Date	28 February 2019
Time	13:52:20
Test Number	HRSG Test 53
Mixture Composition	100% CH4
Ambient Temperature	6.9 °C
Ambient Pressure	965 mbar
Wind Speed	4 m/s
Wind direction	NNW
Relative Humidity	90.00%
Mass Flow	9.8780 kg/s
Equivalence Ratio	0.81

General Comments: (weather, rig configuration)

Weather: Cloudy with occasional shower.

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

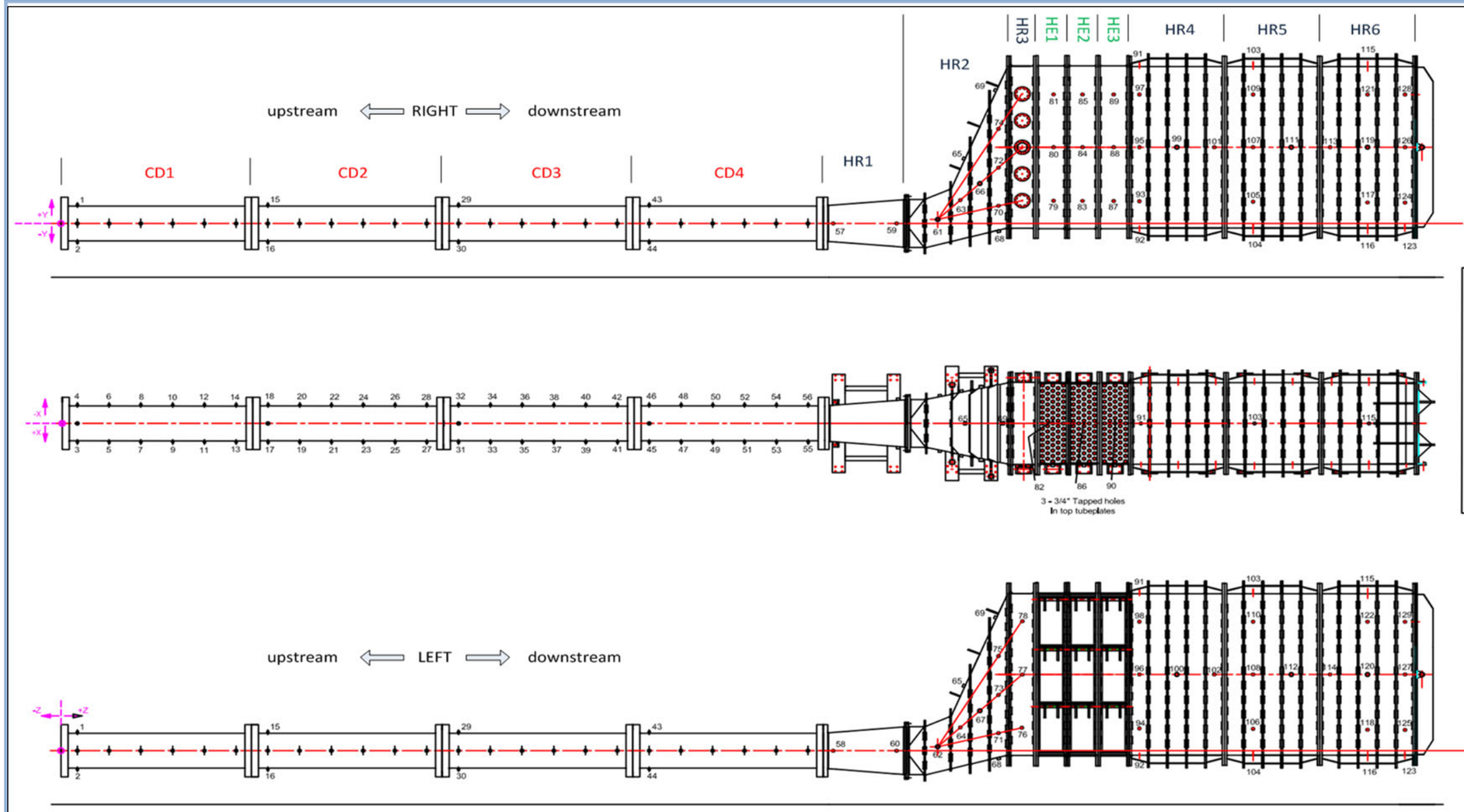
Engine Speed: 12%; 8,100 rpm

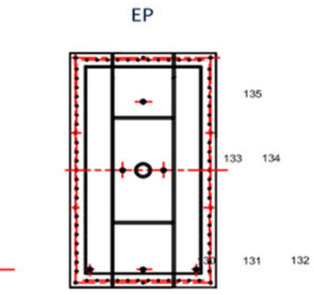
Test on 100% CH4 at an intended EQR of 0.80
LOW TEMPERATURE TESTS (NOMINAL 320 oC).

