EC-L-2G/SR25.2

Gas Cooler Series EC®

Compact Version EC-L
for 2 x 250 Nl/h or 1 x 500 Nl/h

Special Features

- **Upgradeable to a complete gas conditioning unit**
- **Patented Jet Stream heat exchangers in 3 standard materials**
- **Gas flow 2 x 250 or 1 x 500 Nl/h**
- **Ambient pre-cooling stage(s)**
- **Ambient temperature up to 45 °C (up to 113 °F)**
- **Dew point stability ±0.25 °C (±0.45 °F)**
- **Outlet dew point adjustable from +2 °C to +7 °C (35.6 °F to 44.6 °F)**
- **Status alarm contact**
- **Optimum reliability**
- **Self-controlled**
- **CFC-free**

Application

The M&C gas cooler EC-L is used in gas analysis to lower the dew point of humid gas to avoid condensation in the analyser(s). An extremely stable and low gas dew point avoids water vapour cross-sensitivity and volumetric errors. Additionally components for the gas conditioning like filter or pump can be integrated.

Description

Compact, maintenance-free and self-controlling. Intelligent detailed solutions provide optimum cooling of the sample gas and direct separation of condensate.

The new controlled compressor cooling system and the special design of the jet stream heat exchanger guarantee an optimum dew point reduction to a low, stable value. Another advantage is a short time of contact between gas and condensate due to the jet stream design. Thus washing out effects of water soluble gas components are minimized. An additional pre-drainage device can be mounted in applications with high water content. This one or two stage ambient pre-cooler unit reduces the inlet dew point respectively the load of the main cooling stage.

The condensate should be removed with integrated small peristaltic pumps SR25.2 or optionally by external condensate traps AD... respectively collection vessels TG../TK..

The simple construction enables heat exchangers of different materials to be used depending on the application. Heat exchangers made from glass, stainless steel or PVDF are to be ordered optionally.

The digital indicator in the front panel displays the cooling temperature. The function of the cooler can be externally controlled via the alarm contact. The factory settings for the alarm limits are < +2 °C (< 35.6 °F) and > +8 °C (> 46.4 °F).

The gas cooler EC-L can be equipped with 2 Jet-Stream heat exchangers with a total flow capacity of max. 500 Nl/h, either for 2 separate sample lines 2 x 250 Nl/h or one sample line 1 x 500 Nl/h.

The compact and light weight construction allows a simple and space-saving installation. The EC-L gas coolers are self controlling and maintenance free in operation.

If necessary, the cooler can be upgraded to a complete gas conditioning unit. Therefore a mounting plate with the needed devices like a pump or a filter with liquid alarm sensor is fixed at the cooler.

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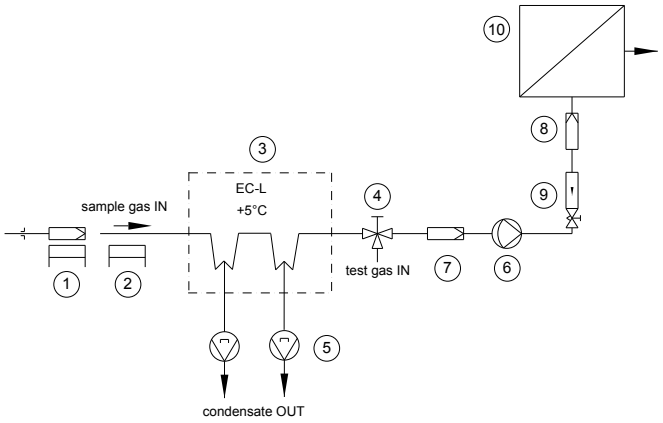
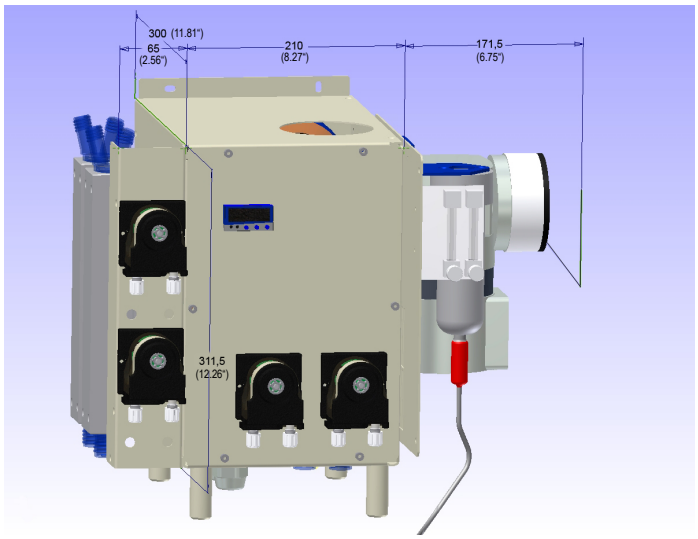
Application example for EC-L

