Sample Gas Cooler PKE 4

Accurate measurement of gas components requires gas samples with stable dew points even under harsh ambient conditions.
The PKE types provide a cooling system consisting of semiconductor peltier elements cooling an aluminium cooling block. Fitted into the block is a removeable high efficient heat exchanger made of stainless steel, DURAN-glass or PVDF. The PKE 4 is designed for moderate ambient temperature and gas energy with typically 150 l/h at a gas temperature of about 158°F (70°C) and an inlet dew point of about 104°F (40°C) (appox. 5 Vol%). For higher ambient temperatures up to a maximum of 122°F (50°C) you can order the PKA 4-HA.
The dew point of 41°F (5°C) is kept constant by an electronic controller. The temperature in °C of the cooling block is shown on a LED-display. The status is indicated by a flashing LED which shows too high or low temperature (set block temperature ±3K/5°F) and operates together with a relais in fail-safe mode.
The relais could be used to control the sample gas pump in such a mode that the gas flow is turned on when the cooler reaches the wanted temperature range.
Depending on the systems basic principle the condensate can be removed either by peristaltic pumps or by automatic condensate drains or condensate vessels.

- **compact design**
- **short installation time**
- **no maintenance required**
- **low noise**
- **efficient heat exchangers made of stainless steel, duran-glass or PVDF**
- **nominal cooling capacity 66 btu/h**
- **dew point stability 0,2 °F**
- **status display and -output**
- **display of cooling temperature**
- **version for high ambient temperatures**

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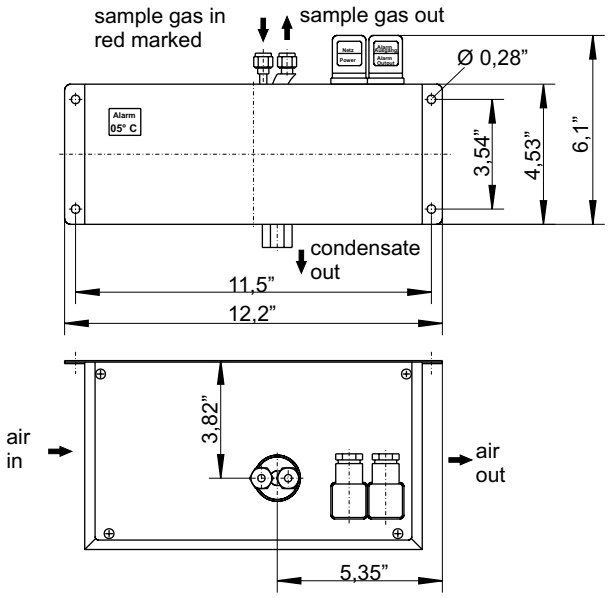
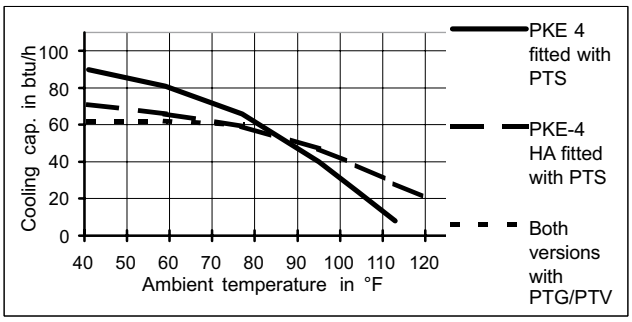
technical data (data in parentheses are for PKE 4-HA)

Ready for operation		after max. 10 minutes
cooling capacity at 77°F		66 btu/h (57 btu/h)
ambient temperature		+40...105°F (122°F)
factory set dew point		41°F / 5°C
dew point noise static		0,2°F (0,5°F)
drift over full specified range		± 2,7°F (± 1,8°F)
power supply		115 or 230V 50/60Hz, plug acc. to DIN 43650
power consumption		max. 140 VA
status output	electrical spec.	max. 230V AC, 150 VDC 2A, 50 VA, 30 W free of potential
	plug	acc. to DIN 43650
protection class		IP 20
housing		stainless steel
packing dimensions approx.		14,5 x 10 x 11,5 inches
weight incl. heat exchanger		approx. 6,5 kg





Performance data

The diagram shows the avaiable cooling capacity depending on the actual ambient temperature. The curves are related to the different heat exchangers.

heat exchanger

The energy content of the sample gas and as a result the required cooling capacity is determined by 3 parameters: gas temperature ϑ_G, dew point τ_e (moisture content) and flow v.

The outlet dew point raises with increasing the energy content of the gas due to physical rules. The following limits of the flow v are given for a "normal" operating point of τ_e=104°F (40°C) und ϑ_G=158°F (70°C).

Indicated is the maximum flow in Nl/h cooled air i.e. after the moisture has condensated.

If the real values stay below those parameters for ϑ_G and/ or τ_e, v_{max} can be increased. Physical interdependences are rather complicated so we stop theory here.

Please contact us for assistance or use our cooler adaption programme.

heat exchanger	PTS (steel)	PTG (glass)	PTV (PVDF)
flow rate v_{max} [1)]	300 l/h	180 l/h	180 l /h
inlet dew point $\tau_{e,max}$ [1)]	150 °F	150 °F	150 °F
gas inlet temp. $\vartheta_{G,max}$ [1)]	360 °F	280 °F	280 °F
gas pressure p_{max}	2320 psi	43 psi	43 psi
pressure drop Δp (Q=150 l/h)	0,15 psi	0,15 psi	0,15 psi
death volume	16 ml	16 ml	18 ml
sample gas connections	Swagelok 6mm	GL 14	DN 4/6
condensate out connection	G 3/8" i	GL 25	G 3/8" i

[1)] consider the maximum cooling capacity of cooler

Please indicate with order

basic units

44 60 099	PKE 4, 230V, 50/60Hz
44 60 199	PKE 4, 115V, 50/60Hz
44 60 299	PKE 4-HA, 230V, 50/60Hz
44 60 399	PKE 4-HA, 115V, 50/60 Hz
heat exchangers	
44 47 999	PTS, stainless steel 1.4571
44 45 999	PTG, Duran-glass
44 46 999	PTV, PVDF

accessories

45 10 008	automatic condensate drain AK 5.2
44 10 005	condensate vessel GL1, 0,4l
45 10 122	persistalic pump 0,3 l/h, 230V, separate mounting
45 10 222	persistalic pump 0,3 l/h, 115V, separate mounting

we reserve the right to amend specification