ECM-2

Gas Cooler Series EC®

Compact Versions ECM-1 and ECM-EX2-1
for 1 x 250 Nl/h
Compact Versions ECM-2 and ECM-EX2-2
for 2 x 150 Nl/h

Special Features

- **Small dimensions and lightweight design**
- **ATEX version for hazardous zone 2 areas**
- **Gas flow 1 x 250 or 2 x 150 Nl/h**
- **Jet-Stream heat exchangers in various materials**
- **Ambient temperature up to 50 °C [122 °F]**
- **Outlet dew point adjustable from +2 to +7 °C [35.6 to +44.6 °F]**
- **Dew point stability ± 0.1 °C [±0.18 °F]**
- **Digital temperature display**
- **Configurable status alarm contact**
- **Compact wall-mount housing**
- **High reliability**

Application

The M&C gas cooler ECM is used in gas analysis to lower the dew point of humid gas to prevent condensation in the analyzer. An extremely stable and low gas dew point minimizes water vapour cross-sensitivity and volumetric errors.

Description

The ECM gas cooler is compact, self-controlling and requires only minimum maintenance. Detailed solutions ensure optimum cooling of the sample gas with minimal washout effects and guarantee reliable separation of the condensate.

The forced ventilation compressor cooling system with new control and the special design of the Jet-Stream heat exchangers ensure optimum dew point reduction to a low, stable value and reliable condensate separation. External condensate pre-separation is not required under normal conditions.

The condensate is optionally discharged by means of the integrated peristaltic pumps SR25.2 or externally by condensate traps AD or collecting vessels TG/TK. The practical design allows the installation of heat exchangers made of different materials depending on the application. The heat exchangers can be ordered optionally.

The digital display on the front panel shows the current cooler temperature. The cooler function can be monitored externally via an alarm contact. The alarm limits are set to < +1.5 °C [34.7 °F] and > +8.5 °C [47.3 °F] at the factory.

The 1-channel gas cooler ECM-1 can be equipped with a Jet-Stream heat exchanger for a flow rate of max. 250 Nl/h.

The 2-channel gas cooler ECM-2 can be equipped with two Jet-Stream heat exchangers for a flow rate of max. 150 Nl/h each.

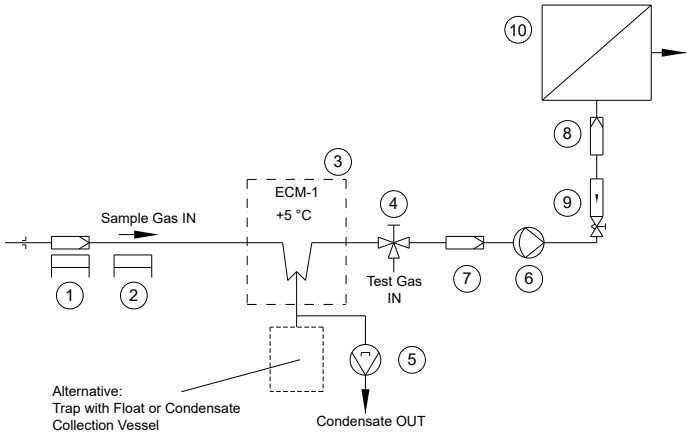
The ATEX versions ECM-EX2-1 and ECM-EX2-2 can be used in Ex zone 2 and can also be equipped with up to 2 standard SR25.2 peristaltic pumps.

The compact and lightweight design ensures space-saving and easy installation in gas conditioning systems. The ECM gas coolers are self-monitoring and require only minimum maintenance.

M&C TechGroup Germany GmbH • Rehhecke 79 • 40885 Ratingen • Germany
info@mc-techgroup.com • www.mc-techgroup.com • P. +49 2102 . 935 - 0