1 Heated filter sample probe or dilution probe
2 Heated sample line
3 Cooler EC-L
4 3-way ball valve
5 Peristaltic pump SR25.2
6 Diaphragm pump
7 Fine filter FP-2T-D with liquid alarm LA1S
8 Aerosol filter CLF-5 /W optional according to application
9 Flow meter FM40, 25-250 Nl/h
10 Analysers



Dimensions

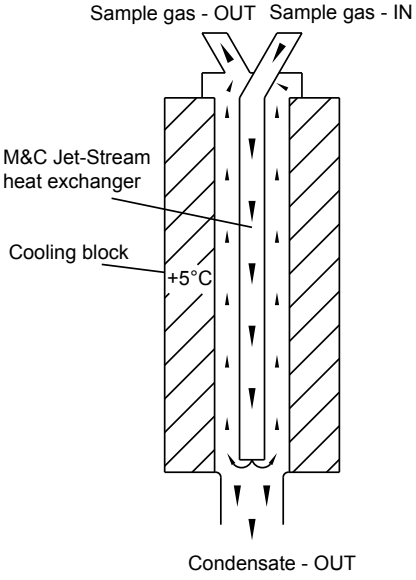
Compact gas cooler EC-L with pre-cooler, filter, liquid alarm sensor and diaphragm pump



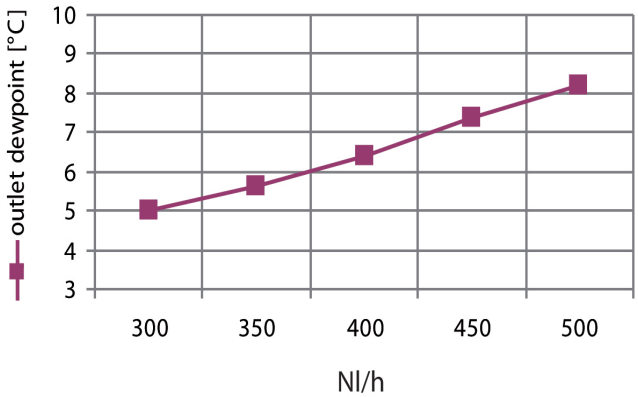
Dimensions in mm

Drawing shows EC-L with two heat exchangers out of glass, two pre-cooling stages, peristaltic pumps, a filter with liquid alarm sensor and a diaphragm pump .
Heat exchanger(s), peristaltic pump(s), filter with liquid alarm sensor and diaphragm pump to be ordered optionally!

Functional diagram of M&C Jet-Stream heat exchanger



Sample gas outlet dew point stability for EC-L-2G



Sample gas outlet dew point stability at gas inlet dew point of 80 °C.
Heat exchangers are connected in series.
Characteristics of heat exchanger out of PVDF or stainless steel on request.

