



**INFORME INCERTESES EQUIPS AUTOMÀTICS DE MESURA
ESTACIÓ CAN LLOMPART (LAT-33/14)**

TAULA RESUM

Paràmetre	Còdi FIINN	h_{iv}^1 ($\mu\text{g}/\text{m}^3$)	c_t^2 ($\mu\text{g}/\text{m}^3$)	Incertesa (%) (valor màxim acceptat) ³	Incertesa (%) (valor absolut)	Resultat
SO ₂	07042001_1_38	350	532	15	7	● CORRECTE
NO	07042001_7_8	200	249	15	11	● CORRECTE
NO ₂	07042001_8_8	200	383	15	8	● CORRECTE
O ₃	07042001_14_6	180	200	15	11	● CORRECTE

¹ Valor límit horari (Real Decret 102/2011, Annex I)

² Concentració del gas d'assaig

³ Real Decret 102/2011, Annex V

Contaminant: SO₂

[1] Càlcul de $U_{r,z}$ [$U_{r,z} = \frac{S_{r,z}}{\sqrt{n}}$] (S'agafa el pitjor valor entre Bellver, Foners, Ciutadella i Sant Antoni)

Concentració màxima recta de calibratge ($\mu\text{g}/\text{m}^3$)	Error absolut ($\mu\text{g}/\text{m}^3$)	Incertesa (%)	$S_{r,z}$ ($\mu\text{g}/\text{m}^3$)	n	$U_{r,z}$ ($\mu\text{g}/\text{m}^3$)	
399	0,2394	0,10	0,1995	10	0,0631	
399	0,0000	0,00	0,0000		0,0000	
399	-1,3298	0,70	1,3963		0,4415	
399	0,5319	0,53	1,0572		0,3343	
399	-0,7979	0,62	1,2367		0,3911	
399	-0,4255	0,18	0,3590		0,1135	
399	-0,0532	0,11	0,2194		0,0694	

$U_{r,z}$ màxim = 0,4415

[2] Càlcul de $U_{r,f}$ [$U_{r,f} = \frac{h_{iv}s}{c_t\sqrt{n}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	s ($\mu\text{g}/\text{m}^3$)	$U_{r,f}$ ($\mu\text{g}/\text{m}^3$)
532	350	16,8906	3,5145

[4] Càlcul de $U_{i,lv}$ [$U_{i,lv} = \frac{X_{i,lv} h_{iv}}{100\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	$X_{i,lv}$ (%)	$U_{i,lv}$ ($\mu\text{g}/\text{m}^3$)
532	350	0,6550	1,3235

[5] Càlcul de U_{gp} [$U_{gp} = \frac{h_{iv}b_{gp}\Delta gp}{c_t\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	b_{gp} ($\frac{\mu\text{g}}{\text{m}^3\text{kPa}}$)	Δgp (kPa)	U_{gp} ($\mu\text{g}/\text{m}^3$)
532	350	0,133	30	1,5155

[3] Càlcul de $X_{i,lv}$ [$X_{i,lv} = \frac{|\bar{y} - y_{calc.}| \cdot 100}{c_t}$]

c_t ($\mu\text{g}/\text{m}^3$)	Y ($\mu\text{g}/\text{m}^3$)	$Y_{calc.}$ ($\mu\text{g}/\text{m}^3$)	$X_{i,lv}$ (%)
532	519	522	0,6550
532	537	541	
532	559	562	
532	529	533	

[6] Càlcul de U_{gt} [$U_{gt} = \frac{h_{lv} b_{gt} \Delta g t}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gt} ($\frac{\mu\text{g}}{\text{m}^3\text{K}}$)	$\Delta g t$ (K)	U_{gt} ($\mu\text{g}/\text{m}^3$)
532	350	1,090	30	12,4274

[7] Càlcul de U_{st} [$U_{st} = \frac{h_{lv} b_{gt} \Delta T}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gt} ($\frac{\mu\text{g}}{\text{m}^3\text{K}}$)	ΔT (K)	U_{st} ($\mu\text{g}/\text{m}^3$)
532	350	1,090	10	4,1425

