VASCO Study

For ALICE new LS2 layout

Summary

Reference

1st TREX meeting: http://indico.cern.ch/event/325756/

2nd TREX meeting: http://indico.cern.ch/event/333087/

Work package EDMS:

ECR LHC-VAM-EC-0001 v.1.0 , EDMS 1238042

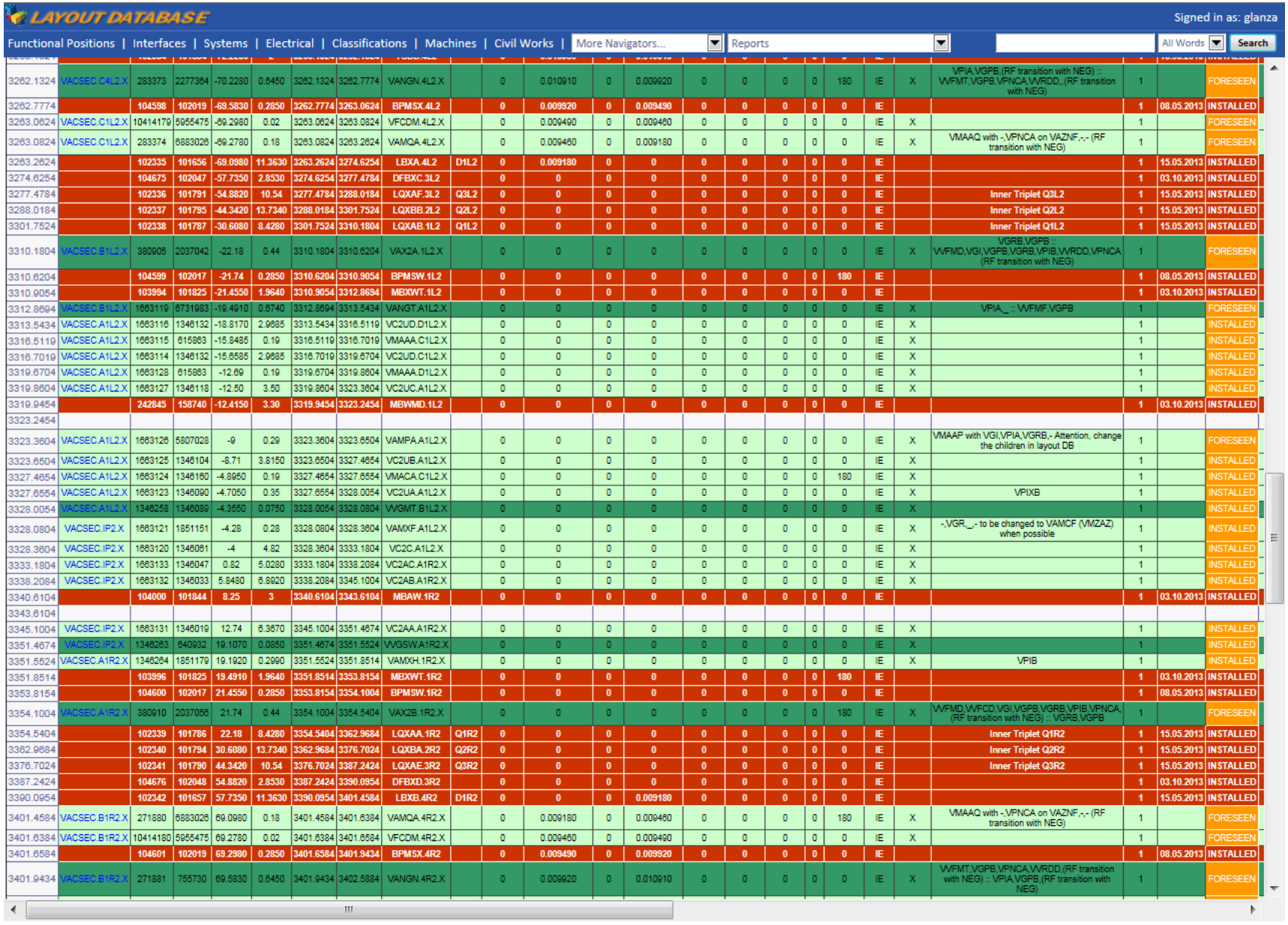
"**Change of the Warm Module in ALICE at 9 m left of the IP**"

VASCO Parameters

For ALICE new LS2 layout

Layout database

(maybe not completely upgraded after LS1?)



LAYOUT DATABASE

Signed in as: glanza

Functional Positions | Interfaces | Systems | Electrical | Classifications | Machines | Civil Works | More Navigators... | Reports | All Words | Search