Test gave a fairly strong combustion event with most sensors providing a good response.

	Max overpressure	Max. gas temperature	Ionisation Probes: Max. flame speed	Ionisation Rakes: Max. flame speed	Optical Probes: Max. flame speed
	831 mbar	1345 °C	326 m/s	185 m/s	390 m/s
Initial gas temperature		271 °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	KU1	TC2	IP1	RA2	OP2
label	CD4-R2	CD2-R3	HR2-L5L	HR2-R4M	HR1-R1
distance	9758 mm	4258 mm	14745 mm	14475 mm	12152 mm





INSTRUMENT PORTS

76 - INSTRUMENT PORTS IN ST ST 40mm HIGH TAPPED THROUGH (50 - 3/4" BSPP, 15 - 1" BSPP & 11 - 1 1/4" BSPP) HOLES THROUGH PLATE W.B.L. 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 - 1 1/4" ON EACH SIDE, 4 - 3/4" ON EACH SIDE
SECTION 3:	1 - 1 1/4" 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 - 1 1/4" ON CENTRE OF EACH SIDE, 4 - 3/4" ON EACH SIDE
SECTION 5:	1 - 1" ON TOP, 1 - 1" ON BASE, 1 - 1 1/4" ON EACH SIDE 3 - 3/4" ON EACH SIDE
SECTION 6:	1 - 1" ON TOP, 2 - 1" ON BASE, 1 - 1 1/4" 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

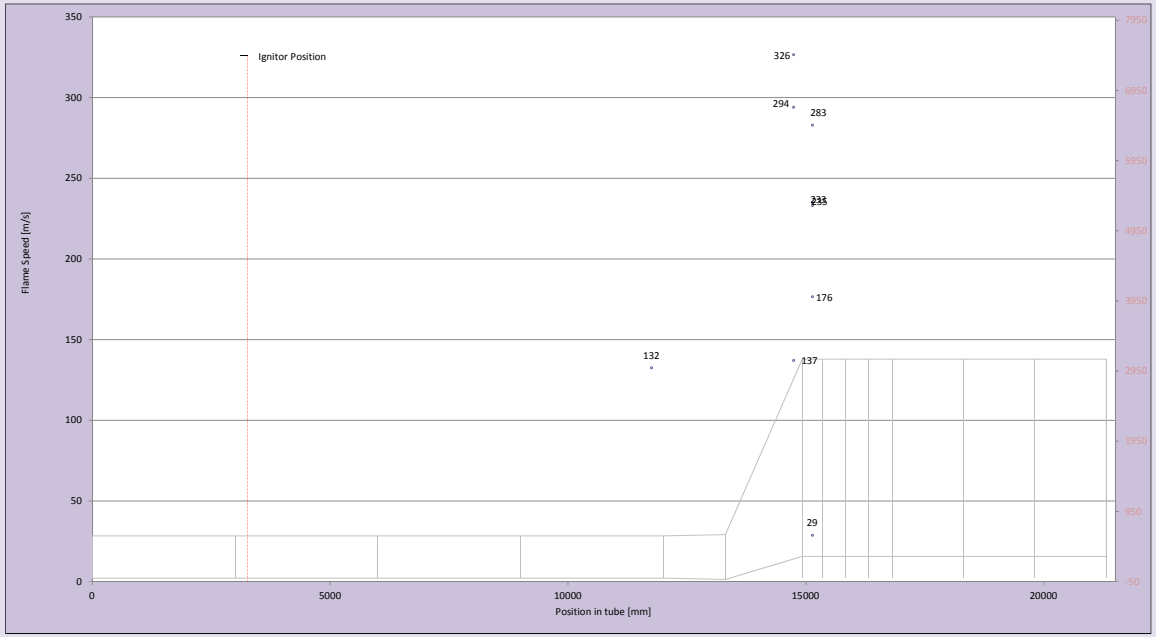
CD	Circular duct	**U**	Upper
HR	HRSG	**M**	Middle
HE	Heat Exchanger	**L**	Lower
EP	End Plate	**R**	Right Side (when viewed downstream from engine)
		L	Left Side
		T	Top
		B	Bottom

