | | 4 | | | 11 LD V38 assembled |

¹⁾ Operating the cooler in the hazardous area is allowed only with sufficient motor protector switch.

²⁾ Automatic condensate drains or condensate vessel cannot be connected.

Accessories

| | |
|---------------|---|
| 91 320 200 09 | Motor protection switch mounted outside of hazardous area for cooler 230V/50Hz |
| 91 320 200 29 | Motor protection switch mounted outside of hazardous area for cooler 115V/60Hz |
| 91 320 200 32 | Motor protection switch mounted inside of hazardous area for cooler 230V/50Hz |
| 91 320 200 35 | Motor protection switch mounted inside of hazardous area for cooler 115V/60Hz |
| 44 100 05 | Condensate vessel GL 1; glass, 0,4 l |
| 44 100 19 | Condensate vessel GL 2; glass, 1 l |