Date	13 November 2018
Time	11:49:24
Test Number	HRSG Test 22
Mixture Composition	60/40 H2/CH4
Ambient Temperature	11 °C
Ambient Pressure	978
Wind Speed	3 m/s
Wind direction	NW
Relative Humidity	80.00%
Mass Flow	kg/s
Equivalence Ratio	0.50

General Comments: (weather, rig configuration)

Weather: Sunny and autumnal. Cold and crisp, light wind.

Rig configuration: 4 x 3m circular duct; expansion section and HRSG attached. End Plate attached. Igniter 258mm from beginning of 2nd circular duct section

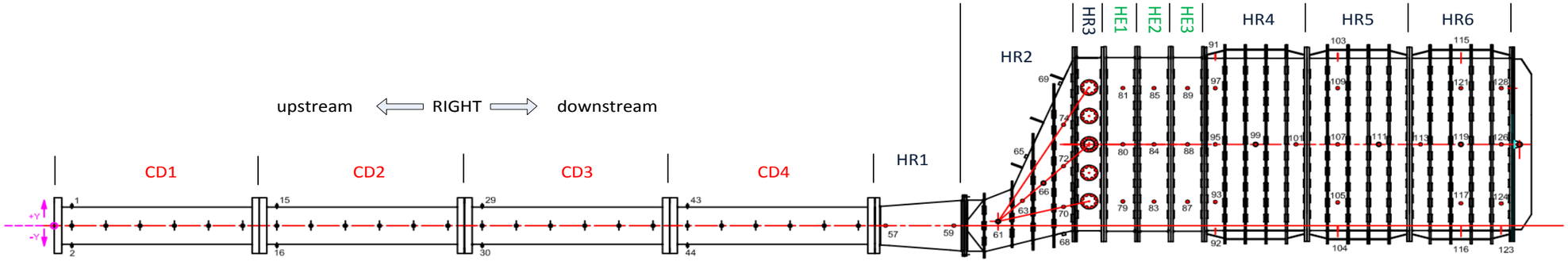
Engine Speed: 40%; 11,800 rpm

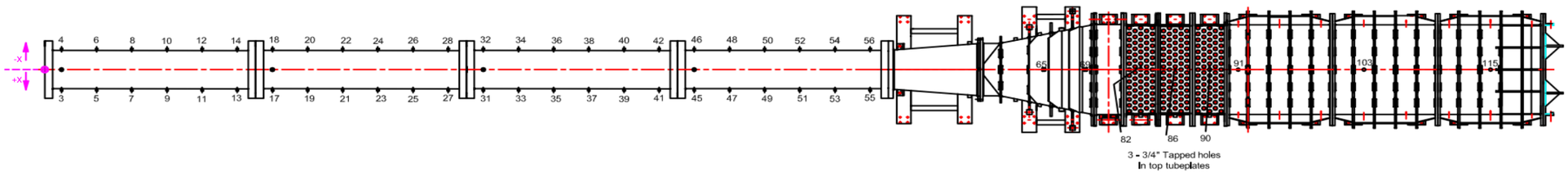
Test on 60% H2 40% H2 at an intended EQR of 0.40

The test gave a very weak combustion event but flame detection devices mostly provided an identifiable response ahead of the heat exchanger. Flame speeds from each sensor type correlated well.

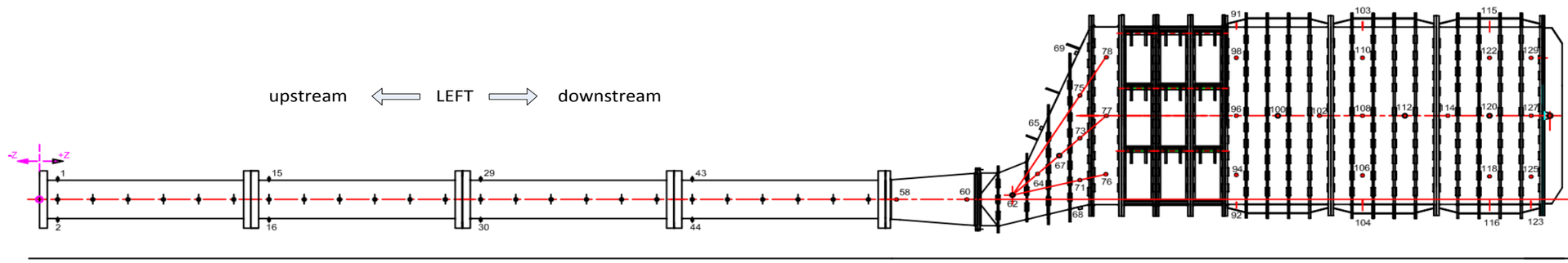
Maximum (approximate) overpressure of 20 mbar was seen on KU0 in the duct.

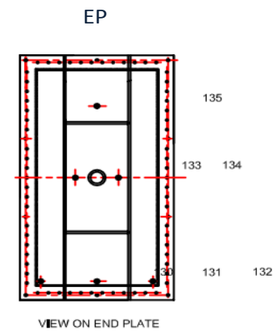
						Ionisation Probes			Ionisation Rakes			Optical Probes			
Max overpressure	20	mbar	Max. gas temperature	656	°C	Max. flame speed	99	m/s	Max. flame speed	102	m/s	Max. flame speed	104	m/s	
			Initial gas temperature	360	°C										
	Location of Max. Overpressure			Location of Max. Temperature			Location of Max. Flame Speed			Location of Max. Flame Speed			Location of Max. Flame Speed		
sensor	KU0		sensor	TC19		sensor	IP0		sensor	RA1		sensor	OP2		
label	CD3-R5		label	HR3-L1M		label	CD4-L6		label	HR2-R2M		label	HR1-R1		
distance	8258	mm	distance	15140	mm	distance	11758	mm	distance	13785	mm	ance	12152	mm	





3 - 3/4" Tapped holes
In top tubeplates





INSTRUMENT PORTS

76 - INSTRUMENT PORTS IN ST ST 40mm HIGH
TAPPED THROUGH (50 - 3/4" BSPP, 15 - 1" BSPP & 11 - 11/4" BSPP)
HOLES THROUGH PLATE WILL BE 19mm & 25MM)
ON EACH HEAT EXCHANGER THERE IS 1 - 3/4" TAPPED HOLE
IN THE TOP TUBEPLATE

SECTION 1:	2 - 3/4" ON EACH SIDE OF SECTION 1
SECTION 2:	2 - 1" ON TOP, 1 - 1" ON BASE, 2 - 11/4" ON EACH SIDE, 4 - 3/4" ON EACH SIDE
SECTION 3:	1 - 11/4" ON CENTRE & 2 - 3/4" ALL ON REAR SIDE
HEAT EXCHANGERS:	3 - 3/4" ON ONE SIDE & 1 - 3/4" BSPP TAPPED HOLE IN TOP TUBEPLATE
SECTION 4:	1 - 1" ON TOP, 1 - 1" ON BASE, 1 - 11/4" ON CENTRE OF EACH SIDE, 4 - 3/4" ON EACH SIDE
SECTION 5:	1 - 1" ON TOP, 1 - 1" ON BASE, 1 - 11/4" ON EACH SIDE 3 - 3/4" ON EACH SIDE
SECTION 6:	1 - 1" ON TOP, 2 - 1" ON BASE, 1 - 11/4" ON EACH SIDE 6 - 3/4" ON EACH SIDE
END PLATE:	1 - 1" & 1 - 3/4" ON VERTICAL CENTRELINE 2 - 1" ON HORIZONTAL CENTRELINE 2 - 1" ON LOWER CORNERS (50mm in from corners)

Naming Convention

Section Identifier
i.e. HE, HR, CD or EP

Section Number (1-6)
Numbered from downstream to upstream

H R 1 - R 1 U

Side
i.e. R, L, T or B

Vertical position in section (sides only) i.e. U, M or L.
Absence of letter denotes centreline

Longitudinal position in section (numbered from 1)

Key

CD	Circular duct	**U**	Upper
HR	HRSG	**M**	Middle
HE	Heat Exchanger	**L**	Lower
EP	End Plate	**R**	Right Side (when viewed downstream from engine)
		L	Left Side
		T	Top
		B	Bottom