3262.1324	VACSEC.C4L2.X	283373	2277364	-70.2280	0.6450	3262.1324	3262.7774	VANGN.4L2.X		0	0.010910	0	0.009920	0	0	0	0	180	IE	X	VPIA,VGPB,(RF transition with NEG) :: VVFMT,VGPB,VPNCA,VVRDD,,(RF transition with NEG)	1		FORESEEN
3262.7774		104598	102019	-69.5830	0.2850	3262.7774	3263.0624	BPMSX.4L2		0	0.009920	0	0.009490	0	0	0	0	0	IE			1	08.05.2013	INSTALLED
3263.0624	VACSEC.C1L2.X	10414179	5955475	-69.2980	0.02	3263.0624	3263.0824	VFCDM.4L2.X		0	0.009490	0	0.009460	0	0	0	0	0	IE	X		1		FORESEEN
3263.0824	VACSEC.C1L2.X	283374	6883026	-69.2780	0.18	3263.0824	3263.2624	VAMQA.4L2.X		0	0.009460	0	0.009180	0	0	0	0	0	IE	X	VMAAQ with -,VPNCA on VAZNF,-,- (RF transition with NEG)	1		FORESEEN
3263.2624		102335	101656	-69.0980	11.3630	3263.2624	3274.6254	LBXA.4L2	D1L2	0	0.009180	0	0	0	0	0	0	0	IE			1	15.05.2013	INSTALLED
3274.6254		104675	102047	-57.7350	2.8530	3274.6254	3277.4784	DFBXC.3L2		0	0	0	0	0	0	0	0	0	IE			1	03.10.2013	INSTALLED
3277.4784		102336	101791	-54.8820	10.54	3277.4784	3288.0184	LQXAF.3L2	Q3L2	0	0	0	0	0	0	0	0	0	IE		Inner Triplet Q3L2	1	15.05.2013	INSTALLED
3288.0184		102337	101795	-44.3420	13.7340	3288.0184	3301.7524	LQXBB.2L2	Q2L2	0	0	0	0	0	0	0	0	0	IE		Inner Triplet Q2L2	1	15.05.2013	INSTALLED
3301.7524		102338	101787	-30.6080	8.4280	3301.7524	3310.1804	LQXAB.1L2	Q1L2	0	0	0	0	0	0	0	0	0	IE		Inner Triplet Q1L2	1	15.05.2013	INSTALLED
3310.1804	VACSEC.B1L2.X	380905	2037042	-22.18	0.44	3310.1804	3310.6204	VAX2A.1L2.X		0	0	0	0	0	0	0	0	0	IE	X	VGRB,VGPB :: VVFMD,VGI,VGPB,VGRB,VPIB,VVRDD,VPNCA (RF transition with NEG)	1		FORESEEN
3310.6204		104599	102017	-21.74	0.2850	3310.6204	3310.9054	BPMSW.1L2		0	0	0	0	0	0	0	0	180	IE			1	08.05.2013	INSTALLED
3310.9054		103994	101825	-21.4550	1.9640	3310.9054	3312.8694	MBXWT.1L2		0	0	0	0	0	0	0	0	0	IE			1	03.10.2013	INSTALLED
3312.8694	VACSEC.B1L2.X	1663119	6731983	-19.4910	0.6740	3312.8694	3313.5434	VANGT.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X	VPIA_,:: VVFMF,VGPB	1		FORESEEN
3313.5434	VACSEC.A1L2.X	1663118	1346132	-18.8170	2.9685	3313.5434	3316.5119	VC2UD.D1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3316.5119	VACSEC.A1L2.X	1663115	615863	-15.8485	0.19	3316.5119	3316.7019	VMAAA.C1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3316.7019	VACSEC.A1L2.X	1663114	1346132	-15.6585	2.9685	3316.7019	3319.6704	VC2UD.C1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3319.6704	VACSEC.A1L2.X	1663128	615863	-12.69	0.19	3319.6704	3319.8604	VMAAA.D1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3319.8604	VACSEC.A1L2.X	1663127	1346118	-12.50	3.50	3319.8604	3323.3604	VC2UC.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3319.9454		242845	158740	-12.4150	3.30	3319.9454	3323.2454	MBWMD.1L2		0	0	0	0	0	0	0	0	0	IE			1	03.10.2013	INSTALLED
3323.2454																							
3323.3604	VACSEC.A1L2.X	1663126	5807028	-9	0.29	3323.3604	3323.6504	VAMPA.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X	VMAAP with VGI,VPIA,VGRB,- Attention, change the children in layout DB	1		FORESEEN
3323.6504	VACSEC.A1L2.X	1663125	1346104	-8.71	3.8150	3323.6504	3327.4654	VC2UB.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3327.4654	VACSEC.A1L2.X	1663124	1346160	-4.8950	0.19	3327.4654	3327.6554	VMACA.C1L2.X		0	0	0	0	0	0	0	0	180	IE	X		1		INSTALLED