[8] Càlcul de U_v [$U_v = \frac{h_{lv} b_v \Delta V}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_v ($\frac{\mu\text{g}}{\text{m}^3\text{V}}$)	ΔV (V)	U_v
532	350	0,0266	8	0,0808

[9] Càlcul de b_{H_2O} [$b_{H_2O} = \frac{1}{c_{H_2O}} [X_{H_2O,Z} + (X_{H_2O,ct} - X_{H_2O,Z}) \frac{h_{lv}}{c_t}]$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	c_{H_2O} ($\frac{\text{mmol}}{\text{mol}}$)	$X_{H_2O,Z}$ ($\frac{\text{nmol}}{\text{mol}}$)	$X_{H_2O,ct}$ ($\frac{\text{nmol}}{\text{mol}}$)	b_{H_2O} ($\frac{\text{nmol}}{\text{mmol}}$)
532	350	19	-0,1	-2,33	-0,0789

[10] Càlcul de U_{H_2O} [$U_{H_2O} = b_{H_2O} \sqrt{\frac{c_{H_2O,max}^2 + c_{H_2O,max} c_{H_2O,min} + c_{H_2O,min}^2}{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	$c_{H_2O,max}$ ($\frac{\text{mmol}}{\text{mol}}$)	$c_{H_2O,min}$ ($\frac{\text{mmol}}{\text{mol}}$)	b_{H_2O} ($\frac{\text{nmol}}{\text{mmol}}$)	U_{H_2O} ($\mu\text{g}/\text{m}^3$)
532	21	6	-0,0789	-2,9747

[14] Càlcul $U_{D_{sc}}$ [$U_{D_{sc}} = \frac{h_{lv} D_{sc}}{100 \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	D_{sc} (%)	$U_{D_{sc}}$ ($\mu\text{g}/\text{m}^3$)
532	350	1	2,0207

[16] Càlcul $U_{D_{1,lv}}$ [$U_{D_{1,lv}} = \frac{h_{lv} D_{1,lv}}{100 \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	$D_{1,lv}$ (%)	$U_{D_{1,lv}}$ ($\mu\text{g}/\text{m}^3$)
532	350	5	10,1037

[11] Altres interferents (dades importants)

Interf.	$X_{i,z}$	$X_{i,ct}$	$C_{i,max}$	$C_{i,min}$	C_i
NH ₃	0,1	-0,33	28,3	0	200
H ₂ S	-0,07	-0,67	3,53	0	200
NO	2,8	4,0	160,2	0	500
NO ₂	0,23	0,67	104,5	0	200
m-xilè ¹	0,07	1,0	0,009	0	1

¹ En $\mu\text{mol}/\text{mols}$

[12] Altres interferents (resultats obtinguts)

Interf.	c_t	b_i	U_i
NH ₃	532	-0,0009	-0,0397
H ₂ S	532	-0,0023	-0,0126
NO	532	0,0072	1,7657
NO ₂	532	0,0025	0,4166
m-xilè ¹	532	0,6819	0,0095

¹ En $\mu\text{mol}/\text{mols}$

[13] Interferents (resultats globals)

c_t ($\mu\text{g}/\text{m}^3$)	$U_{\text{interf.,negatiu}}$ ($\mu\text{g}/\text{m}^3$)	$U_{\text{interf.,positiu}}$ ($\mu\text{g}/\text{m}^3$)
532	0,0416	1,8142

[15] Càlcul $U_{D_{1,z}}$ [$U_{D_{1,z}} = \frac{D_{1,z}}{\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	$D_{1,z}$ ($\mu\text{g}/\text{m}^3$)	$U_{D_{1,z}}$ ($\mu\text{g}/\text{m}^3$)
532	1,3298	0,7678

[17] Càlcul U_{res} [$U_{res} = \frac{\text{Resolució}}{2\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	Resolució ($\mu\text{g}/\text{m}^3$)	U_{res} ($\mu\text{g}/\text{m}^3$)
532	0,2659	0,0768