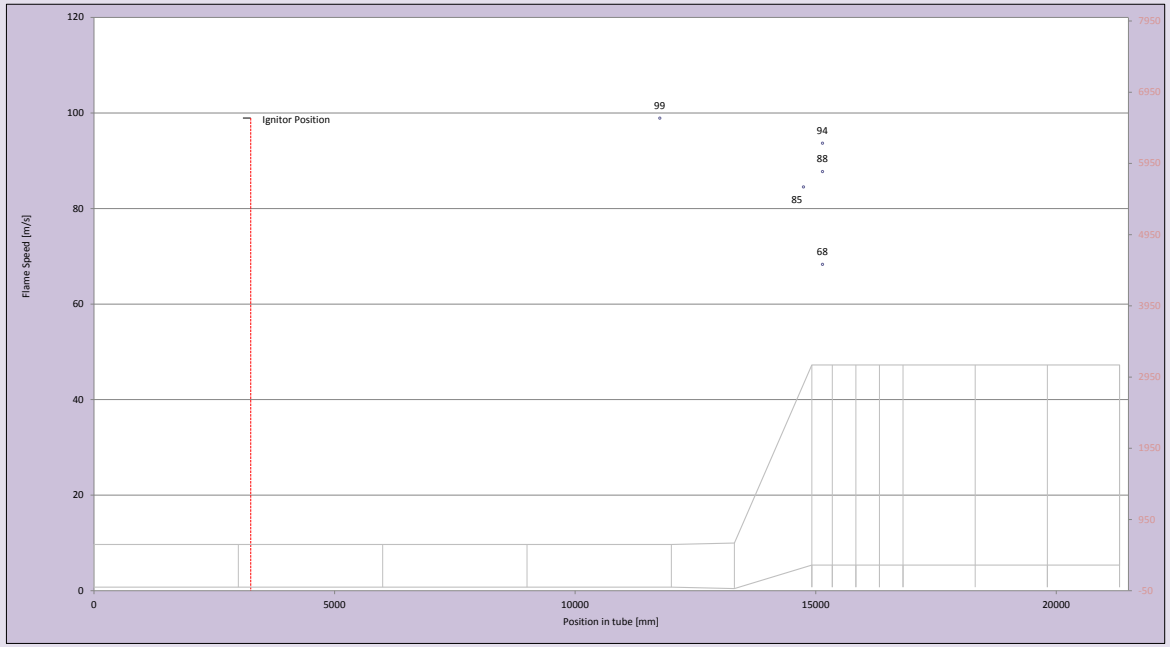
There are 13 sections on the rig

4	circular duct sections	(CD1 to CD4)
6	HRSG sections	(HR1 to HR6)
3	heat exchanger sections *located between HR3 and HR4*	(HE1 to HE3)

Location of igniter 3258 mm **Time of ignition** 13.57095 seconds

IP Number	Location label	Data Name	Position in tube (mm)	Flame arrival time (s)	Avg Flame speed from last sensor (m/s)
IP0	CD4-L6	sation probe 0	11758	13.65686	99
IP1	HR2-L5L	sation probe 1	14745	13.70682	85
IP2	HR2-L5M	sation probe 2	14745		
IP3	HR2-L5U	sation probe 3	14745		
IP4	HR3-R1L	sation probe 4	15140	13.69775	94
IP5	HR3-R1LM	sation probe 5	15140	13.70632	88
IP6	HR3-R1M	sation probe 6	15140		
IP7	HR3-R1U	sation probe 7	15140		
IP8	HR3-L1U	sation probe 8	15140	13.74484	68
IP9	HE2-R1M	sation probe 9	16090	ND	
IP10	HR4-L1L	ation probe 10	16985	ND	
IP11	HR4-L1M	ation probe 11	16985	ND	
IP12	HR4-L1U	ation probe 12	16985	ND	
IP13	HR4-R1U	ation probe 13	16985	ND	
IP14	HR4-R3U	ation probe 14	17575	ND	
IP15	HR4-L5L	ation probe 15	18165	ND	
IP16	HR4-L5M	ation probe 16	18165	ND	
IP17	HR4-L5U	ation probe 17	18165	ND	
IP18	HR4-R5M	ation probe 18	18165	ND	
IP19	HR5-L2L	ation probe 19	18775	ND	
IP20	HR5-L2M	ation probe 20	18775	ND	
IP21	HR5-L2U	ation probe 21	18775	ND	
IP22	HR5-R2U	ation probe 22	18775	ND	
IP23	HR6-L1M	ation probe 23	19985	ND	

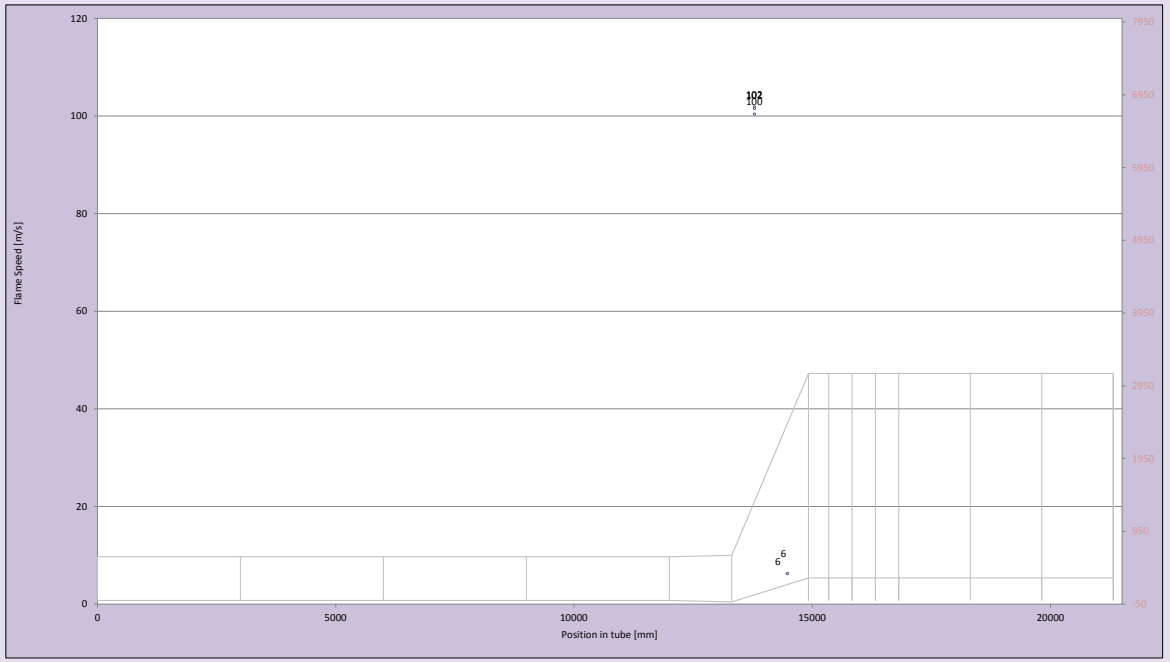
KEY: ND - not detected - sensor working but flame too weak to be picked up
NW - not working - sensor not working



Location of igniter 3258 mm **Time of ignition** 13.57095 seconds

Rake Number	IP Number	Location label	Data Name	Position in tube (mm)	Flame arrival time (s)	Avg Flame speed from last sensor (m/s)
RA1	IP24	HR2-R2M	IP24	13785	13.6743	102
RA1	IP25	HR2-R2M	IP25	13785	13.6746	102
RA1	IP26	HR2-R2M	IP26	13785	13.6758	100
RA2	IP27	HR2-R4M	IP27	14475	ND	
RA2	IP28	HR2-R4M	IP28	14475	13.7845	6
RA2	IP29	HR2-R4M	IP29	14475	13.7855	6
RA3	IP30	HR4-R3M	IP30	17575	ND	
RA3	IP31	HR4-R3M	IP31	17575	ND	
RA3	IP32	HR4-R3M	IP32	17575	ND	
RA4	IP33	HR4-R3L	IP33	17575	ND	
RA4	IP34	HR4-R3L	IP34	17575	ND	
RA4	IP35	HR4-R3L	IP35	17575	ND	