3327.6554	VACSEC.A1L2.X	1663123	1346090	-4.7050	0.35	3327.6554	3328.0054	VC2UA.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X	VPIXB	1		INSTALLED
3328.0054	VACSEC.A1L2.X	1346258	1346089	-4.3550	0.0750	3328.0054	3328.0804	VVGMT.B1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3328.0804	VACSEC.IP2.X	1663121	1851151	-4.28	0.28	3328.0804	3328.3604	VAMXF.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X	-,VGR,_,- to be changed to VAMCF (VMZAZ) when possible	1		INSTALLED
3328.3604	VACSEC.IP2.X	1663120	1346061	-4	4.82	3328.3604	3333.1804	VC2C.A1L2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3333.1804	VACSEC.IP2.X	1663133	1346047	0.82	5.0280	3333.1804	3338.2084	VC2AC.A1R2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3338.2084	VACSEC.IP2.X	1663132	1346033	5.8480	6.8920	3338.2084	3345.1004	VC2AB.A1R2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3340.6104		104000	101844	8.25	3	3340.6104	3343.6104	MBAW.1R2		0	0	0	0	0	0	0	0	0	IE			1	03.10.2013	INSTALLED
3343.6104																							
3345.1004	VACSEC.IP2.X	1663131	1346019	12.74	6.3670	3345.1004	3351.4674	VC2AA.A1R2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3351.4674	VACSEC.IP2.X	1346263	640932	19.1070	0.0650	3351.4674	3351.5524	VVGSW.A1R2.X		0	0	0	0	0	0	0	0	0	IE	X		1		INSTALLED
3351.5524	VACSEC.A1R2.X	1346264	1851179	19.1920	0.2990	3351.5524	3351.8514	VAMXH.1R2.X		0	0	0	0	0	0	0	0	0	IE	X	VPIB	1		INSTALLED
3351.8514		103996	101825	19.4910	1.9640	3351.8514	3353.8154	MBXWT.1R2		0	0	0	0	0	0	0	0	180	IE			1	03.10.2013	INSTALLED
3353.8154		104600	102017	21.4550	0.2850	3353.8154	3354.1004	BPMSW.1R2		0	0	0	0	0	0	0	0	0	IE			1	08.05.2013	INSTALLED
3354.1004	VACSEC.A1R2.X	380910	2037056	21.74	0.44	3354.1004	3354.5404	VAX2B.1R2.X		0	0	0	0	0	0	0	0	180	IE	X	VVFMD,VVFCD,VGI,VGPB,VGRB,VPIB,VPNCA, (RF transition with NEG) :: VGRB,VGPB	1		FORESEEN
3354.5404		102339	101786	22.18	8.4280	3354.5404	3362.9684	LQXAA.1R2	Q1R2	0	0	0	0	0	0	0	0	0	IE		Inner Triplet Q1R2	1	15.05.2013	INSTALLED
3362.9684		102340	101794	30.6080	13.7340	3362.9684	3376.7024	LQXBA.2R2	Q2R2	0	0	0	0	0	0	0	0	0	IE		Inner Triplet Q2R2	1	15.05.2013	INSTALLED
3376.7024		102341	101790	44.3420	10.54	3376.7024	3387.2424	LQXAE.3R2	Q3R2	0	0	0	0	0	0	0	0	0	IE		Inner Triplet Q3R2	1	15.05.2013	INSTALLED
3387.2424		104676	102048	54.8820	2.8530	3387.2424	3390.0954	DFBXD.3R2		0	0	0	0	0	0	0	0	0	IE			1	03.10.2013	INSTALLED
3390.0954		102342	101657	57.7350	11.3630	3390.0954	3401.4584	LBXB.4R2	D1R2	0	0	0	0.009180	0	0	0	0	0	IE			1	15.05.2013	INSTALLED
3401.4584	VACSEC.B1R2.X	271880	6883026	69.0980	0.18	3401.4584	3401.6384	VAMQA.4R2.X		0	0.009180	0	0.009460	0	0	0	0	180	IE	X	VMAAQ with -,VPNCA on VAZNF,-,- (RF transition with NEG)	1		FORESEEN
3401.6384	VACSEC.B1R2.X	10414180	5955475	69.2780	0.02	3401.6384	3401.6584	VFCDM.4R2.X		0	0.009460	0	0.009490	0	0	0	0	0	IE	X		1		FORESEEN
3401.6584		104601	102019	69.2980	0.2850	3401.6584	3401.9434	BPMSX.4R2		0	0.009490	0	0.009920	0	0	0	0	0	IE			1	08.05.2013	INSTALLED
3401.9434	VACSEC.B1R2.X	271881	755730	69.5830	0.6450	3401.9434	3402.5884	VANGN.4R2.X		0	0.009920	0	0.010910	0	0	0	0	0	IE	X	VVFMT,VGPB,VPNCA,VVRDD,(RF transition with NEG) :: VPIA,VGPB,(RF transition with NEG)	1		FORESEEN