There are 13 sections on the rig

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

Location of igniter 3258 mm **Time of ignition** 16.64657 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	Ionisation probe 0	11758	16.71082	132
IP1	HR2-L5L	Ionisation probe 1	14745	16.71997	326
IP2	HR2-L5M	Ionisation probe 2	14745	16.72098	294
IP3	HR2-L5U	Ionisation probe 3	14745	16.73264	137
IP4	HR3-R1L	Ionisation probe 4	15140	16.72278	283
IP5	HR3-R1LM	Ionisation probe 5	15140	16.72534	233
IP6	HR3-R1M	Ionisation probe 6	15140	16.72522	235
IP7	HR3-R1U	Ionisation probe 7	15140	16.72999	176
IP8	HR3-L1U	Ionisation probe 8	15140	16.74649	29
IP9	HE2-R1M	Ionisation probe 9	16090		
IP10	HR4-L1L	Ionisation probe 10	16985		
IP11	HR4-L1M	Ionisation probe 11	16985		
IP12	HR4-L1U	Ionisation probe 12	16985		
IP13	HR4-R1U	Ionisation probe 13	16985		
IP14	HR4-R3U	Ionisation probe 14	17575		
IP15	HR4-L5L	Ionisation probe 15	18165		
IP16	HR4-L5M	Ionisation probe 16	18165		
IP17	HR4-L5U	Ionisation probe 17	18165		
IP18	HR4-R5M	Ionisation probe 18	18165		
IP19	HR5-L2L	Ionisation probe 19	18775	16.75253	
IP20	HR5-L2M	Ionisation probe 20	18775	16.75927	
IP21	HR5-L2U	Ionisation probe 21	18775	16.78373	
IP22	HR5-R2U	Ionisation probe 22	18775	16.82896	
IP23	HR6-L1M	Ionisation probe 23	19985	16.73581	



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

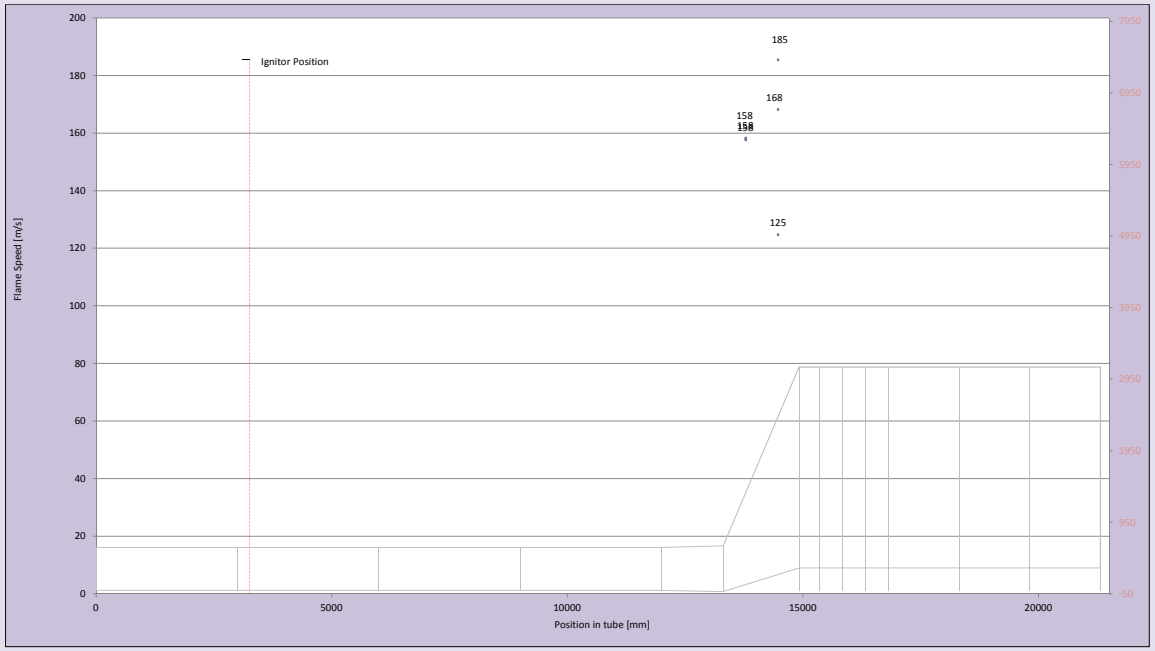
Only a weak responses from IP sensors. Most sensors did not give a response to the combustion event - some did give a very weak response but flame arrival time was not easily identified. Further analysis required