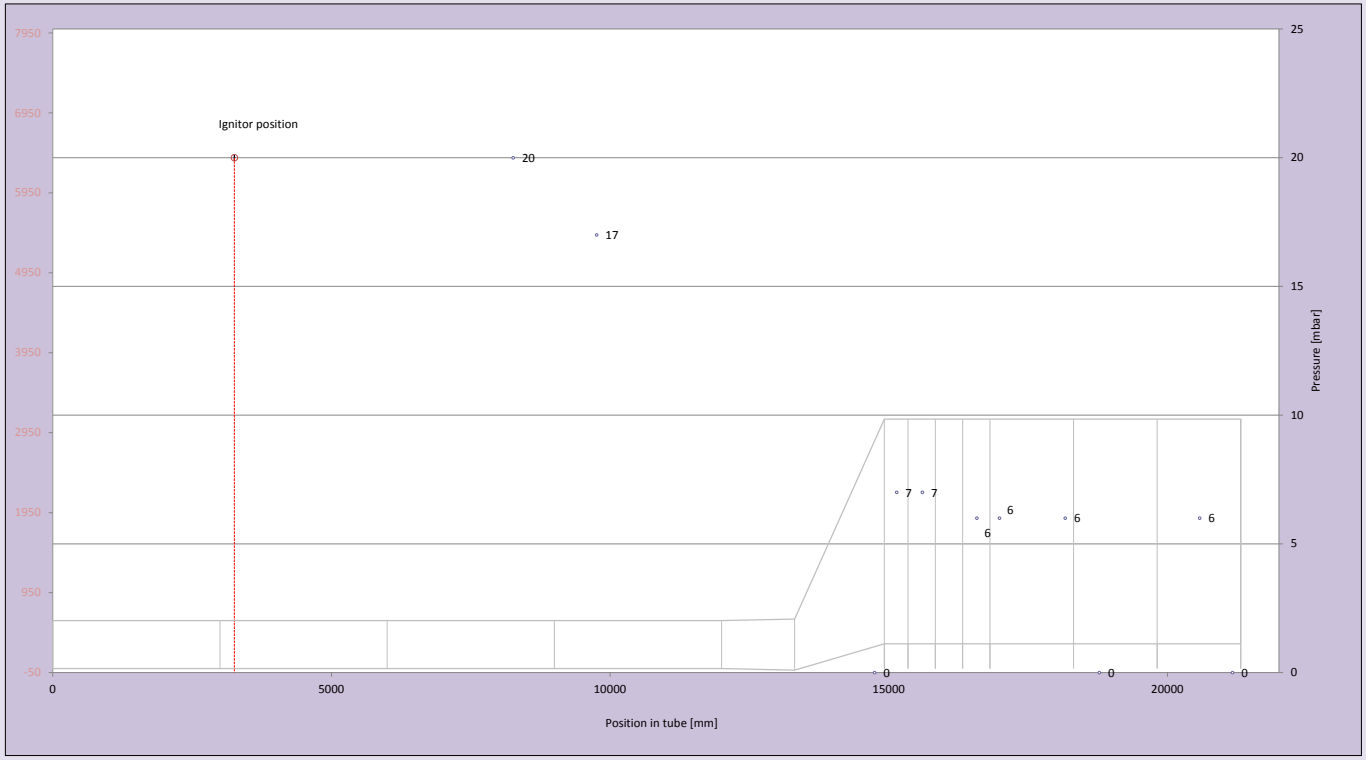
KEY: ND - not detected - sensor working but flame too weak to be picked up
NW - not working - sensor not working
The signal on IP 30 was noisey - some evidence of response to flame but not possible to pick out exact time of flame arrival



Location of igniter 3258 mm

Transducer number	Location	Position in tube [mm]	D_{Pmax} [mbar]	TimeD_{Pmax} [sec]
KU0	CD3-R5	8258	20	13.6196
KU1	CD4-R2	9758	17	13.6269
KU2	HR2-T5	14745	ND	
KU3	HR3-L1L	15140	7	13.6536
KU4	HE1-R1U	15600	7	13.6562
KU5	HE3-R1L	16580	6	13.6589
KU6	HR4-R1L	16985	6	13.6518
KU7	HR4-R5U	18165	6	13.5657
KU8	HR5-R2L	18775	ND	
KU9	HR6-R3L	20575	6	13.5657
KU10	HR6-L5L	21165	ND	

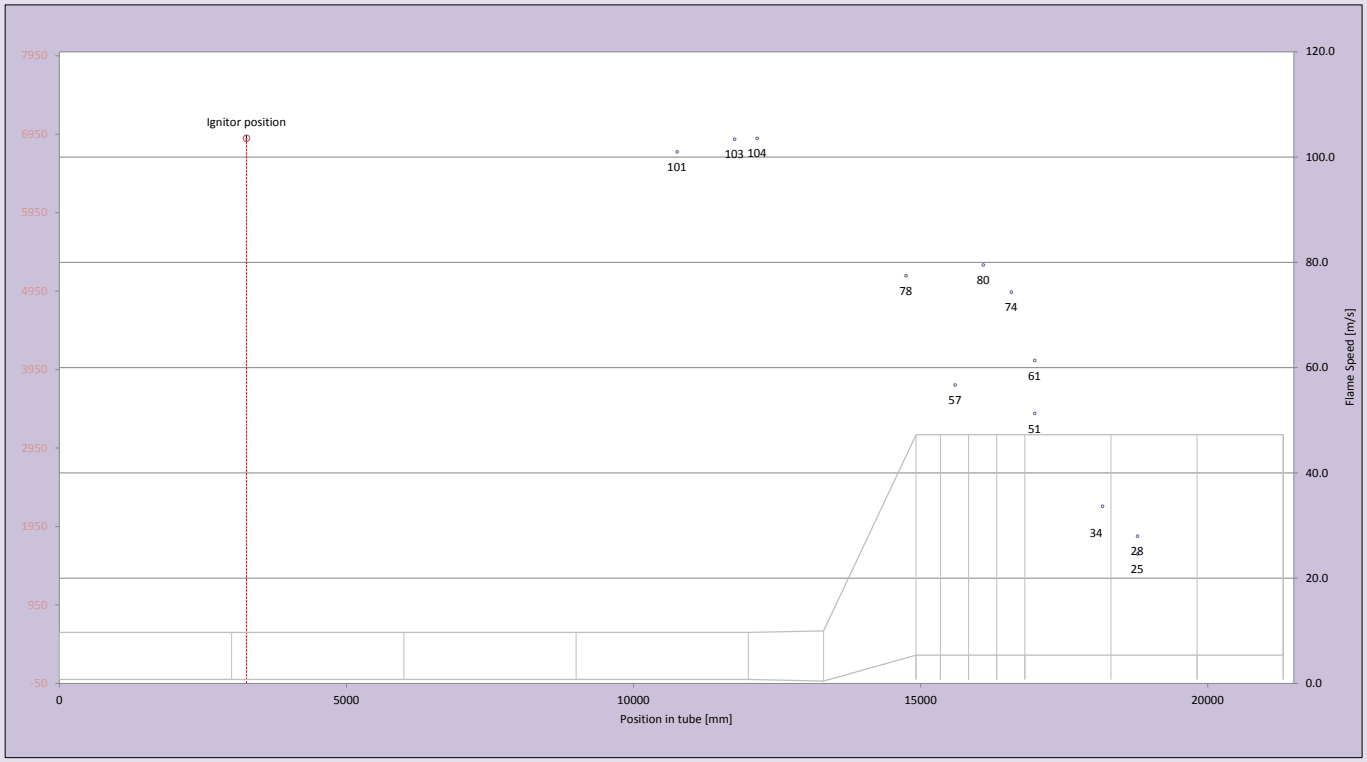
Very low pressure event. Pressure readings mostly less than noise levels in sensors. With 1000 point smoothing peak pressures can be approximated along with time of arrival.