Ion Pumps

VPIB.220.1L2.X	53	0	0	0	Zone $5x10^{-11}$ mbar
	0	15	0	0	
	0	0	10	0	
	0	0	0	10	
VPIA.193.1L2.X	16	0	0	0	Zone $5x10^{-12}$ mbar
	0	28	0	0	
	0	0	12	0	
	0	0	0	12	
VPIA.89.1L2.X	16	0	0	0	Zone $1x10^{-12}$ mbar
	0	28	0	0	
	0	0	12	0	
	0	0	0	12	
VPIXB.45.1L2.X	10	0	0	0	Zone $5x10^{-12}$ mbar
	0	5	0	0	
	0	0	10	0	
	0	0	0	10	
VPIB.193.1R2.X	43	0	0	0	Zone $5x10^{-12}$ mbar
	0	15	0	0	
	0	0	7	0	
	0	0	0	7	
VPIB.220.1R2.X	53	0	0	0	Zone $5x10^{-11}$ mbar
	0	15	0	0	
	0	0	10	0	
	0	0	0	10	

Ion Pumps + NEG cartridge after LS1

VPIB.220.1L2.X

200	0	0	0
0	15	0	0
0	0	50	0
0	0	0	50

Zone 5×10^{-11} mbar

Values chosen (for the H2) to match the measured pressure

VPIB.220.1R2.X

200	0	0	0
0	15	0	0
0	0	50	0
0	0	0	50

Zone 5×10^{-11} mbar

ISD-ESD-PSD

VASCO PARAMETERS

	Parameters		NEG				Baked Copper				Cold				Cold			
%			H2	CH4	CO	CO2	H2	CH4	CO	CO2	H2	CH4	CO	CO2	H2	CH4	CO	CO2
in_Segment = [			1	0	0	0	3	0	0	0	2	0	0	0	4	0	0	0
in_d = [	[mm]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_L = [	[mm]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_dist_ref = [	[mm]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_T = [	[K]		300	0	0	0	300	0	0	0	15	0	0	0	10	0	0	0
in_S = [	Pumping Speed [L/s] of pump located at the left hand of the segment		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_g = [	Local source of gas [torrl/s]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_sigma = [	Ionization Cross Section		4.45E-23	0	0	0	4.45E-23	0	0	0	4.45E-23	0	0	0	4.45E-23	0	0	0
			0	3.18E-22	0	0	0	3.18E-22	0	0	0	3.18E-22	0	0	0	3.18E-22	0	0
			0	0	2.75E-22	0	0	0	2.75E-22	0	0	0	2.75E-22	0	0	0	2.75E-22	0
			0	0	0	4.29E-22	0	0	0	4.29E-22	0	0	0	4.29E-22	0	0	0	4.29E-22
in_alpha = [	Sticking coefficient for NEG		5.00E-03	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0
			0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0
			0	0	0.50	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0
			0	0	0	0.50	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12
in_alpha_p = [	Sticking coefficient for cryogenic surfaces		1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0
			0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0
			0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0
			0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12	0	0	0	1.00E-12
in_eta_i = [	Ion induced desorption on room temperature surface	H2	5.40E-02	5.40E-02	5.40E-02	5.40E-02	0.54	0.54	0.54	0.54	0	0	0	0	0	0	0	0
		CH4	4.00E-03	5.00E-03	7.00E-03	1.10E-02	0.04	0.05	0.07	0.11	0	0	0	0	0	0	0	0
		CO	2.50E-02	2.90E-02	2.90E-02	3.30E-02	0.25	0.29	0.29	0.33	0	0	0	0	0	0	0	0
		CO2	1.40E-02	1.40E-02	1.40E-02	1.40E-02	0.14	0.14	0.14	0.14	0	0	0	0	0	0	0	0
in_eta_p_i = [	Ion induced desorption on cryogenic surface	H2	0	0	0	0	0	0	0	0	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
		CH4	0	0	0	0	0	0	0	0	0.02	0.03	0.04	0.07	0.02	0.03	0.04	0.07
		CO	0	0	0	0	0	0	0	0	0.15	0.17	0.17	0.20	0.15	0.17	0.17	0.20
		CO2	0	0	0	0	0	0	0	0	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
