Sample Gas Cooler
PKE 42

Accurate measurement of gases requires samples with stable dew points even under harsh ambient conditions.

The PKE 42 cooling system consists of semiconductor Peltier cooling elements with an aluminum cooling block. Fitted into the block is a removable, high-efficiency heat exchanger made of stainless steel, DURAN-glass or PVDF with 1 or 2 gas paths.

The unit maintains a constant outlet dew point of 40 °F with an electronic controller. The temperature of the cooling block is shown on an LED-display. The status is indicated by a flashing LED which shows high or low temperature alarms and operates together with relay to halt the flow of sample gas in fail-safe mode.

The relay maybe used to control the sample gas pump when the cooler reaches the desired temperature range.

Condensate is removed either by peristaltic pumps, by automatic condensate drains, or condensate vessels.

- **Compact design**
- **Quick installation**
- **No maintenance required**
- **Low noise**
- **Efficient heat exchangers made of stainless steel, Duran-glass or PVDF**
- **Nominal cooling capacity 140 kJ/h**
- **Dew point stability 0.1°C**
- **Status display and output**
- **Cooling temperature display**
- **Heat exchanger with 1 or 2 gas paths**

DE 44 0011
12/2006

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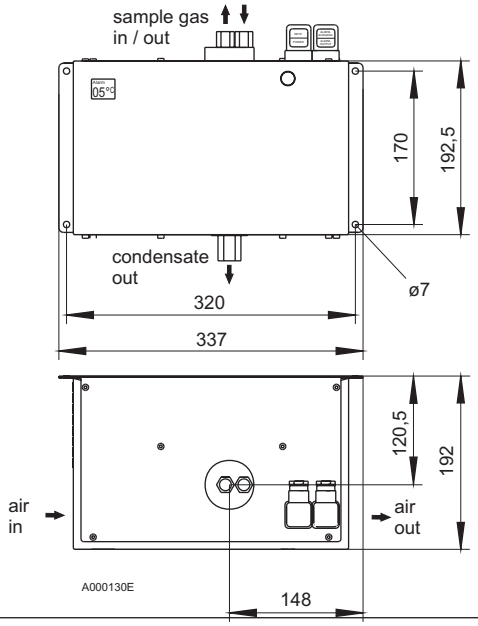
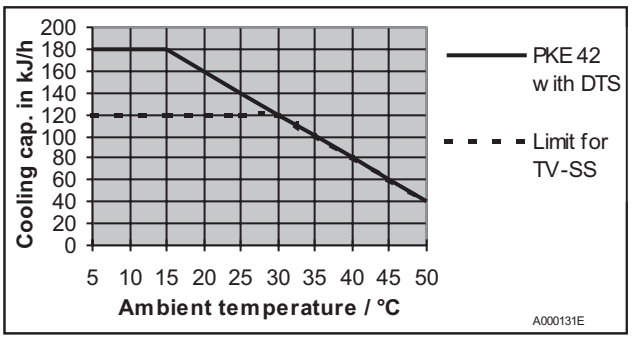
Technical Data

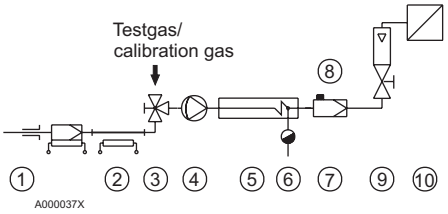
Ready for operation		after max. 10 minutes
Cooling capacity (at 25°C)		140 kJ/h
Ambient temperature		+5..50°C
Factory set dew point		5°C
Dew point noise static		0,1K
Drift over full specified range		± 1,5K
Power supply		115 or 230V 50/60Hz, plug Acc. to DIN 43650
Power consumption		max. 350 VA
Status output	Electrical spec.	max. 230V AC, 150 VDC 2A, 50 VA free of potential
	Plug	acc. to DIN 43650
Protection class		IP 20
Housing		stainless steel
Weight		approx. 11 kg



Performance Data



Typical Installation Diagram:



1 Sample probe
2 Sample tube
3 3 way valve
4 Sample gas pump
5 Sample gas cooler EGK-1/2
6 Automatic condensate drain or perist. pump
7 Moisture detector
8 Fine filter
9 Flow meter
10 Analyser

For models and specs of components see individual data sheets.

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, dewpoint 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: τ_e=50°C and ϑ_G=70°C. Indicated is the v_{max} in Nl/h cooled air (i.e. after the moisture has condensated). If the actual values stay below the parameters τ_e and ϑ_G, v_{max} can be increased. For example (TG), instead of τ_e= 50°C, ϑ_G = 70°C and v = 345 l/h the values τ_e=40°C, ϑ_G=70°C and a maximum flow rate of v=425 l/h could be achieved.

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

Heat Exchanger	**TS**	**TG**	**TV-SS**	**DTS**	**DTG**	**DTV** [3]
Flow rate v_{max} [1]	500 l/h	400 l/h	235 l/h	2 x 250 l/h	2 x 200 l/h	2 x 160 l/hl
Inlet dewpoint $\tau_{e,max}$ [1]	80 °C	80 °C	65 °C	80 °C	65 °C	65 °C
Gas inlet temperature. $\vartheta_{G,max}$ [1]	180 °C	140 °C	140 °C	180 °C	140 °C	140°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 Δp (v=150 l/h)	8 mbar	8 mbar	8 mbar	each 5 mbar	each 5 mbar	each 15 mbar
Dead volume V_{tot}	69 ml	48 ml	129 ml	28 / 25 ml	28 / 25 ml	21 / 21 ml
Sample gas connections	G 1/4" i [2]	GL 14	DN 4/6	tube 6 mm	GL 14	DN 4/6
Condensate out connections	G 3/8" i [2]	GL 25	G 3/8" i	tube 10 mm	GL 18	DN 4/6

[1] max. cooling capacity of the cooler must be considered [2] NPT-threads upon request [3] Con only be used with peristaltic pumps

Please indicate with order

Basic units

44 70 099	PKE 42, 230V, 50/60Hz
44 70 199	PKE 42, 115V, 50/60Hz

Heat exchangers

4510023	TS, stainless steel 1.4571
4510013	TG, Duran-glass
4501004	TV, PVDF
4501026	DTS, stainless steel 1.4571
4501027	DTG, Duran-glass
4501028	DTV, PVDF

Accessories

45 10 008	Automatic condensate drain AK 5.2
44 10 005	Condensate vessel GL1, 0,4l
45 10 122	Peristaltic pump 0.3 l/h, 230V, separate mounting
45 10 222	Peristaltic pump 0.3 l/h, 115V, separate mounting
44 70 799	Peristaltic pump 0.3 l/h, 230V, mounted
44 70 899	Peristaltic pump 0.3 l/h, 115V, mounted