Location of igniter 3258 mm **Time of ignition** 16.64657 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	16.7133	158
RA1	IP25	HR2-R2M	IP25	13785	16.7131	158
RA1	IP26	HR2-R2M	IP26	13785	16.7131	158
RA2	IP27	HR2-R4M	IP27	14475	16.7189	125
RA2	IP28	HR2-R4M	IP28	14475	16.7168	185
RA2	IP29	HR2-R4M	IP29	14475	16.7172	168
RA3	IP30	HR4-R3M	IP30	17575		
RA3	IP31	HR4-R3M	IP31	17575		
RA3	IP32	HR4-R3M	IP32	17575		
RA4	IP33	HR4-R3L	IP33	17575		
RA4	IP34	HR4-R3L	IP34	17575		
RA4	IP35	HR4-R3L	IP35	17575		

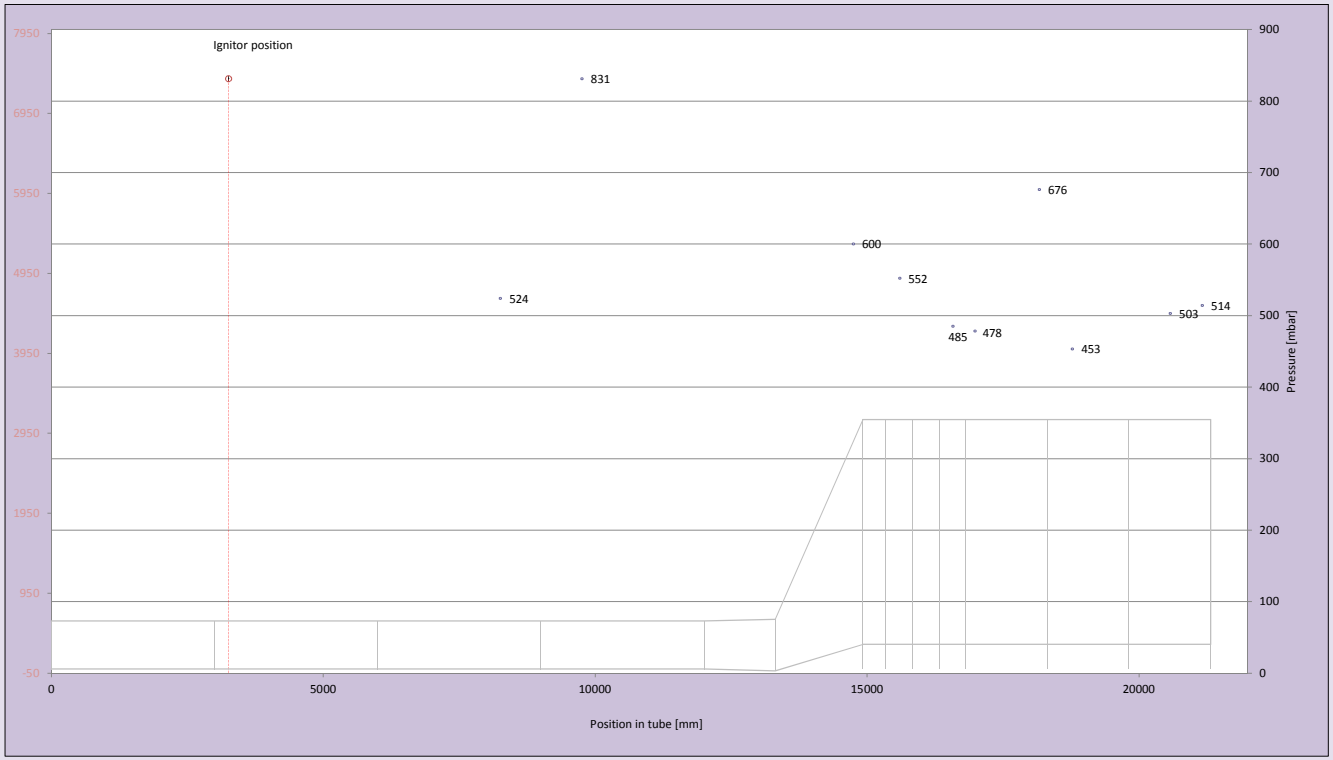
KEY: ND - not detected - sensor working but flame too weak to be picked up
NW - not working - sensor not working.