[18] Càlcul $U_{patró}$ [$U_{patró} = \sqrt{(\frac{\partial C_{patró}}{\partial MR})^2 U_{MR}^2 + (\frac{\partial C_{patró}}{\partial A})^2 U_A^2 + (\frac{\partial C_{patró}}{\partial G})^2 U_G^2}$]

c_t ($\mu\text{g}/\text{m}^3$)	C_{MR} ($\mu\text{g}/\text{m}^3$)	U_{MR} ($\mu\text{g}/\text{m}^3$)	Fact. Diluc.	Cabal aire (lpm)	Cabal gas (lpm)	U_A ($\mu\text{g}/\text{m}^3$)	U_G ($\mu\text{g}/\text{m}^3$)	$U_{patró}$ ($\mu\text{g}/\text{m}^3$)
532	53.750	402,2	101,0	6	0,0600	0,1077	0,000492	5,5783
	53.484	402,2	100,6		0,0603			5,5899
	53.484	402,2	100,6		0,0603			5,5899
	53.484	402,2	100,6		0,0603			5,5899
532								
532								
532								
532								

[19] Resultats finals

c_t ($\mu\text{g}/\text{m}^3$)	U_z ($\mu\text{g}/\text{m}^3$)	$U_{combinada}$ ($\mu\text{g}/\text{m}^3$)	K	I ($\mu\text{g}/\text{m}^3$)	I (%)	Resultat calibratge
532	1,5355	18,4575	2	36,9097	6,9403	CORRECTE

Contaminant: NO

[1] Càlcul de $U_{r,z}$ [$U_{r,z} = \frac{S_{r,z}}{\sqrt{n}}$] (S'agafa el pitjor valor entre Bellver, Foners, Ciutadella i Sant Antoni)

Concentració màxima recta de calibratge ($\mu\text{g}/\text{m}^3$)	Error absolut ($\mu\text{g}/\text{m}^3$)	Incertesa (%)	$S_{r,z}$ ($\mu\text{g}/\text{m}^3$)	n	$U_{r,z}$ ($\mu\text{g}/\text{m}^3$)
499	-0,4989	0,10	0,2495	10	0,0789
499	-0,8856	0,11	0,2744		0,0868
499	-0,5114	0,20	0,4989		0,1578
499	-0,3992	0,06	0,1497		0,0473
499	-0,4241	0,07	0,1746		0,0552
499	-0,3118	0,07	0,1746		0,0552
499	-0,3867	0,07	0,1746		0,0552
499	-0,3368	0,05	0,1247		0,0394

$U_{r,z}$ màxim = 0,1578

[2] Càlcul de $U_{r,f}$ [$U_{r,f} = \frac{h_{lv}s}{c_t\sqrt{n}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	s ($\mu\text{g}/\text{m}^3$)	$U_{r,f}$ ($\mu\text{g}/\text{m}^3$)
249	200	3,6721	0,9309

[4] Càlcul de $U_{i,lv}$ [$U_{i,lv} = \frac{X_{i,lv} h_{lv}}{100\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	$X_{i,lv}$ (%)	$U_{i,lv}$ ($\mu\text{g}/\text{m}^3$)
249	200	0,1483	0,1713

[5] Càlcul de U_{gp} [$U_{gp} = \frac{h_{lv}b_{gp}\Delta gp}{c_t\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gp} ($\frac{\mu\text{g}}{\text{m}^3 \text{ kPa}}$)	Δgp (kPa)	U_{gp} ($\mu\text{g}/\text{m}^3$)
249	200	-	30	-

[3] Càlcul de $X_{i,lv}$ [$X_{i,lv} = \frac{|\bar{y} - y_{calc}| \cdot 100}{c_t}$]

c_t ($\mu\text{g}/\text{m}^3$)	Y ($\mu\text{g}/\text{m}^3$)	$Y_{calc.}$ ($\mu\text{g}/\text{m}^3$)	$X_{i,lv}$ (%)
249	252	252	0,1483
249	244	245	
249	245	246	
249	251	251	

[6] Càlcul de U_{gt} [$U_{gt} = \frac{h_{lv}b_{gt}\Delta gt}{c_t\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gt} ($\frac{\mu\text{g}}{\text{m}^3 \text{ K}}$)	Δgt (K)	U_{gt} ($\mu\text{g}/\text{m}^3$)
249	200	-	30	-