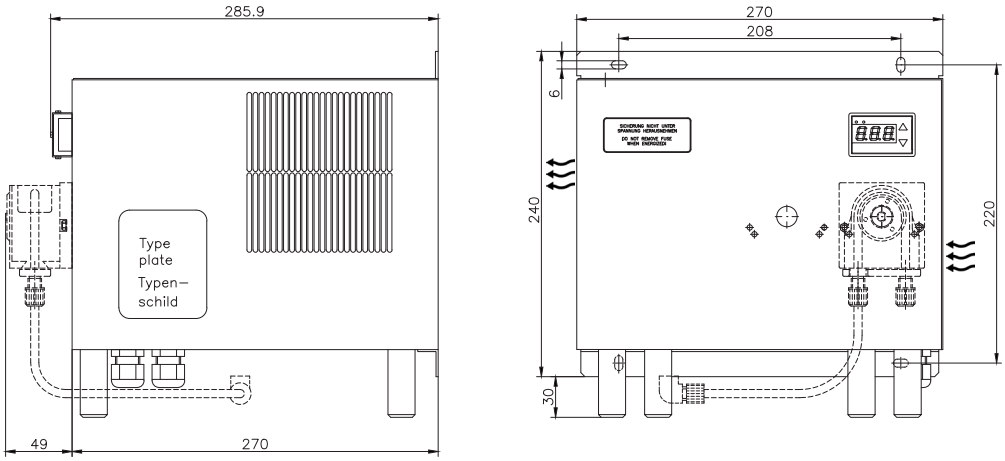
Application Example for ECM-1

1 Heated filter sample probe SP210-H or SP2000-H
2 Heated sample line 4M4/6
3 Cooler ECM-1G
4 3-way ball valve 3L/PV-1
5 Peristaltic pump SR25.2
6 Sample gas pump, e.g. MP-F10
7 Fine filter FP-2T-D with liquid alarm LA1
8 Aerosol filter CLF-5/W optionally according to application
9 Flow meter FM10 or FM40, 25-250 Nl/h
10 Analyzers, e.g. GenTwo PMA1000



Dimensions

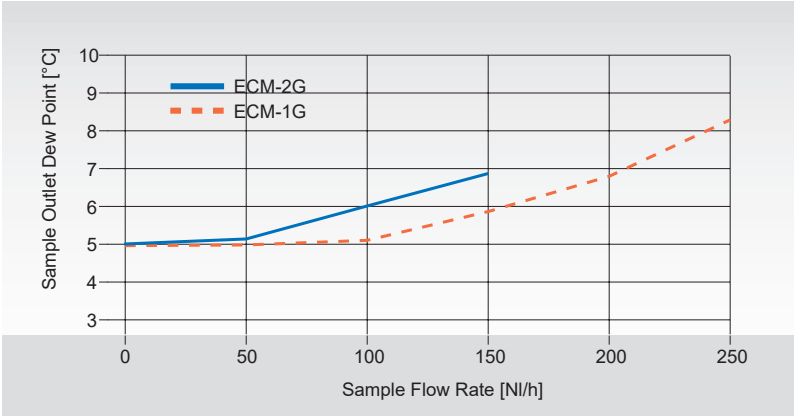
Compact Gas Cooler ECM-1/ECM-2/ECM-EX2-1/ECM-EX2-2



Dimensions in mm [Inches]
Direction of the air flow

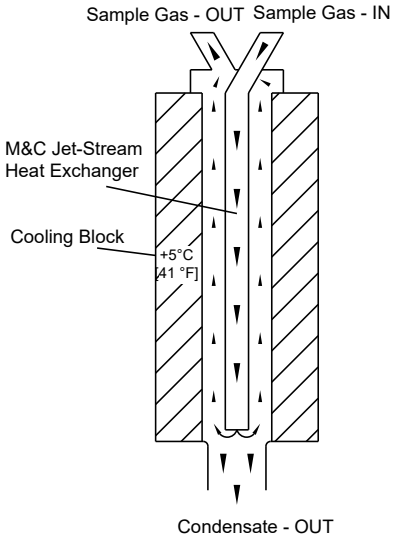
Drawing shows ECM-1
Heat exchanger(s) and peristaltic pump(s) to be ordered optionally.

Sample Gas Outlet Dew Point Stability



Sample gas outlet dew point stability at gas inlet dew point of 60 °C [140 °F].
Characteristics of heat exchanger out of PVDF or stainless steel upon request.

