

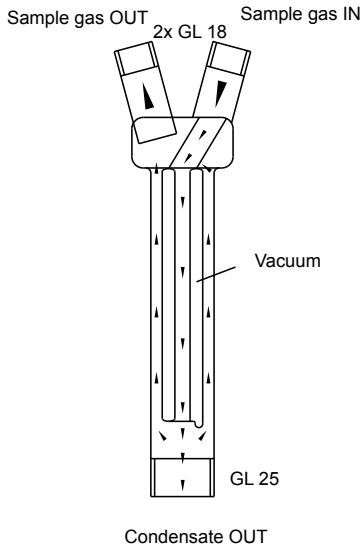
M&C Jet-Stream Heat Exchanger Series EC/ECP®

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M&C gas coolers types EC../ECP../VC.. are used in gas analysis to lower the dewpoint of humid gas to prevent condensation in the analyser.

An extremely stable and low gas dewpoint avoids water vapour cross-sensitivity and volumetric errors. The special design of "Jet-Stream" heat exchangers guarantees optimal heat transfer and reliable condensate separation, thus obviating the need for additional pre-drainage devices in standard applications. The advantages of M&C EC/ECP Jet-Stream heat exchangers are:

- The distance of contact for sample gas and condensate is extremely short in M&C EC/ECP Jet-Stream heat exchangers. This minimises washing out effects and the critical detection limits of gases are improved.
- M&C EC../ECP... gas cooler concepts ensure an extremely stable dewpoint, enabling calibration of the water vapour cross-sensitivity.
- The small dead volume of the M&C EC/ECP Jet-Stream heat exchangers guarantees a short response time even if the gas flow rates are low.
- The unique conception of the M&C EC/ECP Jet-Stream heat exchangers also ensures reliable condensate separation at higher gas velocities.
- EC/ECP M&C Jet-Stream heat exchangers in various material – Duran® glass, PVDF and stainless steel 316 – allow an optimal adaptation to different applications.
- The easy replacement or retrofitting of the heat exchangers in M&C VC../EC../ECP... gas coolers is unique as well.



M&C Table of H₂O saturation for gases in a temperature range of -100 °C up to +90 °C and normal pressure 1 bar abs.

°C H ₂ O dewpoint	Vol.% H ₂ O	g/Nm ³ H ₂ O	°C H ₂ O dewpoint	Vol.% H ₂ O	g/Nm ³ H ₂ O	ml/hr * condensate quantity
- 100	0,0000139	0,0000111	0	0,602	4,84	
- 90	0,00000955	0,0000767	+ 1	0,649	5,21	
- 80	0,0000540	0,000434	+ 2	0,696	5,59	
- 70	0,000258	0,00207	+ 3	0,750	6,02	
- 60	0,00107	0,00857	+ 4	0,803	6,45	
- 55	0,00207	0,0166	+ 5	0,861	6,91	= 0,0
- 50	0,00388	0,0312	+ 6	0,922	7,41	
- 48	0,00496	0,0399	+ 7	0,988	7,94	
- 46	0,00631	0,0507	+ 8	1,06	8,51	
- 44	0,00800	0,0642	+ 9	1,13	9,10	
- 42	0,0102	0,0816	+ 10	1,21	9,74	= 0,3
- 40	0,0127	0,102	+ 11	1,29	10,40	
- 38	0,0159	0,127	+ 12	1,38	11,10	
- 36	0,0198	0,159	+ 13	1,48	11,90	
- 34	0,0246	0,197	+ 14	1,58	12,70	
- 32	0,0304	0,244	+ 15	1,68	13,50	
- 30	0,0375	0,301	+ 16	1,79	14,40	
- 28	0,0461	0,371	+ 17	1,91	15,40	
- 26	0,0565	0,454	+ 18	2,04	16,40	
- 24	0,0690	0,554	+ 19	2,17	17,40	
- 22	0,0840	0,675	+ 20	2,31	18,50	= 1,2
- 20	0,102	0,816	+ 21	2,46	19,70	
- 19	0,112	0,899	+ 22	2,61	21,00	
- 18	0,123	0,989	+ 23	2,77	22,30	
- 17	0,135	1,09	+ 24	2,94	23,70	
- 16	0,148	1,19	+ 25	3,13	25,10	= 1,9
- 15	0,163	1,31	+ 26	3,32	26,70	
- 14	0,179	1,43	+ 27	3,52	28,30	
- 13	0,196	1,57	+ 28	3,73	30,00	
- 12	0,214	1,72	+ 29	3,95	31,80	
- 11	0,234	1,88	+ 30	4,19	33,60	= 2,8
- 10	0,256	2,06	+ 35	5,55	44,60	= 4,0
- 9	0,280	2,25	+ 40	7,28	58,50	= 5,6
- 8	0,305	2,45	+ 45	9,46	76,00	= 7,7
- 7	0,333	2,68	+ 50	12,20	97,80	= 10,5
- 6	0,363	2,92	+ 55	15,50	125	= 14,1
- 5	0,396	3,18	+ 60	19,70	158	= 15,0
- 4	0,431	3,46	+ 70	30,70	247	= 34,8
- 3	0,469	3,77	+ 80	46,70	376	= 69,6
- 2	0,510	4,10	+ 90	69,20	556	= 179,0
- 1	0,555	4,46				<

* At 100 NI/hr sample gas flow and dewpoint of +5 °C.