Location of igniter 3258 mm **Time of ignitio** 13.57095 seconds

OP Number	Location label	Position in tube (mm)	Flame arrival time (s)	Average flame speed (m/s)
OP0	CD4-L4	10758	13.6452	101.0
OP1	CD4-R6	11758	13.6531	103.4
OP2	HR1-R1	12152	13.6568	103.6
OP3	HR2-R5M	14745	13.7192	77.5
OP4	HE1-T1	15600	13.7885	56.7
OP5	HE2-T1	16090	13.7323	79.5
OP6	HE3-T1	16580	13.7501	74.4
OP7	HR4-T1	16985	13.7945	61.4
OP8	HR4-R1M	16985	13.8384	51.3
OP9	HR4-R5L	18165	14.0132	33.7
OP10	HR5-T2	18775	14.1251	28.0
OP11	HR5-R2M	18775	14.2012	24.6

KEY: ND - not detected - sensor working but flame too weak to be picked up
NW - not working - sensor not working

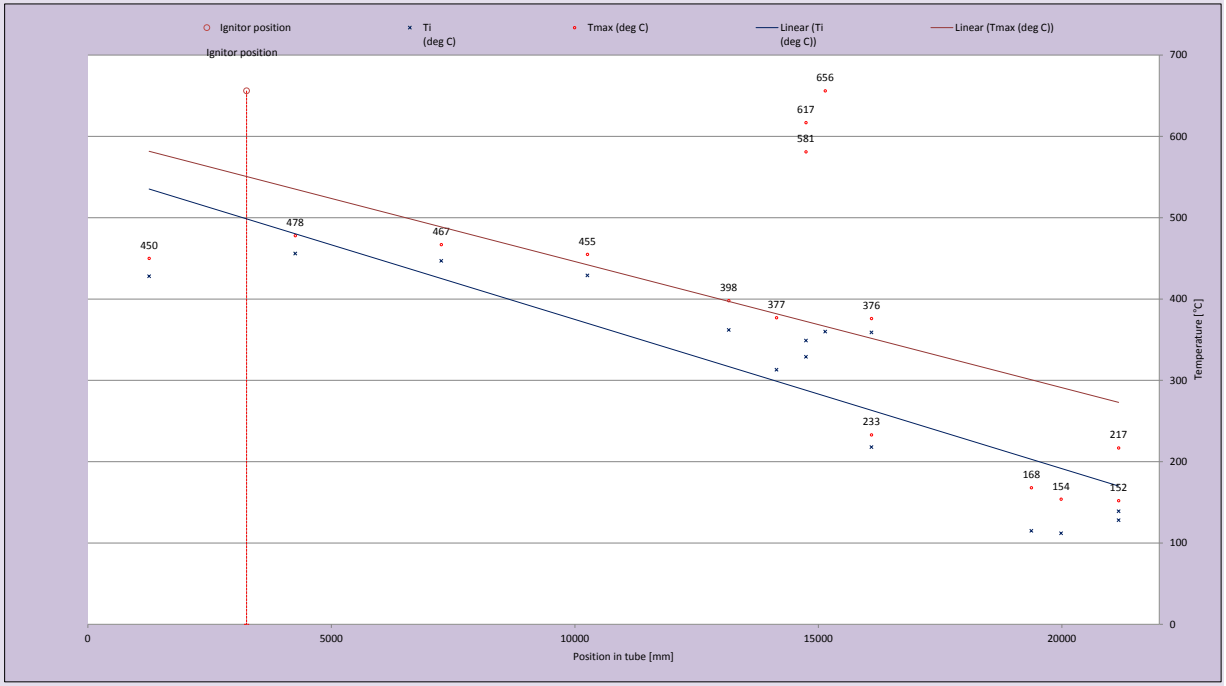


Location of igniter 3258 mm **Time of ignition** 13.57095 seconds

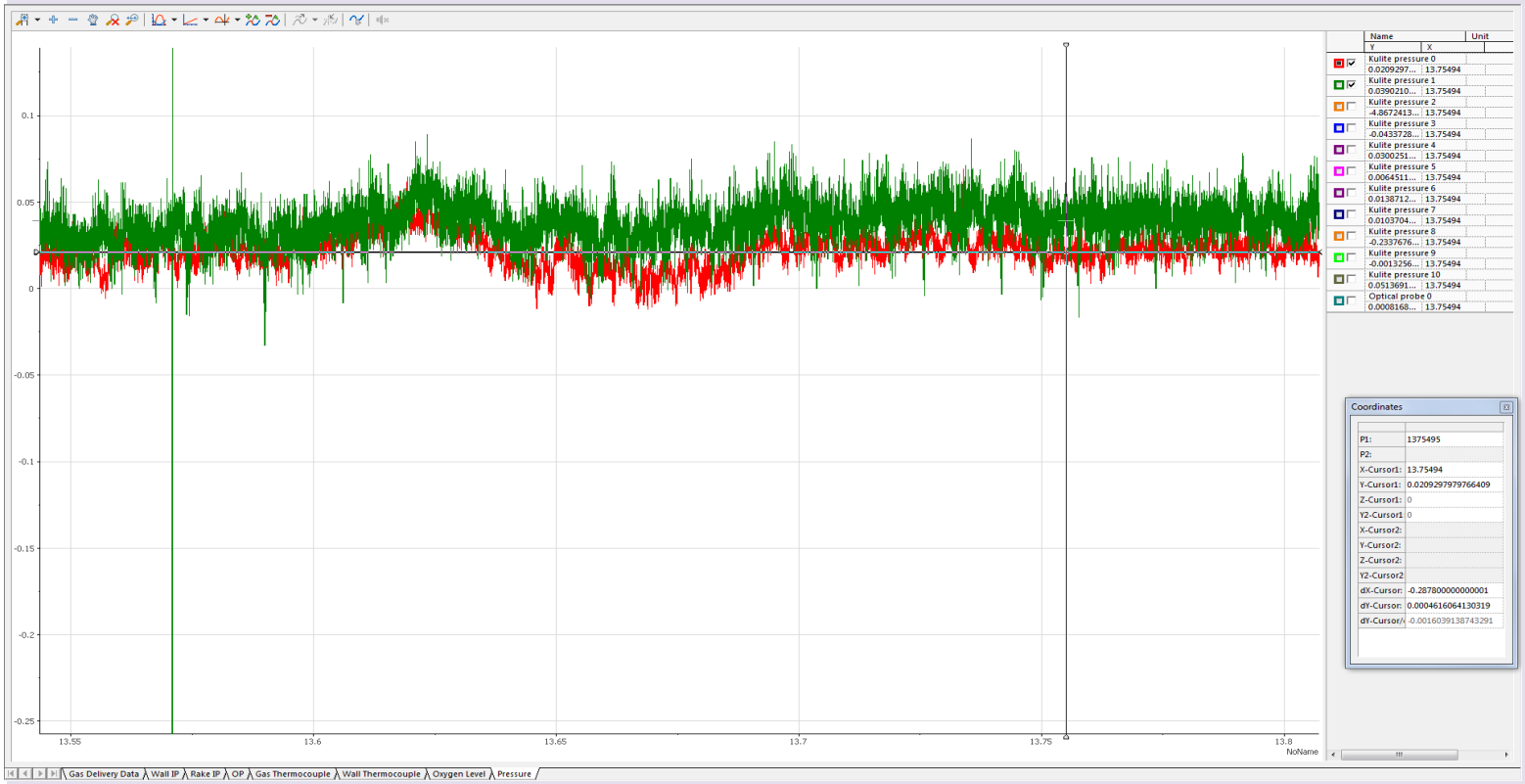
Thermocouple number	Location	Position in tube (mm)	Flame arrival time (s)	Average flame speed (m/s)	T_{max} (deg C)	T_i (deg C)
TC0	CD1-R3	1258			450	428
TC2	CD2-R3	4258			478	456
TC4	CD3-R3	7258			467	447
TC6	CD4-R3	10258	13.723		455	429
TC8	HR1-R2	13160	13.756		398	362
TC16	HR2-R3M	14140	13.789		377	313
TC17	HR2-R5L	14745	13.790		617	349
TC18	HR2-R5U	14745	13.804		581	329
TC19	HR3-L1M	15140	13.849		656	360
TC20	HE2-R1L	16090			376	359
TC21	HE2-R1U	16090			233	218
TC22	HR5-R4M	19375			168	115
TC23	HR6-R1M	19985			154	112
TC24	HR6-R5L	21165			152	128
TC25	HR6-R5U	21165			217	139

surface thermocouples [not plotted]