Functioning Diagram of M&C Jet-Stream Heat Exchanger



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Technical Data

Basic cooler without heat exchanger(s)	Version ECM-1	Version ECM-2	Version ECM-EX2-1	Version ECM-EX2-2
Part No. for 240 V, 50-60 Hz	02K7500X	02K7510X	No	No
Part No. for 230 V, 50-60 Hz	No	No	02K7650X	02K7655X
Part No. for 120 V, 50-60 Hz	02K7500XA	02K7510XA	No	No
Part No. for 115 V, 50-60 Hz	No	No	02K7650XA	02K7655XA
Max. number of possible heat exchanger(s)	1	2	1	2
Ambient temperature	+10 up to +50 °C [+50 to +122 °F]			
Max relative humidity	80 % at temperatures up to 50 °C, non-condensing			
Storage temperature	-20 to +60 °C [-4 to +140 °F]			
Sample outlet dew point	Range of adjustment: +2 to +7 °C [+35.6 to +44.6 °F], factory setting: +5 °C [+41 °F]			
Dew point stability	At constant conditions < ±0.1 °C [±0.18 °F]			
Sample inlet temperature*	Max. 180 °C [356 °F]		Max. +180 °C [356 °F] if cooler is mounted in Ex zone with temperature class T3 Max. +120 °C [248 °F] if cooler is mounted in Ex zone with temperature class T4	
Sample inlet dew point*	Max. 80 °C [176 °F]			
Total cooling capacity	144 kJ/h at +10 to +50 °C [+50 to +122 °F] ambient			
Ready for operation	< 15 min.			
Main power connection	240 V -15/+10 %, 50-60 Hz or 120 V -15/+10 %, 50-60 Hz,		230 V -15/+10 %, 50-60 Hz or 115 V -15/+10 %, 50-60 Hz,	
Power consumption	Max. 200 VA (start up current at 240 V -15/+10 %, 50-60 Hz = 2.5 A at 120 V -15/+10 %, 50-60 Hz = 4.5 A)		Max. 200 VA (start up current at 230 V/50-60 Hz = 2.5 A, at 115 V, 50-60 Hz = 4.5 A)	
Electrical connection	Terminals: 2.5 mm², tightening torque for terminals X1 and X3: 0.5 to 0.6 N m			
Cable glands	2 x M20 x 1.5, clamping range: 6-12 mm			
Status alarm	1 x free configurable status alarm with 2 x potential free change-over contacts, contact rating: 250 V AC, 2 A; 500 VA; 50 W, factory-set alarm limits: < +1.5 °C [34.7 °F] and > +8.5 °C [47.3 °F] with an outlet dew point of +5 °C [+41 °F], an alarm window of 3 °C [5.4 °F] and an alarm hysteresis of 1 °C [1.8 °F]			
ATEX	No		230 V/115 V : Ex II 3G Ex nA nC IIC T4 Gc (Zul.-Nr.: BVS 16 ATEX E 055 X)	
Electrical safety	EN 61010-1, UL Std. No. 61010-1(3 Edition) and 61010.1-04 61010-2-011		EN 61010-1	
Installation sites	The cooler is intended for indoor use. The maximum altitude is 2,000 m above sea level.			
Overvoltage category	II			
Pollution degree	2			
Refrigerant	R134a, content: 130 g [≈ 0.3 lb], max. operating pressure: 17 bar			
System of protection	IP20 EN60529			
Method of mounting	Wall-mounting			
Case colour	RAL 9003			
Dimensions (W x H x D)	270 x 270 x 316 mm [≈ 10.6" x 10.6" x 12.4"]			
Weight	230 V version: 12 kg [≈ 26.5 lbs] 115 V version: 13.5 kg [≈ 29.8 lbs]			

* Maximum values in technical data must be rated in consideration of total cooling capacity at 25 °C [77 °F] ambient temperature and 5 °C [41 °F] outlet dew point.

Options (standard sizes are highlighted)

Options for basic cooler	ECM-1and ECM-EX2-1			ECM-2 and ECM-EX2-2		
Heat exchanger type	ECM-1G	ECM-1PV	ECM-1SS	ECM-2G	ECM-2PV	ECM-2SS
Part No.	93K0140	93K0170	93K0160	97K0100	97K0110	97K0115
Material of heat exchanger	Duran® glass	PVDF	SS 316Ti	Duran® glass	PVDF	SS 316Ti
Max. gas flow rate per heat exchanger*	250 Nl/h			150 Nl/h*		
Max. gas pressure[2)]	2/3[1)] bar abs.	3 bar abs.	**10 bar abs.**	2/3[1)] bar abs.	3 bar abs.	**10 bar abs.**
Sample gas connections	GL 18 for **ø 6 mm** OD tube	G 1/4" female	**G 1/4" female** or 1/4"NPT	GL 18 for **ø 6 mm** OD tube	Tube **ø 6 mm**	Tube **ø 6 mm**
Condensate connection	GL 25 for **ø 12 mm** tube ø 8 or 10 mm	G 3/8" female	**G 3/8" female** or 3/8" NPT	GL 25 for **ø 12 mm** tube ø 8 or 10 mm	G 3/8" female	**G3/8" female** or 3/8" NPT
ΔP at max. flow rate	1 mbar					
Stagnant space approximately	100 ml			40 ml	25 ml	30 ml
Peristaltic pump SR25.2	1 x integrated into the cooler, compl. installed, Part No.: 01P9125 cooler weight plus 0.6 kg [≈ 1.3 lbs] per pump					

* Maximum values in technical data must be rated in consideration of total cooling capacity at 25 °C [77 °F] ambient temperature and 5 °C [41 °F] outlet dew point.
2) With GL connecting adapter.
3) With SR25.2 max. 2 bar abs

Please note: Nl/h and Nl/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.
Duran® glass is a brand name for borosilicate glass produced by the German company Duran Group GmbH.

Order example:

1 x cooler ECM-2 with 2 x heat exchangers out of glass ECM-2G and 2 x peristaltic pumps SR25.2, power 115 V/60 Hz
Part numbers: 1 x 02K7510XA; 2 x 97K0100; 2 x 01P9125

GL adapters and tube fittings for connecting different tube diameters at the heat exchanger see data sheets "Fittings for GL Glass Connections" and "Flexible and rigid tube fittings, plugs and connectors with barbed fitting".

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