in_eta_e = [	e- induced desorption on room temperature		3.30E-05	8.30E-07	1.70E-05	1.70E-05	1.80E-03	6.50E-05	4.50E-04	3.90E-04	0	0	0	0	0	0	0	0
in_eta_p_e = [	e- induced desorption on cryogenic surface		0	0	0	0	0	0	0	0	9.68E-03	8.72E-05	4.17E-04	9.68E-04	9.68E-03	8.72E-05	4.17E-04	9.68E-04
in_eta_ph = [	photon induced desorption on room temperature		2.50E-07	2.50E-09	1.20E-08	1.20E-08	1.50E-04	4.00E-06	1.50E-05	2.50E-05	0	0	0	0	0	0	0	0
in_eta_p_ph = [	photon induced desorption on cryogenic surface		0	0	0	0	0	0	0	0	1.98E-05	1.42E-06	5.67E-06	1.98E-05	1.98E-05	1.42E-06	5.67E-06	1.98E-05
in_Cbs = [	Linear pumping speed for beam screen		0	0	0	0	0	0	0	0	0	0	0	0	120	0	0	0
			0	0	0	0	0	0	0	0	0	42	0	0	0	42	0	0
			0	0	0	0	0	0	0	0	0	0	32	0	0	0	32	0
			0	0	0	0	0	0	0	0	0	0	0	26	0	0	0	26
in_Qth = [	Thermal Degassing [mbar L/s cm2]		5.00E-14	3.00E-17	1.00E-14	1.00E-14					0	0	0	0	0	0	0	0
in_n_e = [	Vapour pressure cryogenic temperature		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_N_e = [	Electron Flux [e/m/s]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_Gamma_ph = [	Photon Flux [ph/m/s]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_S_Nplus1 = [	Pumping Speed [L/s] of pump located at the right hand side of LAST segment		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
in_g_Nplus1 = [	Local source of gas of last segment [torrl/s]		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ISD-ESD-PSD

VASCO PARAMETERS

Stainless steel Vacuum fired				
	H2	CH4	CO	CO2
in_T = [	300	0	0	0
in_S = [	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
in_g = [	0	0	0	0
in_sigma = [	4.45E-23	0	0	0
	0	3.18E-22	0	0
	0	0	2.75E-22	0
	0	0	0	4.29E-22
in_alpha = [	1.00E-12	0	0	0
	0	1.00E-12	0	0
	0	0	1.00E-12	0
	0	0	0	1.00E-12
in_alpha_p = [	1.00E-12	0	0	0
	0	1.00E-12	0	0
	0	0	1.00E-12	0
	0	0	0	1.00E-12
in_eta_i = [	5.42E-01	5.42E-01	5.42E-01	5.42E-01
	3.61E-02	5.42E-02	7.22E-02	1.08E-01
	2.53E-01	2.89E-01	2.89E-01	3.25E-01
	1.44E-01	1.44E-01	1.44E-01	1.44E-01
in_eta_p_i = [	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
in_eta_e = [	1.80E-03	6.50E-05	4.50E-04	3.90E-04
in_eta_p_e = [	0	0	0	0
in_eta_ph = [	1.50E-04	4.00E-06	1.50E-05	2.50E-05
in_eta_p_ph = [	0	0	0	0
in_Cbs = [	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
in_Qth = [	1.00E-12	5.00E-15	1.00E-14	5.00E-15
in_n_e = [	0	0	0	0
in_N_e = [	0.00E+00	0.00E+00	0.00E+00	0.00E+00
in_Gamma_ph = [	0	0	0	0
in_S_Nplus1 = [	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
in_g_Nplus1 = [	0	0	0	0

Degassing

2009

		VAX2A.1L2.X + VMABA.1L2.X			
in_Qth = [		3.00E-11	1.00E-14	5.00E-14	5.00E-14

		VAX2B.1R2.X			
in_Qth = [		3.00E-11	1.00E-14	5.00E-14	5.00E-14

After 2 bakeout

2015 - after LS2

		VAX2A.1L2.X + VMABA.1L2.X			
in_Qth = [		5.00E-12	1.00E-14	5.00E-14	5.00E-14

		VAX2B.1R2.X			
in_Qth = [		5.00E-12	1.00E-14	5.00E-14	5.00E-14

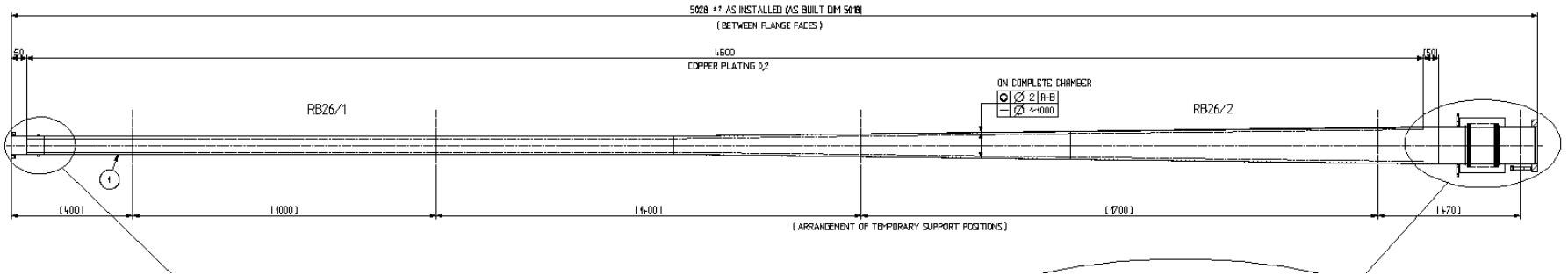
Values chosen (for the H2) to match the measured pressure, combined with the NEG cartridge pumping speed