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Technical Data

Gas cooler series EC®	Version EC-L
Part-No.: Basic cooler without heat exchanger, 230 V 50 Hz	02 K 4000X
Part-No.: Basic cooler without heat exchanger, 115 V 50-60 Hz	02 K 4000Xa
Number of heat exchangers	2
Ambient temperature	+10 up to +45 °C (50 °F up to 113 °F)
Sample outlet dew point	range of adjustment: +2 °C to +7 °C (35.6 °F to 44.6 °F) , factory setting: +5 °C (41 °F)
Dew point stability	at constant conditions < ±0.25 °C (< ±0.45 °F)
Sample inlet temperature***	max. 180 °C (max. 356 °F)
Sample inlet dew point***	max. 80 °C (max. 176 °F)
Total cooling capacity	144 kJ/h at +10 to +45 °C (50 °F up to 113 °F) ambient temperature
Ready for operation	< 15 min.
Main power connection / power consumption	230 V AC* or 115 V AC**(a) -15 % / +10 %, 50/60 Hz, max. 200 VA start up current: 230 V 50 Hz = 2.5 A / 115 V 60 Hz = 4.5 A
Electrical connection	terminals 2.5 mm², 2x PG11 cable gland (with FM-approval conduit-hub 1/2" NPT)
Status alarm-2 contacts, potential free	contact rating 250 VAC, 2 A, 500 VA, 50 W, alarm limit settings < +2 °C (<35.6 °F) and > +8 °C (> 46.4 °F)*
Case protection / Electrical standard	IP20 EN60529 / EN 61010
Method of mounting / Case colour	wall mounting / case colour grey, RAL 9003
Dimension	210 x 380 x 350 mm (w x h x d), height including cooler feet and depth including peristaltic pump
Weight	17.6 kg (38.8 lbs) (with 2 SR25.2 and 2 glass heat exchangers)

Options

Options for basis cooler	EC-L		
Heat exchanger type	ECL-G	ECL-PV	ECL-SS
Part No.	97 K 0605	97 K 0610	97 K 0600
Material of heat exchanger	Duran glass®	PVDF	SS 316Ti
Max. gas flow rate per h.e.	250 Nl/h***	250 Nl/h***	250 Nl/h***
Gas press. max. bar abs.[3]	2 / 3 [2]	3	10*
Sample gas connection	GL18 for ø 6 mm o.d. tube*	Tube ø 6 mm*	Tube ø 6 mm
Condensate connection	GL25 for ø 12 mm tube* ø 8 mm or ø 10 mm	G3/8"i	G3/8"i or 3/8 NPT**
ΔP at max. flow rate	1 mbar	1 mbar	1 mbar
Stagnant space approximately	50 ml (0.013 gal)	50 ml (0.013 gal)	50 ml (0.013 gal)
Peristaltic pump SR25.2	1 pc. incorporated in the cooler, compl. installed, Part No.: 01 P 9125 cooler weight plus 0.6 kg (1.32 lb) per pump		
One ambient pre-cooling stage, without heat exchanger, completely installed, Part-No.: 02 K 4020			
Two ambient pre-cooling stages, without heat exchanger, completely installed, Part-No.: 02 K 4022			
Mounting bracket for installing up to two peristaltic pumps, Part No.: 02 K 4030			
Peristaltic pump for pre-cooling stage, one peristaltic pump for each pre-cooling stage needed, Part No.: 01 P 9125			
Mounting plate for gas conditioning components like filter or pump, completely installed, Part-No.: 97 K 0631			
Analog output for cooler temperature on request			

* Standard, other version on request.
** Option
*** Maximum values in technical data's must be rated in consideration of total cooling capacity at 25 °C (77 °F) ambient temperature.
[2] With GL-Connecting adapter.
[3] With SR25.2 max. 2 bar abs.

Order example:

1 cooler EC-L with 2 heat exchangers out of glass ECL-G and 2 peristaltic pumps SR25.2, power 115 V 60 Hz:
Part. No. 1 x 02 K 4000Xa; 2 x 97 K 0605; 2 x 01 P 9125

GL adapter and tube fittings for the connection of differerent tube diameters at the heat exchanger see chapter 11, data sheet 11.5 and 11.6.