[7] Càlcul de U_{st} [$U_{st} = \frac{h_{lv}b_{gt}\Delta T}{c_t\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gt} ($\frac{\mu\text{g}}{\text{m}^3 \text{ K}}$)	ΔT (K)	U_{st} ($\mu\text{g}/\text{m}^3$)
249	200	-	10	-

[8] Càlcul de U_v [$U_v = \frac{h_{lv}b_v\Delta V}{c_t\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_v ($\frac{\mu\text{g}}{\text{m}^3 \text{ V}}$)	ΔV (V)	U_v ($\mu\text{g}/\text{m}^3$)
249	200	0,2994	8	1,1085

[11] Altres interferents (dades importants)

Interf.	$X_{i,z}$	$X_{i,ct}$	$C_{i,m\grave{a}x.}$	$C_{i,min.}$	C_i
NH ₃	0,0	-0,09	28,3	0	200
CO ₂	-0,17	0,025	700	393	500
O ₃	-0,003	-25,7	90	0	200

[9] Càlcul de b_{H_2O} [$b_{H_2O} = \frac{1}{c_{H_2O}} [X_{H_2O,Z} + (X_{H_2O,ct} - X_{H_2O,Z}) \frac{h_{lv}}{c_t}]$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	c_{H_2O} ($\frac{\text{mmol}}{\text{mol}}$)	$X_{H_2O,Z}$ ($\frac{\text{nmol}}{\text{mol}}$)	$X_{H_2O,ct}$ ($\frac{\text{nmol}}{\text{mol}}$)	b_{H_2O} ($\frac{\text{nmol}}{\text{mmol}}$)
249	200	19	0	-12,9	-0,5443

[12] Altres interferents (resultats obtinguts)

Interf.	c_t	b_i	U_i
NH ₃	249	-3,608e-4	-0,0073
CO ₂	249	-2,734e-5	-0,0189
O ₃	249	-0,1030	-6,6772

[10] Càlcul de U_{H_2O} [$U_{H_2O} = b_{H_2O} \sqrt{\frac{c_{H_2O,max.}^2 + c_{H_2O,max.} c_{H_2O,min.} + c_{H_2O,min.}^2}{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	$c_{H_2O,max.}$ ($\frac{\text{mmol}}{\text{mol}}$)	$c_{H_2O,min.}$ ($\frac{\text{mmol}}{\text{mol}}$)	b_{H_2O} ($\frac{\text{nmol}}{\text{mmol}}$)	U_{H_2O} ($\mu\text{g}/\text{m}^3$)
249	21	6	-0,5443	-9,6257

[13] Interferents (resultats globals)

c_t ($\mu\text{g}/\text{m}^3$)	$U_{interf.,negatiu}$ ($\mu\text{g}/\text{m}^3$)	$U_{interf.,positiu}$ ($\mu\text{g}/\text{m}^3$)
249	6,6773	0

[14] Càlcul $U_{D_{SC}}$ [$U_{D_{SC}} = \frac{h_{iv} D_{SC}}{100\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	D_{SC} (%)	$U_{D_{SC}}$ ($\mu\text{g}/\text{m}^3$)
249	200	1	1,1547

[15] Càlcul $U_{D_{1,z}}$ [$U_{D_{1,z}} = \frac{D_{1,z}}{\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	$D_{1,z}$ ($\mu\text{g}/\text{m}^3$)	$U_{D_{1,z}}$ ($\mu\text{g}/\text{m}^3$)
249	0,6237	0,3601

[16] Càlcul $U_{D_{1,lv}}$ [$U_{D_{1,lv}} = \frac{h_{iv} D_{1,lv}}{100\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	$D_{1,lv}$ (%)	$U_{D_{1,lv}}$ ($\mu\text{g}/\text{m}^3$)
249	200	5	5,7735

[17] Càlcul U_{res} [$U_{res} = \frac{\text{Resolució}}{2\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	Resolució ($\mu\text{g}/\text{m}^3$)	U_{res} ($\mu\text{g}/\text{m}^3$)
249	0,1247	0,0360