A very weak combustion event.



Location of igniter 3258 mm

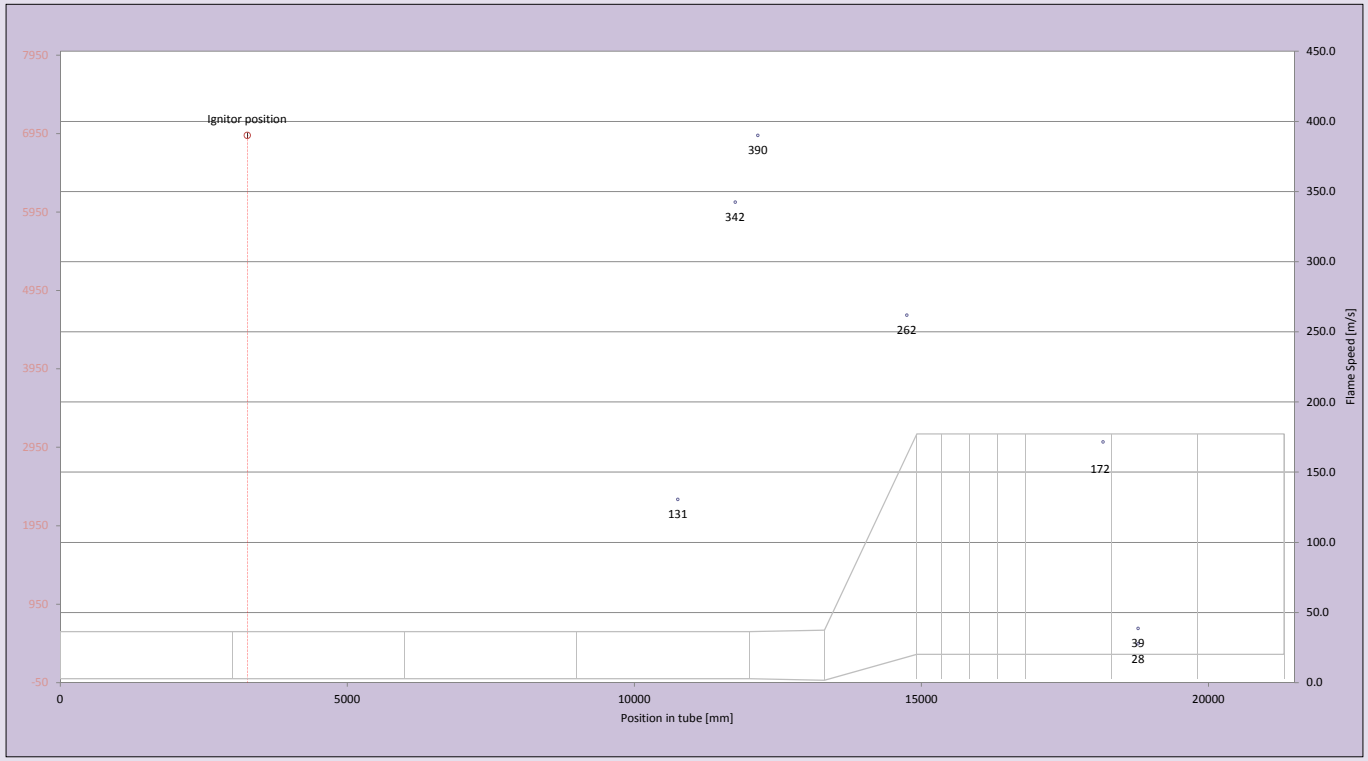
Transducer number	Location	Position in tube [mm]	ΔPmax [mbar]	TimeΔPmax [sec]
KU0	CD3-R5	8258	524	16.8006
KU1	CD4-R2	9758	831	16.7324
KU2	HR2-T5	14745	600	16.7280
KU3	HR3-L1L	15140		
KU4	HE1-R1U	15600	552	16.7280
KU5	HE3-R1L	16580	485	16.7297
KU6	HR4-R1L	16985	478	16.7708
KU7	HR4-R5U	18165	676	16.8304
KU8	HR5-R2L	18775	453	16.7863
KU9	HR6-R3L	20575	503	16.7636
KU10	HR6-L5L	21165	514	16.7665