Calculation

ALICE RB26 layout for VASCO

Conical chamber VASCO dimensions scaled with surface

RB26/1-2



l=2228

l=2120

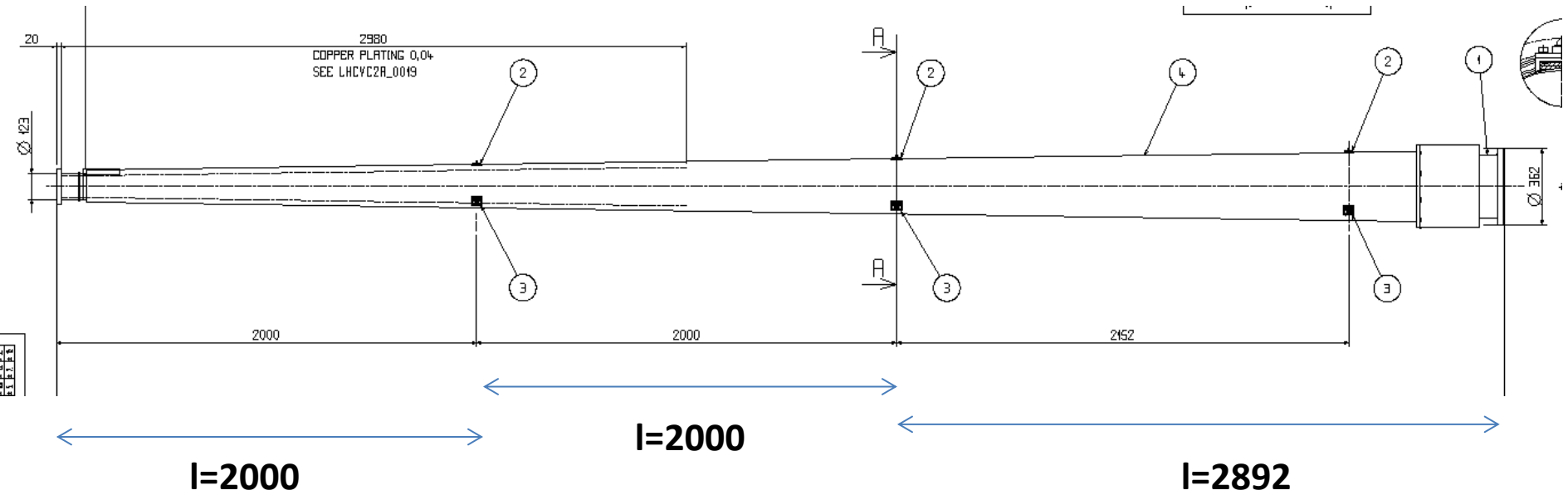
after LS1

(shorter due to longer IP chamber)

Real		
d (mm)	**l (mm)**	**S (mm2)**
58.4	2120	388954.30
VASCO		

Real			
d1 (mm)	**d2 (mm)**	**l (mm)**	**S (mm2)**
58.4	120	2228	1249182.344
VASCO			
178.47	X	2228	

RB26/3



l=2000

l=2000

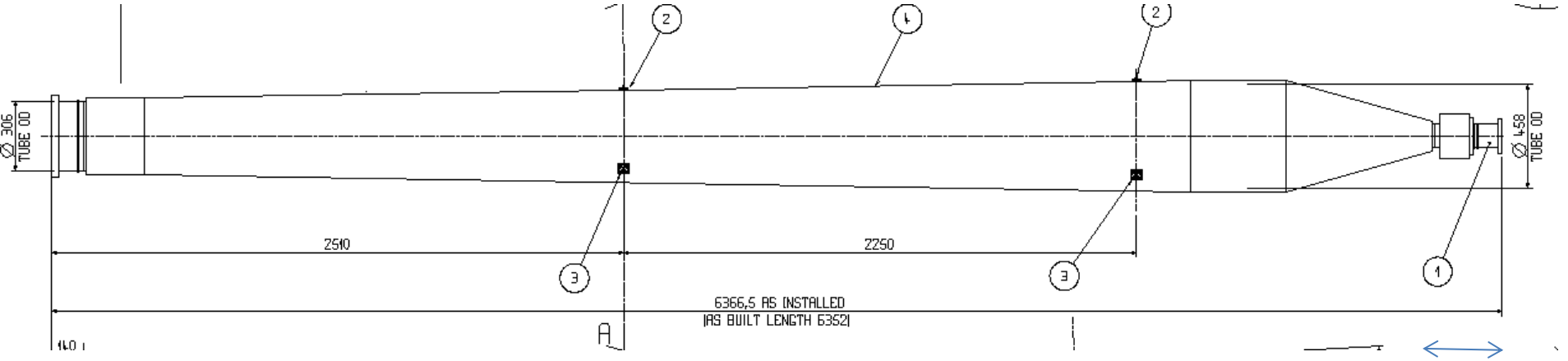
l=2892

Real			
d1 (mm)	d2 (mm)	l (mm)	S (mm2)
120	170	2000	1822693.064
VASCO			
290	X	2000	