[18] Càlcul $U_{patró}$ [$U_{patró} = \sqrt{\left(\frac{\partial C_{patró}}{\partial MR}\right)^2 U_{MR}^2 + \left(\frac{\partial C_{patró}}{\partial A}\right)^2 U_A^2 + \left(\frac{\partial C_{patró}}{\partial G}\right)^2 U_G^2}$]

c_t ($\mu\text{g}/\text{m}^3$)	C_{MR} ($\mu\text{g}/\text{m}^3$)	U_{MR} ($\mu\text{g}/\text{m}^3$)	Fact. Diluc.	Cabal aire (lpm)	Cabal gas (lpm)	U_A ($\mu\text{g}/\text{m}^3$)	U_G ($\mu\text{g}/\text{m}^3$)	$U_{patró}$ ($\mu\text{g}/\text{m}^3$)
249	23.700	152,1	95,0		0,0638			2,4790
249	24.323	158,2	97,5		0,0622			2,4994
249	24.323	158,2	97,5		0,0622			2,4994
249	24.323	158,2	97,5		0,0622			2,4994
				6		0,0526	0,000244	

[19] Resultats finals

c_t ($\mu\text{g}/\text{m}^3$)	U_z ($\mu\text{g}/\text{m}^3$)	$U_{combinada}$ ($\mu\text{g}/\text{m}^3$)	K	I ($\mu\text{g}/\text{m}^3$)	I (%)	Resultat calibratge
249	0,7202	13,4509	2	26,9019	10,7836	CORRECTE

Contaminant: NO₂

[1] Càlcul de $U_{r,z}$ [$U_{r,z} = \frac{S_{r,z}}{\sqrt{n}}$] (S'agafa el pitjor valor entre Bellver, Foners, Ciutadella i Sant Antoni)

Concentració màxima recta de calibratge ($\mu\text{g}/\text{m}^3$)	Error absolut ($\mu\text{g}/\text{m}^3$)	Incertesa (%)	$S_{r,z}$ ($\mu\text{g}/\text{m}^3$)	n	$U_{r,z}$ ($\mu\text{g}/\text{m}^3$)
781	-0,73	0,12	0,4687	10	0,1482
774	-0,55	0,13	0,5028		0,1590
774	-0,56	0,27	1,0442		0,3302
774	-0,82	0,40	1,5470		0,4892
774	-0,19	0,09	0,3481		0,1101
774	-0,52	0,25	0,9669		0,3058
774	0,30	0,14	0,5415		0,1712
774	-0,21	0,10	0,3868		0,1223
774	-0,05	0,02	0,0774		0,0245

$U_{r,z}$ màxim = 0,4892

[2] Càlcul de $U_{r,f}$ [$U_{r,f} = \frac{h_{lv} s}{c_t \sqrt{n}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	s ($\mu\text{g}/\text{m}^3$)	$U_{r,f}$ ($\mu\text{g}/\text{m}^3$)
383	200	7,3946	1,2213

[4] Càlcul de $U_{l,lv}$ [$U_{l,lv} = \frac{X_{l,lv} h_{lv}}{100 \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	$X_{l,lv}$ (%)	$U_{l,lv}$ ($\mu\text{g}/\text{m}^3$)
383	200	1,0475	1,2095

[5] Càlcul de U_{gp} [$U_{gp} = \frac{h_{lv} b_{gp} \Delta gp}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gp} ($\frac{\mu\text{g}}{\text{m}^3 \text{ kPa}}$)	Δgp (kPa)	U_{gp} ($\mu\text{g}/\text{m}^3$)
383	200	-	30	-

[3] Càlcul de $X_{l,lv}$ [$X_{l,lv} = \frac{|\bar{y} - y_{\text{calc}}| \cdot 100}{c_t}$]

c_t ($\mu\text{g}/\text{m}^3$)	Y ($\mu\text{g}/\text{m}^3$)	Y _{calc.} ($\mu\text{g}/\text{m}^3$)	$X_{l,lv}$ (%)
383	375	371	1,0475
383	384	381	
383	368	363	
383	371	367	

[6] Càlcul de U_{gt} [$U_{gt} = \frac{h_{lv} b_{gt} \Delta gt}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gt} ($\frac{\mu\text{g}}{\text{m}^3 \text{ K}}$)	Δgt (K)	U_{gt} ($\mu\text{g}/\text{m}^3$)
383	200	-	30	-