TC1	CD1-T2	1508			98	87
TC3	CD2-T2	4508			75	66
TC5	CD3-T2	7508			73	64
TC7	CD4-T2	10508			52	47



Pressure


Name
Unit
Y
X
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0.0209297... 13.75494
Kulite pressure 1
0.0390210... 13.75494
Kulite pressure 2
-4.8672413... 13.75494
Kulite pressure 3
-0.0433728... 13.75494
Kulite pressure 4
0.0300251... 13.75494
Kulite pressure 5
0.0064511... 13.75494
Kulite pressure 6
0.0138712... 13.75494
Kulite pressure 7
0.0103704... 13.75494
Kulite pressure 8
-0.2337676... 13.75494
Kulite pressure 9
-0.0013256... 13.75494
Kulite pressure 10
0.0513691... 13.75494
Optical probe 0
0.0008168... 13.75494
Coordinates
P1: 1375495
P2:
X-Cursor1: 13.75494
Y-Cursor1: 0.0209297979766409
Z-Cursor1: 0
Y2-Cursor1 0
X-Cursor2:
Y-Cursor2:
Z-Cursor2:
Y2-Cursor2
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dY-Cursor: 0.0004616064130319
dY-Cursor/ -0.0016039138743291
0.1
0.05
0
-0.05
-0.1
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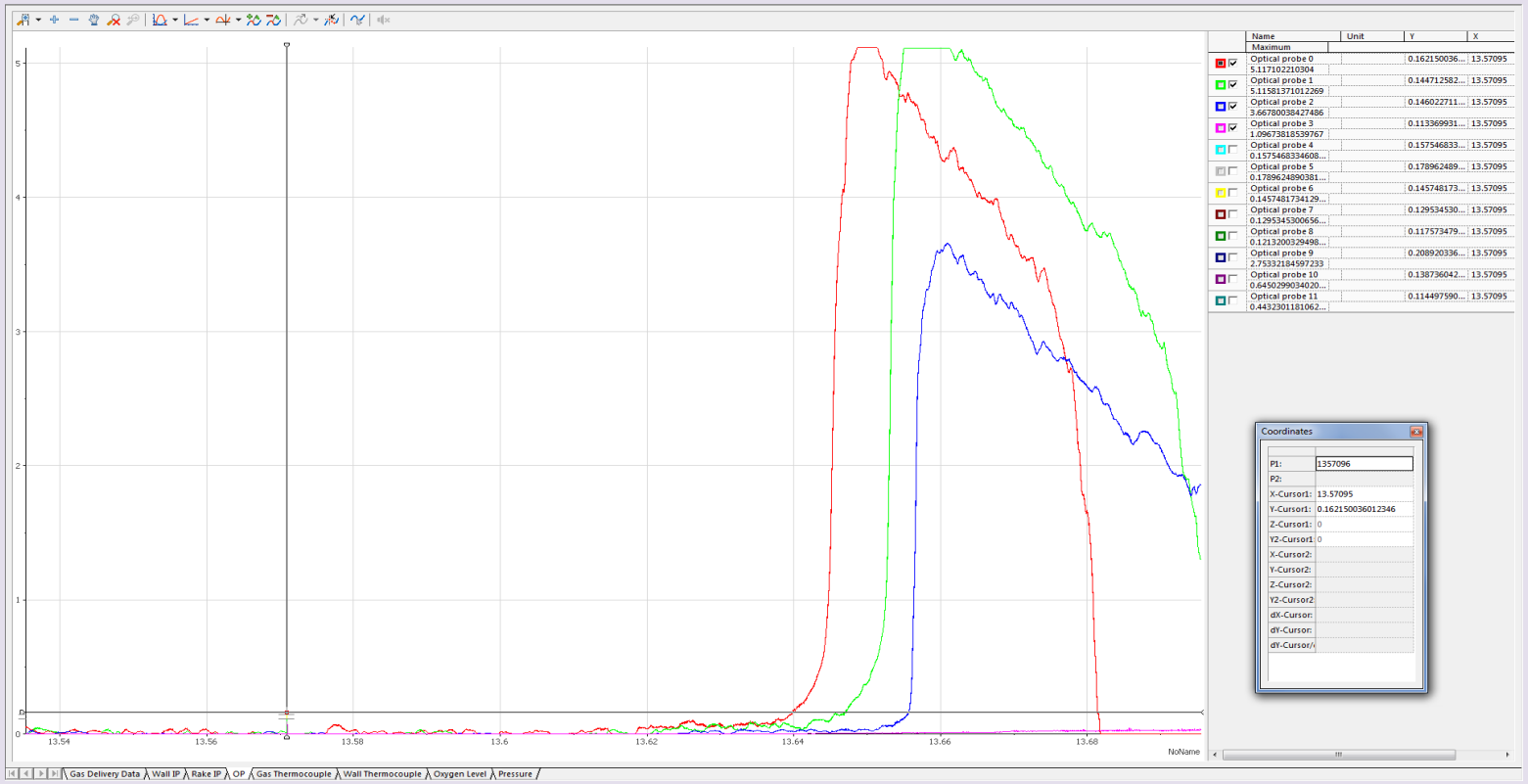
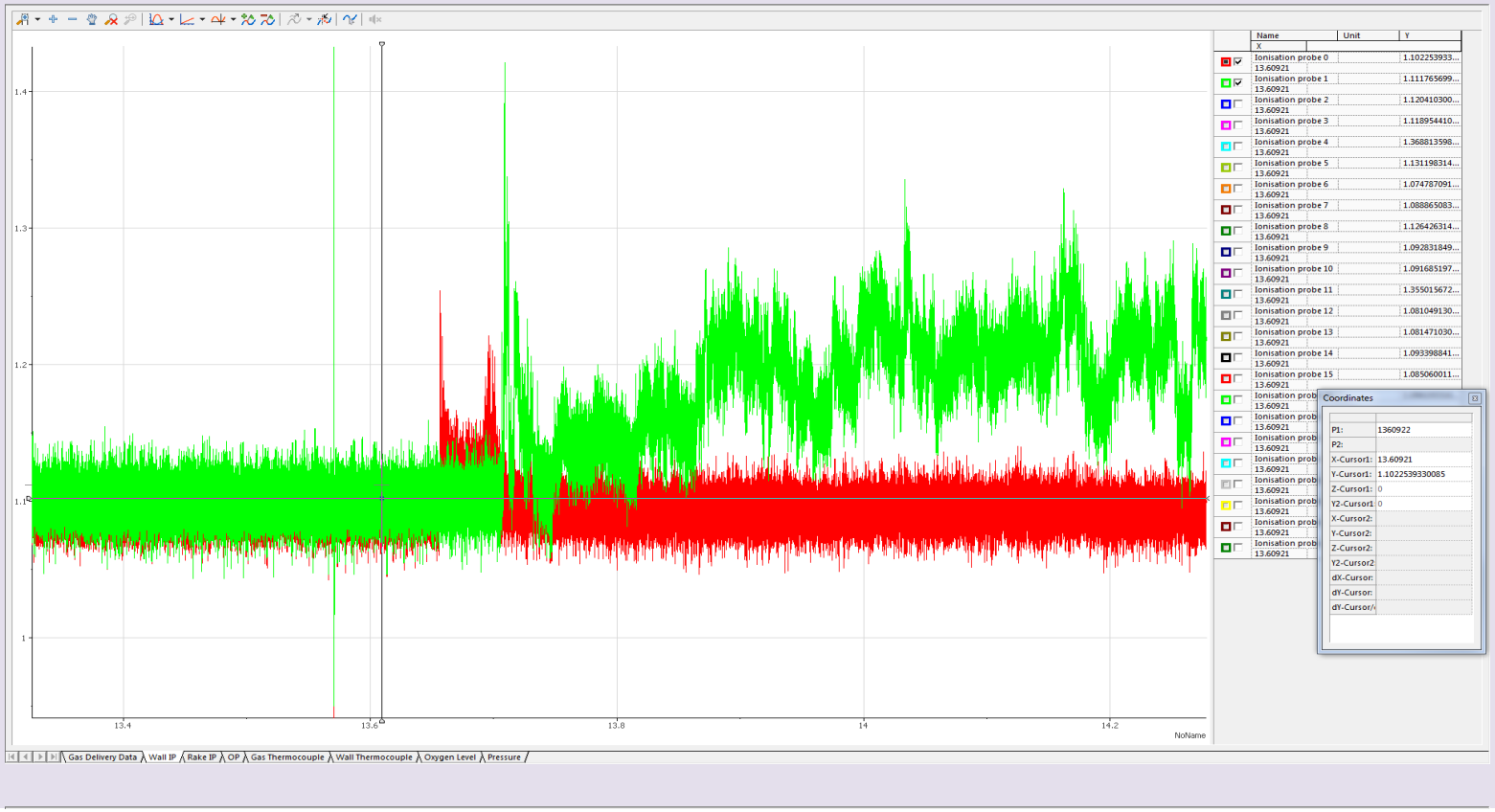
-0.25
13.55
13.6
13.65
13.7
13.75
13.8
NoName
Gas Delivery Data
Wall IP
Rake IP
OP
Gas Thermocouple
Wall Thermocouple
Oxygen Level
Pressure