Real			
d1 (mm)	d2 (mm)	l (mm)	S (mm2)
170	233	2000	2533379.617
403	X	2000	

Real			
d1 (mm)	d2 (mm)	l (mm)	S (mm2)
233	300	2892	4843863.41
VASCO			
533	X	2892	

RB26/4



Real			
d1 (mm)	d2 (mm)	l (mm)	S (mm2)
300	432	2510	5780087.38
VASCO			
636.2	X	2510	

Real			
d1 (mm)	d2 (mm)	l (mm)	S (mm2)
432	450	2906	8052345.46
886.3	X	2906	

Real			
d1 (mm)	d2 (mm)	l (mm)	S (mm2)
450	100	654	1281678.71
VASCO			
141	X	654	

Some Results

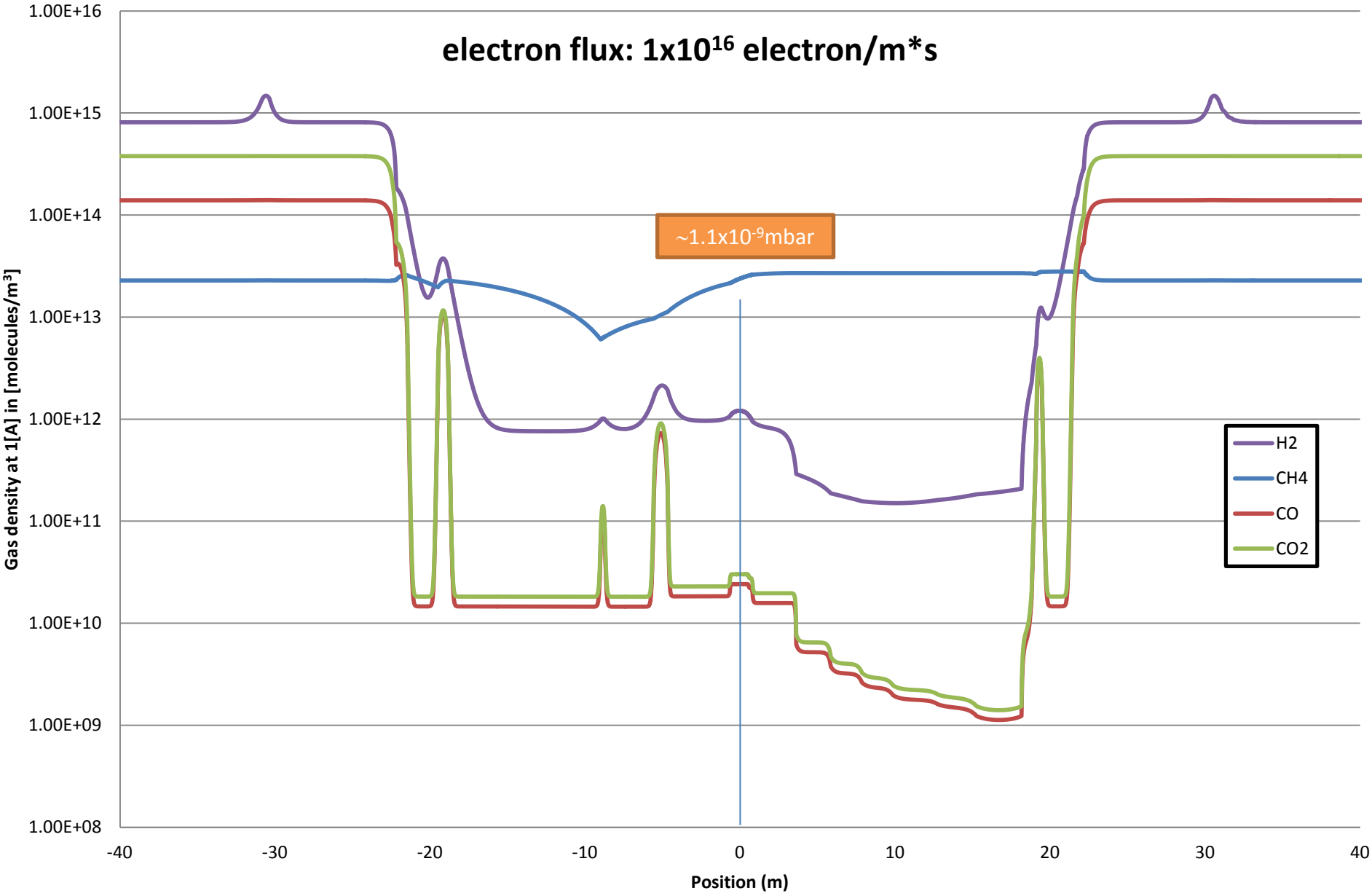
Dynamic vacuum

Vacuum Stability

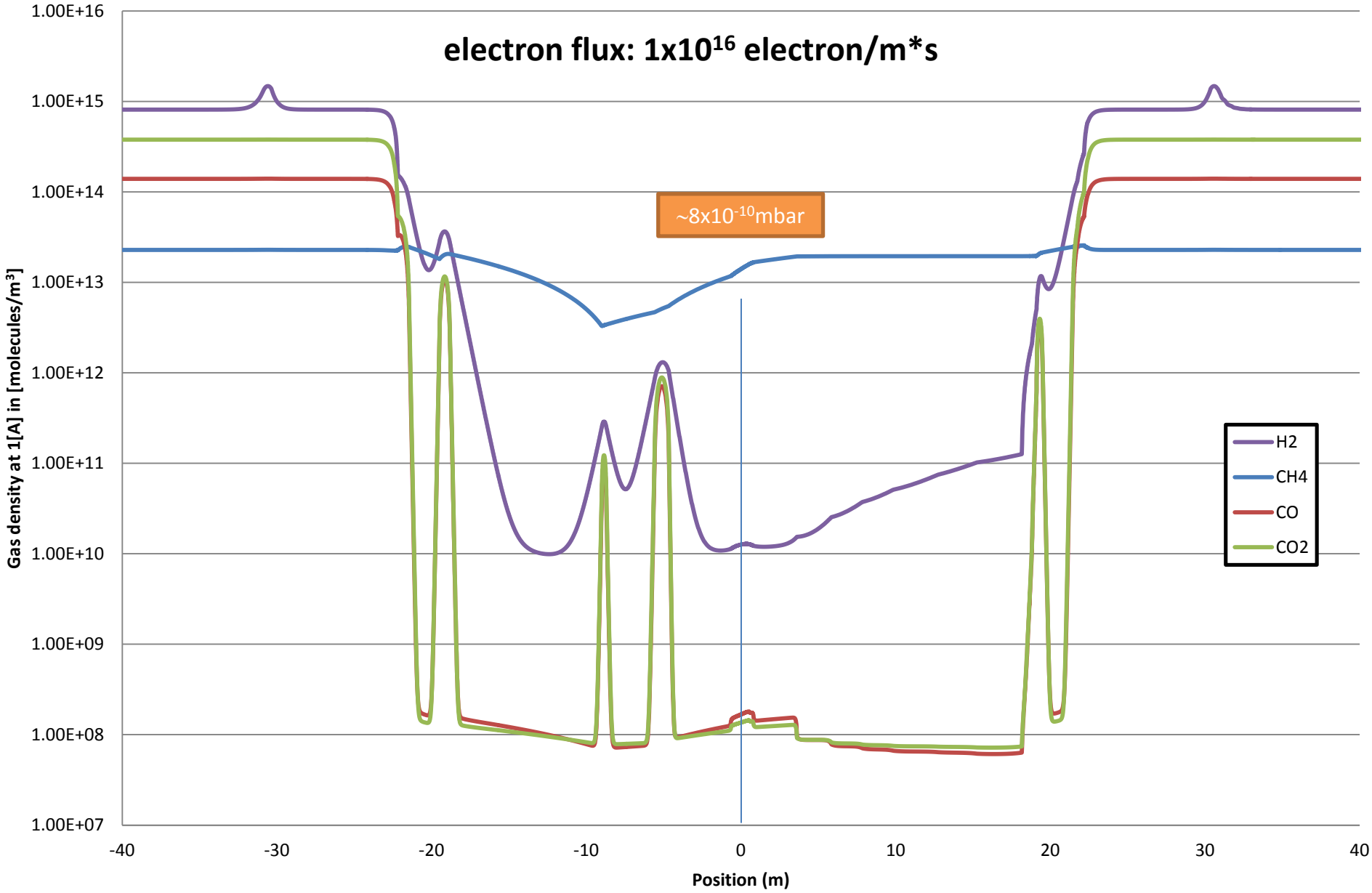
	NEG Fully Activated and Ion Pumps as table below						NEG 90% saturated	NEG 90% saturated And all Ion Pumps off
Critical Current [A]	45	45	45	45	45	20	45	20

	Pumping speed (l/s)								
Ion Pump	**H2**	**CH_4**	**CO**	**CO_2**	**Status**				
VPIB.220.1L2.X	30	20	20	20	OFF	ON	ON	ON	OFF
VPIA.193.1L2.X	50	30	20	20	ON	OFF	ON	ON	OFF
VPIA.89.1L2.X	50	30	20	20	ON	ON	OFF	ON	OFF
VPIXB.45.1L2.X	10	5	10	5	ON	ON	ON	OFF	OFF
VPIB.193.1R2.X	30	30	20	20	ON	OFF	ON	ON	OFF
VPIB.220.1R2.X	30	20	20	20	OFF	ON	ON	ON	OFF