[7] Càlcul de U_{st} [$U_{st} = \frac{h_{lv} b_{gt} \Delta T}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_{gt} ($\frac{\mu\text{g}}{\text{m}^3 \text{ K}}$)	ΔT (K)	U_{st} ($\mu\text{g}/\text{m}^3$)
383	200	-	10	-

[8] Càlcul de U_v [$U_v = \frac{h_{lv} b_v \Delta V}{c_t \sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	b_v ($\frac{\mu\text{g}}{\text{m}^3 \text{ V}}$)	ΔV (V)	U_v ($\mu\text{g}/\text{m}^3$)
383	200	0,4595	8	1,1085

[11] Altres interferents (dades importants)

Interf.	$X_{i,z}$	$X_{i,ct}$	$C_{i,m\grave{a}x.}$	$C_{i,min.}$	C_i
NH ₃	0,0	-0,09	28,3	0	200
CO ₂	-0,17	0,025	700	393	500
O ₃	-0,003	-25,7	90	0	200

[9] Càlcul de b_{H_2O} [$b_{H_2O} = \frac{1}{c_{H_2O}} [X_{H_2O,Z} + (X_{H_2O,ct} - X_{H_2O,Z}) \frac{h_{lv}}{c_t}]$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{lv} ($\mu\text{g}/\text{m}^3$)	c_{H_2O} ($\frac{\text{mmol}}{\text{mol}}$)	$X_{H_2O,Z}$ ($\frac{\text{nmol}}{\text{mol}}$)	$X_{H_2O,ct}$ ($\frac{\text{nmol}}{\text{mol}}$)	b_{H_2O} ($\frac{\text{nmol}}{\text{mmol}}$)
383	200	19	0	-12,9	-0,3546

[12] Altres interferents (resultats obtinguts)

Interf.	c_t	b_i	U_i
NH ₃	383	-2,350e-4	-0,0073
CO ₂	383	-1,363e-4	-0,1445
O ₃	383	-0,0671	-6,6778

[10] Càlcul de U_{H_2O} [$U_{H_2O} = b_{H_2O} \sqrt{\frac{c_{H_2O,m\grave{a}x.}^2 + c_{H_2O,m\grave{a}x.} c_{H_2O,min.} + c_{H_2O,min.}^2}{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	$c_{H_2O,m\grave{a}x.}$ ($\frac{\text{mmol}}{\text{mol}}$)	$c_{H_2O,min.}$ ($\frac{\text{mmol}}{\text{mol}}$)	b_{H_2O} ($\frac{\text{nmol}}{\text{mmol}}$)	U_{H_2O} ($\mu\text{g}/\text{m}^3$)
193	21	6	-0,3546	-9,6257

[13] Interferents (resultats globals)

c_t ($\mu\text{g}/\text{m}^3$)	$U_{\text{interf.,negatiu}}$ ($\mu\text{g}/\text{m}^3$)	$U_{\text{interf.,positiu}}$ ($\mu\text{g}/\text{m}^3$)
383	6,6793	0

[14] Càlcul $U_{D_{SC}}$ [$U_{D_{SC}} = \frac{h_{iv} D_{SC}}{100\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	D_{SC} (%)	$U_{D_{SC}}$ ($\mu\text{g}/\text{m}^3$)
383	200	1	1,1547

[15] Càlcul $U_{D_{1,z}}$ [$U_{D_{1,z}} = \frac{D_{1,z}}{\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	$D_{1,z}$ ($\mu\text{g}/\text{m}^3$)	$U_{D_{1,z}}$ ($\mu\text{g}/\text{m}^3$)
383	0,9573	0,5527

[16] Càlcul $U_{D_{1,lv}}$ [$U_{D_{1,lv}} = \frac{h_{iv} D_{1,lv}}{100\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	$D_{1,lv}$ (%)	$U_{D_{1,lv}}$ ($\mu\text{g}/\text{m}^3$)
383	200	5	5,7735

[17] Càlcul U_{res} [$U_{res} = \frac{\text{Resolució}}{2\sqrt{3}}$]

c_t ($\mu\text{g}/\text{m}^3$)	Resolució ($\mu\text{g}/\text{m}^3$)	U_{res} ($\mu\text{g}/\text{m}^3$)
383	0,1914	0,0553