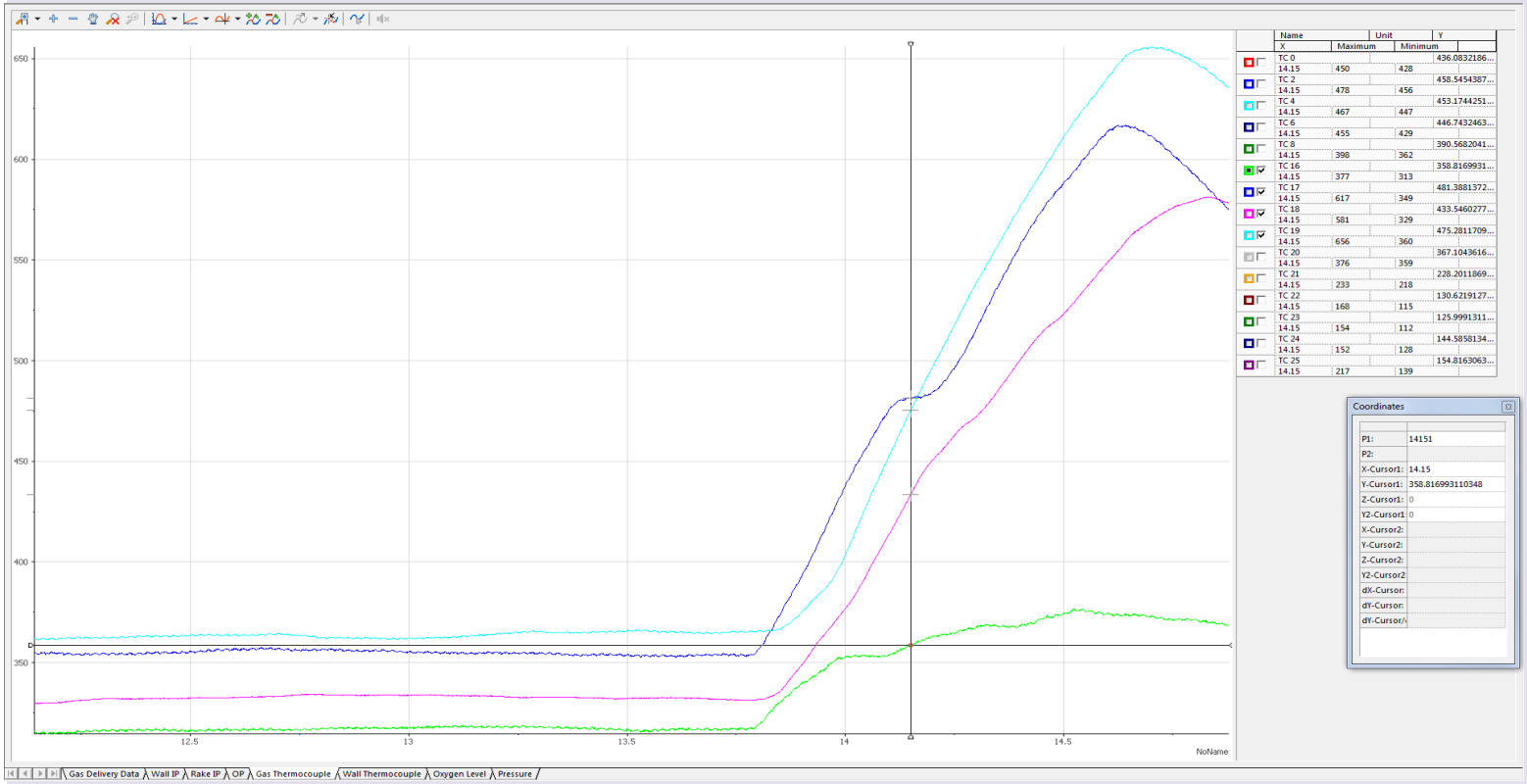
Optical Probes



Ionisation Probes



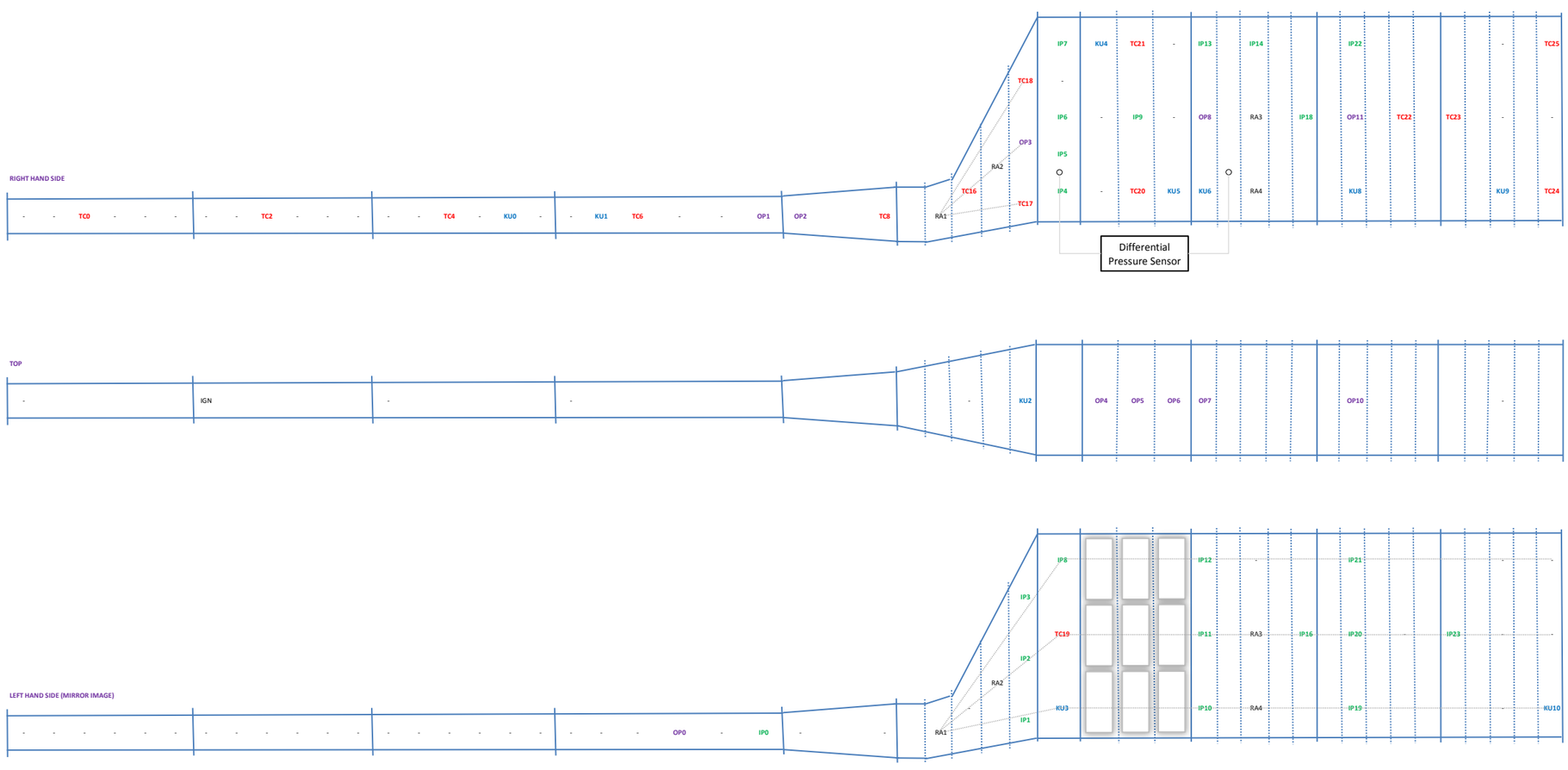
Temperature



Sensor	OLD DESIGNATION	NEW DESIGNATION	Section	Section Number	Side	Horizontal Location	Vertical Location	PORT REF	SIZE	"X"	"Y"	"Z"
-		CD1-T1	CD	1	T	1		1	1" BSPP	0	298	258
TC1	TS1-1	CD1-T2	CD	1	T	2		NA	SURFACE	0	298	1508
-		CD1-B1	CD	1	B	1		2	1" BSPP	0	-298	258
-	NS1-1	CD1-R1	CD	1	R	1		3	3/4" BSPP	298	0	258
-	FS1-1	CD1-L1	CD	1	L	1		4	3/4" BSPP	-298	0	258
-	NS1-2	CD1-R2	CD	1	R	2		5	3/4" BSPP	298	0	758
-	FS1-2	CD1-L2	CD	1	L	2		6	3/4" BSPP	-298	0	758
TC0	NS1-3	CD1-R3	CD	1	R	3		7	3/4" BSPP	298	0	1258
-	FS1-3	CD1-L3	CD	1	L	3		8	3/4" BSPP	-298	0	1258
-	NS1-4	CD1-R4	CD	1	R	4		9	3/4" BSPP	298	0	1758
-	FS1-4	CD1-L4	CD	1	L	4		10	3/4" BSPP	-298	0	1758
-	NS1-5	CD1-R5	CD	1	R	5		11	3/4" BSPP	298	0	2258
-	FS1-5	CD1-L5	CD	1	L	5		12	3/4" BSPP	-298	0	2258
-	NS1-6	CD1-R6	CD	1	R	6		13	3/4" BSPP	298	0	2758
-	FS1-6	CD1-L6	CD	1	L	6		14	3/4" BSPP	-298	0	2758
IGN		CD2-T1	CD	2	T	1		15	1" BSPP	0	298	3258
TC3	TS2-1	CD2-T2	CD	2	T	2		NA	SURFACE	0	298	4508
-		CD2-B1	CD	2	B	1		16	1" BSPP	0	-298	2358
-	NS2-1	CD2-R1	CD	2	R	1		17	3/4" BSPP	298	0	3258
-	FS2-1	CD2-L1	CD	2	L	1		18	3/4" BSPP	-298	0	3258
-	NS2-2	CD2-R2	CD	2	R	2		19	3/4" BSPP	298	0	3758
-	FS2-2	CD2-L2	CD	2	L	2		20	3/4" BSPP	-298	0	3758
TC2	NS2-3	CD2-R3	CD	2	R	3		21	3/4" BSPP	298	0	4258
-	FS2-3	CD2-L3	CD	2	L	3		22	3/4" BSPP	-298	0	4258
-	NS2-4	CD2-R4	CD	2	R	4		23	3/4" BSPP	298	0	4758
-	FS2-4	CD2-L4	CD	2	L	4		24	3/4" BSPP	-298	0	4758
-	NS2-5	CD2-R5	CD	2	R	5		25	3/4" BSPP	298	0	5258
-	FS2-5	CD2-L5	CD	2	L	5		26	3/4" BSPP	-298	0	5258