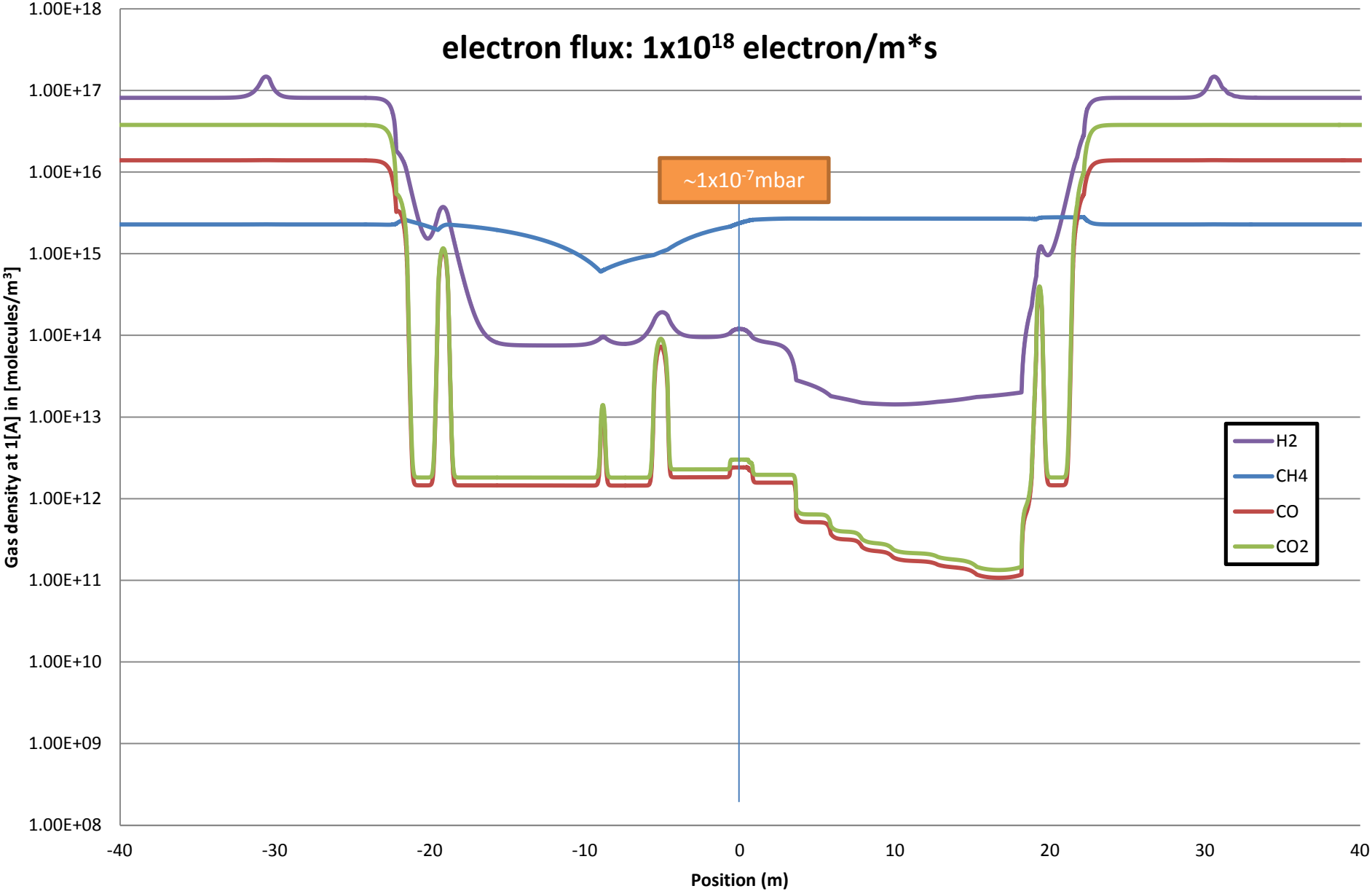
Dynamic Vacuum: e^- flux on NEG



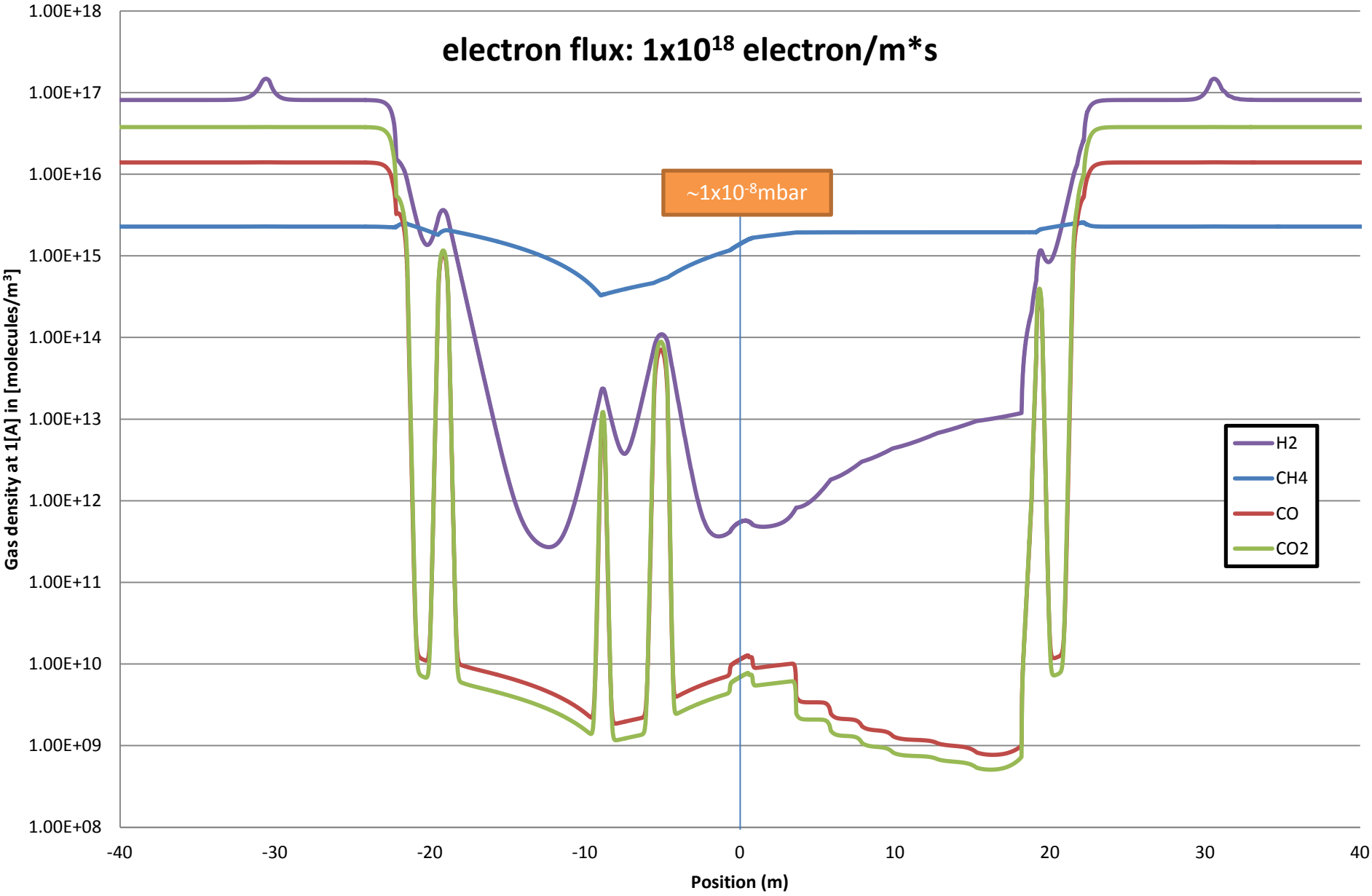
Dynamic Vacuum: NO e^- flux on NEG



Dynamic Vacuum: e^- flux on NEG



Dynamic Vacuum: NO e^- flux on NEG



Dynamic Vacuum at IP: NO e^- flux on NEG

electron cloud