[18] Càlcul $U_{patró}$ [$U_{patró} = \sqrt{\left(\frac{\partial C_{patró}}{\partial MR}\right)^2 U_{MR}^2 + \left(\frac{\partial C_{patró}}{\partial A}\right)^2 U_A^2 + \left(\frac{\partial C_{patró}}{\partial G}\right)^2 U_G^2}$]

c_t ($\mu\text{g}/\text{m}^3$)	C_{MR} ($\mu\text{g}/\text{m}^3$)	U_{MR} ($\mu\text{g}/\text{m}^3$)	Fact. Diluc.	Cabal aire (lpm)	Cabal gas (lpm)	U_A ($\mu\text{g}/\text{m}^3$)	U_G ($\mu\text{g}/\text{m}^3$)	$U_{patró}$ ($\mu\text{g}/\text{m}^3$)
383	36.377	233,5	95,0		0,0638			3,8051
383	37.334	242,8	97,5		0,0622			3,8365
383	37.334	242,8	97,5		0,0622			3,8365
383	37.334	242,8	97,5		0,0622			3,8365
				6		0,0807	0,000375	

[19] Resultats finals

c_t ($\mu\text{g}/\text{m}^3$)	U_z ($\mu\text{g}/\text{m}^3$)	$U_{combinada}$ ($\mu\text{g}/\text{m}^3$)	K	I ($\mu\text{g}/\text{m}^3$)	I (%)	Resultat calibratge
383	1,1054	14,4411	2	28,8698	7,5437	CORRECTE

[14] Càlcul $U_{D_{SC}}$ [$U_{D_{SC}} = \frac{h_{iv} D_{SC}}{100\sqrt{3}}$]			
c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	D_{SC} (%)	$U_{D_{SC}}$ ($\mu\text{g}/\text{m}^3$)
200	180	1	1,0393

[15] Càlcul $U_{D_{1,Z}}$ [$U_{D_{1,Z}} = \frac{D_{1,Z}}{\sqrt{3}}$]		
c_t ($\mu\text{g}/\text{m}^3$)	$D_{1,Z}$ ($\mu\text{g}/\text{m}^3$)	$U_{D_{1,Z}}$ ($\mu\text{g}/\text{m}^3$)
200	5,9940	3,4606

[16] Càlcul $U_{D_{1,lv}}$ [$U_{D_{1,lv}} = \frac{h_{iv} D_{1,lv}}{100\sqrt{3}}$]			
c_t ($\mu\text{g}/\text{m}^3$)	h_{iv} ($\mu\text{g}/\text{m}^3$)	$D_{1,lv}$ (%)	$U_{D_{1,lv}}$ ($\mu\text{g}/\text{m}^3$)
200	180	5	5,1966

[17] Càlcul U_{res} [$U_{res} = \frac{\text{Resolució}}{2\sqrt{3}}$]		
c_t ($\mu\text{g}/\text{m}^3$)	Resolució ($\mu\text{g}/\text{m}^3$)	U_{res} ($\mu\text{g}/\text{m}^3$)
200	0,1998	0,0577

[18] Càlcul $U_{patró}$ [$U_{patró} = \frac{I}{K}$]			
c_t ($\mu\text{g}/\text{m}^3$)	I	K	$U_{patró}$ ($\mu\text{g}/\text{m}^3$)
200	3,9760	2	1,9880

[19] Resultats finals						
c_t ($\mu\text{g}/\text{m}^3$)	U_z ($\mu\text{g}/\text{m}^3$)	$U_{combinada}$ ($\mu\text{g}/\text{m}^3$)	K	I ($\mu\text{g}/\text{m}^3$)	I (%)	Resultat calibratge
200	1,1535	10,9663	2	21,9326	10,9772	CORRECTE

Palma, 22 de juliol de 2014

Elaborat per: Secció de Contaminació Atmosfèrica, DIRECCIÓ GENERAL DE MEDI NATURAL, EDUCACIÓ AMBIENTAL I CANVI CLIMÀTIC, CONSELLERIA D'AGRICULTURA, MEDI AMBIENT I TERRITORI, GOVERN BALEAR.