-	NS2-6	CD2-R6	CD	2	R	6		27	3/4" BSPP	298	0	5758
-	FS2-6	CD2-L6	CD	3	L	6		28	3/4" BSPP	-298	0	5758
-		CD3-T1	CD	3	T	1		29	1" BSPP	0	298	6258
TC5	TS1-1	CD3-T2	CD	3	T	2		NA	SURFACE	0	298	7508
-		CD3-B1	CD	3	B	1		30	1" BSPP	0	-298	6258
-	NS3-1	CD3-R1	CD	3	R	1		31	3/4" BSPP	298	0	6258
-	FS3-1	CD3-L1	CD	3	L	1		32	3/4" BSPP	-298	0	6258
-	NS3-2	CD3-R2	CD	3	R	2		33	3/4" BSPP	298	0	6758
-	FS3-2	CD3-L2	CD	3	L	2		34	3/4" BSPP	-298	0	6758
TC4	NS3-3	CD3-R3	CD	3	R	3		35	3/4" BSPP	298	0	7258
-	FS3-3	CD3-L3	CD	3	L	3		36	3/4" BSPP	-298	0	7258
-	NS3-4	CD3-R4	CD	3	R	4		37	3/4" BSPP	298	0	7758
-	FS3-4	CD3-L4	CD	3	L	4		38	3/4" BSPP	-298	0	7758
KU0	NS3-5	CD3-R5	CD	3	R	5		39	3/4" BSPP	298	0	8258
-	FS3-5	CD3-L5	CD	3	L	5		40	3/4" BSPP	-298	0	8258
-	NS3-6	CD3-R6	CD	3	R	6		41	3/4" BSPP	298	0	8758
-	FS3-6	CD3-L6	CD	3	L	6		42	3/4" BSPP	-298	0	8758
-		CD4-T1	CD	4	T	1		43	1" BSPP	0	298	9258
TC7	TS1-1	CD4-T2	CD	4	T	2		NA	SURFACE	0	298	10508
-		CD4-B1	CD	4	B	1		44	1" BSPP	0	-298	9258
-	NS4-1	CD4-R1	CD	4	R	1		45	3/4" BSPP	298	0	9258
-	FS4-1	CD4-L1	CD	4	L	1		46	3/4" BSPP	-298	0	9258
KU1	NS4-2	CD4-R2	CD	4	R	2		47	3/4" BSPP	298	0	9758
-	FS4-2	CD4-L2	CD	4	L	2		48	3/4" BSPP	-298	0	9758
TC6	NS4-3	CD4-R3	CD	4	R	3		49	3/4" BSPP	298	0	10258
-	FS4-3	CD4-L3	CD	4	L	3		50	3/4" BSPP	-298	0	10258
-	NS4-4	CD4-R4	CD	4	R	4		51	3/4" BSPP	298	0	10758
OP0	FS4-4	CD4-L4	CD	4	L	4		52	3/4" BSPP	-298	0	10758
-	NS4-5	CD4-R5	CD	4	R	5		53	3/4" BSPP	298	0	11258
-	FS4-5	CD4-L5	CD	4	L	5		54	3/4" BSPP	-298	0	11258
OP1	NS4-6	CD4-R6	CD	4	R	6		55	3/4" BSPP	298	0	11758
IP0	FS4-6	CD4-L6	CD	4	L	6		56	3/4" BSPP	-298	0	11758

Sensor	OLD DESIGNATION	NEW DESIGNATION	Section	Section Number	Side	Horizontal Location	Vertical Location	PORT REF	SIZE	"X"	"Y"	"Z"
OP2		HR1-R1	HR	1	R	1		57	3/4" BSPP	308	0	12152
-		HR1-L1	HR	1	L	1		58	3/4" BSPP	-308	0	12152
TC8		HR1-R2	HR	1	R	2		59	3/4" BSPP	393	0	13160
-		HR1-L2	HR	1	L	2		60	3/4" BSPP	-393	0	13160
RA1		HR2-R2M	HR	2	R	2	M	61	11/4" BSPP	448	70	13785
RA1		HR2-L2M	HR	2	L	2	M	62	11/4" BSPP	-448	70	13785
TC16		HR2-R3M	HR	2	R	3	M	63	3/4" BSPP	528	410	14140
-		HR2-L3M	HR	2	L	3	M	64	3/4" BSPP	-528	410	14140
-		HR2-T3	HR	2	T	3		65	1" BSPP	0	1122	14215
RA2		HR2-R4M	HR	2	R	4	M	66	11/4" BSPP	598	700	14475
RA2		HR2-L4M	HR	2	L	4	M	67	11/4" BSPP	-598	700	14475
-		HR2-B5	HR	2	B	5		68	1" BSPP	0	-100	14745
KU2		HR2-T5	HR	2	T	5		69	1" BSPP	0	2315	14745
TC17		HR2-R5L	HR	2	R	5	L	70	3/4" BSPP	662	310	14745
IP1		HR2-L5L	HR	2	L	5	L	71	3/4" BSPP	-662	310	14745
OP3		HR2-R5M	HR	2	R	5	M	72	3/4" BSPP	662	975	14745
IP2		HR2-L5M	HR	2	L	5	M	73	3/4" BSPP	-662	975	14745
TC18		HR2-R5U	HR	2	R	5	U	74	3/4" BSPP	662	1660	14745
IP3		HR2-L5U	HR	2	L	5	U	75	3/4" BSPP	-662	1660	14745
KU3		HR3-L1L	HR	3	L	1	L	76	3/4" BSPP	-700	400	15140
TC19		HR3-L1M	HR	3	L	1	M	77	11/4" BSPP	-700	1335	15140
IP8		HR3-L1U	HR	3	L	1	U	78	3/4" BSPP	-700	2270	15140
IP4		HR3-R1L	HR	3	R	1	L	136	3/4" BSPP	700	400	15140
IP5		HR3-R1LM	HR	3	R	1	LM	137	3/4" BSPP	700	868	15140
IP6		HR3-R1M	HR	3	R	1	M	138	3/4" BSPP	700	1335	15140
-		HR3-R1UM	HR	3	R	1	UM	139	3/4" BSPP	700	1802	15140
IP7		HR3-R1U	HR	3	R	1	U	140	3/4" BSPP	700	2270	15140
-		HE1-R1L	HE	1	R	1	L	79	3/4" BSPP	700	400	15600
-		HE1-R1M	HE	1	R	1	M	80	3/4" BSPP	700	1335	15600
KU4		HE1-R1U	HE	1	R	1	U	81	3/4" BSPP	700	2270	15600
TC20		HE2-R1L	HE	2	R	1	L	83	3/4" BSPP	700	400	16090
IP9		HE2-R1M	HE	2	R	1	M	84	3/4" BSPP	700	1335	16090
TC21		HE2-R1U	HE	2	R	1	U	85	3/4" BSPP	700	2270	16090
KU5		HE3-R1L	HE	3	R	1	L	87	3/4" BSPP	700	400	16580
-		HE3-R1M	HE	3	R	1	M	88	3/4" BSPP	700	1335	16580
-		HE3-R1U	HE	3	R	1	U	89	3/4" BSPP	700	2270	16580
OP4		HE1-T1	HE	1	T	1		82	3/4" BSPP HOLE	-47	2735	15600
OP5		HE2-T1	HE	2	T	1		86	3/4" BSPP HOLE	0	2735	16090
OP6		HE3-T1	HE	3	T	1		90	3/4" BSPP HOLE	-47	2735	16580
OP7		HR4-T1	HR	4	T	1		91	1" BSPP	0	2735	16985
-		HR4-B1	HR	4	B	1		92	1" BSPP	0	-65	16985
KU6		HR4-R1L	HR	4	R	1	L	93	3/4" BSPP	700	400	16985
IP10		HR4-L1L	HR	4	L	1	L	94	3/4" BSPP	-700	400	16985
OP8		HR4-R1M	HR	4	R	1	M	95	3/4" BSPP	700	1335	16985
IP11		HR4-L1M	HR	4	L	1	M	96	3/4" BSPP	-700	1335	16985
IP13		HR4-R1U	HR	4	R	1	U	97	3/4" BSPP	700	2270	16985
IP12		HR4-L1U	HR	4	L	1	U	98	3/4" BSPP	-700	2270	16985
RA3		HR4-R3M	HR	4	R	3	M	99	11/4" BSPP	700	1335	17575
RA3		HR4-L3M	HR	4	L	3	M	100	11/4" BSPP	-700	1335	17575
RA4		HR4-R3L	HR	4	R	3	L	141	11/4" BSPP	700	400	17575
IP14		HR4-R3U	HR	4	R	3	U	142	3/4" BSPP	700	2270	17575
RA4		HR4-L3L	HR	4	L	3	L	143	11/4" BSPP	-700	400	17575
-		HR4-L3U	HR	4	L	3	U	144	3/4" BSPP	-700	2270	17575
IP18		HR4-R5M	HR	4	R	5	M	101	3/4" BSPP	700	1335	18165
IP16		HR4-L5M	HR	4	L	5	M	102	3/4" BSPP	-700	1335	18165
OP9		HR4-R5L	HR	4	R	5	L	145	3/4" BSPP	700	400	18165
KU7		HR4-R5U	HR	4	R	5	U	146	3/4" BSPP	700	2270	18165
IP15		HR4-L5L	HR	4	L	5	L	147	3/4" BSPP	-700	400	18165
IP17		HR4-L5U	HR	4	L	5	U	148	3/4" BSPP	-700	2270	18165
-		HR5-R1M	HR	5	R	1	M	NA	SURFACE	700	1200	18455

Sensor	OLD DESIGNATION	NEW DESIGNATION	Section	Section Number	Side	Horizontal Location	Vertical Location	PORT REF	SIZE	"X"	"Y"	"Z"
OP10		HR5-T2	HR	5	T	2		103	1" BSPP	0	2735	18775
-		HR5-B2	HR	5	B	2		104	1" BSPP	0	-65	18775
KU8		HR5-R2L	HR	5	R	2	L	105	3/4" BSPP	700	400	18775
IP19		HR5-L2L	HR	5	L	2	L	106	3/4" BSPP	-700	400	18775
OP11		HR5-R2M	HR	5	R	2	M	107	3/4" BSPP	700	1335	18775
IP20		HR5-L2M	HR	5	L	2	M	108	3/4" BSPP	-700	1335	18775
IP22		HR5-R2U	HR	5	R	2	U	109	3/4" BSPP	700	2270	18775
IP21		HR5-L2U	HR	5	L	2	U	110	3/4" BSPP	-700	2270	18775
TC22		HR5-R4M	HR	5	R	4	M	111	11/4" BSPP	700	1335	19375
-		HR5-L4M	HR	5	L	4	M	112	11/4" BSPP	-700	1335	19375
TC23		HR6-R1M	HR	6	R	1	M	113	3/4" BSPP	700	1335	19985
IP23		HR6-L1M	HR	6	L	1	M	114	3/4" BSPP	-700	1335	19985
-		HR6-T3	HR	6	T	3		115	1" BSPP	0	2735	20575
-		HR6-B3	HR	6	B	3		116	3/4" BSPP	0	-65	20575
KU9		HR6-R3L	HR	6	R	3	L	117	3/4" BSPP	700	400	20575
-		HR6-L3L	HR	6	L	3	L	118	3/4" BSPP	-700	400	20575
-		HR6-R3M	HR	6	R	3	M	119	11/4" BSPP	700	1335	20575
-		HR6-L3M	HR	6	L	3	M	120	11/4" BSPP	-700	1335	20575
-		HR6-R3U	HR	6	R	3	U	121	3/4" BSPP	700	2270	20575
-		HR6-L3U	HR	6	L	3	U	122	3/4" BSPP	-700	2270	20575
-		HR6-B5	HR	6	B	5		123	1" BSPP	0	-65	21165
TC24		HR6-R5L	HR	6	R	5	L	124	3/4" BSPP	700	400	21165
KU10		HR6-L5L	HR	6	L	5	L	125	3/4" BSPP	-700	400	21165
-		HR6-R5M	HR	6	R	5	M	126	3/4" BSPP	700	1335	21165
-		HR6-L5M	HR	6	L	5	M	127	3/4" BSPP	-700	1335	21165
TC25		HR6-R5U	HR	6	R	5	U	128	3/4" BSPP	700	2270	21165
-		HR6-L5U	HR	6	L	5	U	129	3/4" BSPP	-700	2270	21165
-		EP-1L	EP			1	L	130	1" BSPP	650	-15	21330
-		EP-2L	EP			2	L	131	1" BSPP	0	-15	21330
-		EP-3L	EP			3	L	132	1" BSPP	-650	-15	21330
-		EP-1M	EP			1	M	133	1" BSPP	250	1335	21330
-		EP-2M	EP			2	M	134	1" BSPP	-250	1335	21330
-		EP-1U	EP			1	U	135	3/4" BSPP	0	2270	21330


RIGHT HAND SIDE
TC0
TC2
TC4
KU0
KU1
TC6
OP1
OP2
TC8
RA1
TC16
TC18
RA2
OP3
TC17
IP7
KU4
TC21
IP13
IP14
IP22
TC25
IP6
IP9
OP8
RA3
IP18
OP11
TC22
TC23
IP5
IP4
TC20
KU5
KU6
RA4
KU8
KU9
TC24
Differential
Pressure Sensor
TOP
IGN
KU2
OP4
OP5
OP6
OP7
OP10
LEFT HAND SIDE (MIRROR IMAGE)
OP0
IP0
RA1
IP8
IP3
TC19
IP2
RA2
IP1
KU3
IP12
IP21
IP11
RA3
IP16
IP20
IP23
IP10
RA4
IP19
KU10