Location of igniter 3258 mm **Time of ignitio** 16.64657 seconds

OP Number	Location label	Position in tube (mm)	Flame arrival time (s)	Average flame speed (m/s)
OP0	CD4-L4	10758	16.7040	130.7
OP1	CD4-R6	11758	16.7069	342.5
OP2	HR1-R1	12152	16.7079	390.1
OP3	HR2-R5M	14745	16.7178	261.9
OP4	HE1-T1	15600	16.7460	
OP5	HE2-T1	16090	16.7535	
OP6	HE3-T1	16580	16.7639	
OP7	HR4-T1	16985	16.7556	
OP8	HR4-R1M	16985	16.7621	
OP9	HR4-R5L	18165	16.7377	171.6
OP10	HR5-T2	18775	16.7535	38.7
OP11	HR5-R2M	18775	16.7597	27.8

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

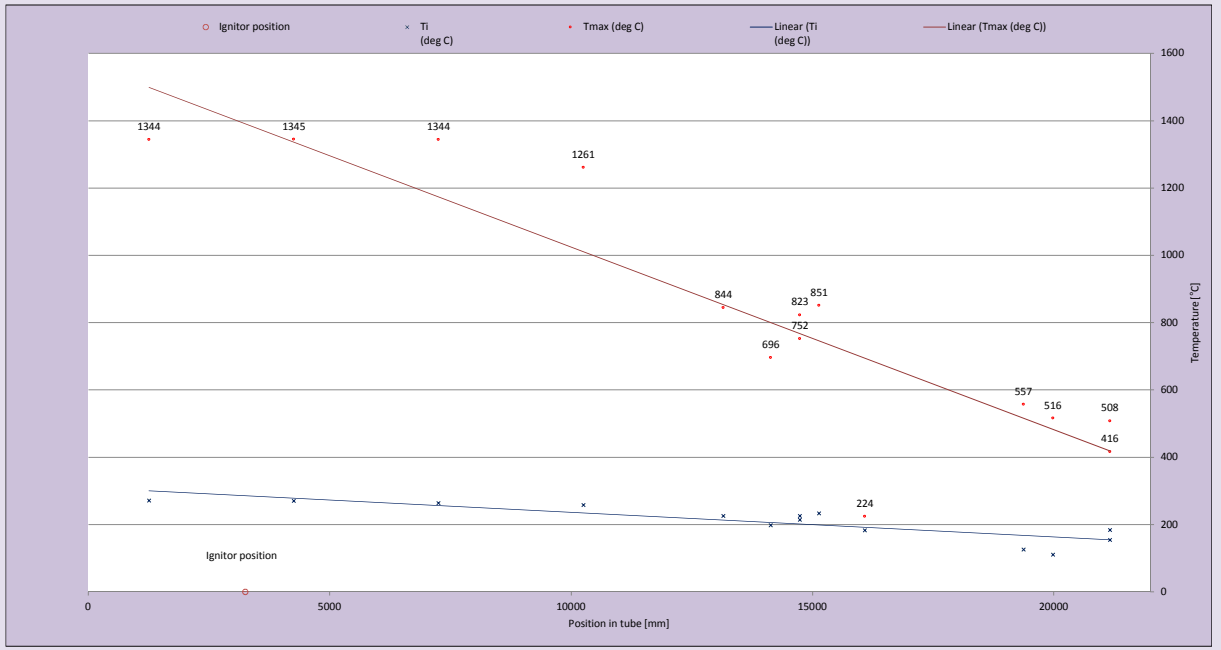


Location of igniter 3258 mm **Time of ignition** 16.64657 seconds

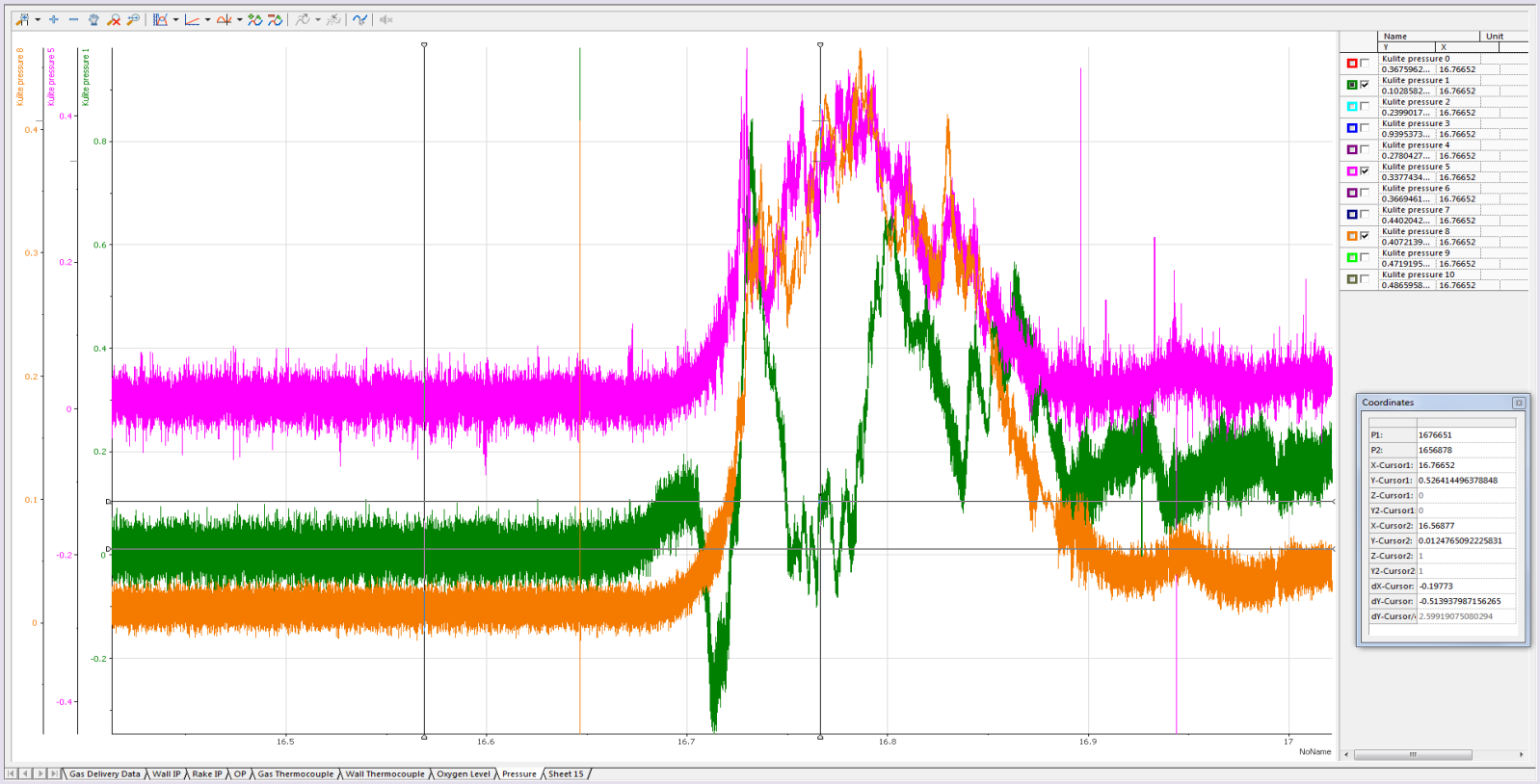
Thermocouple number	Location	Position in tube (mm)	T_{max} (deg C)	T_i (deg C)
TC0	CD1-R3	1258	1344	272
TC2	CD2-R3	4258	1345	271
TC4	CD3-R3	7258	1344	264
TC6	CD4-R3	10258	1261	258
TC8	HR1-R2	13160	844	226
TC12	CD3-T1	6258	593	260
TC13	CD3-L1	6258	628	265
TC14	CD3-B1	6258		
TC15	CD3-R1	6258	625	277
TC16	HR2-R3M	14140	696	198
TC17	HR2-R5L	14745	823	226
TC18	HR2-R5U	14745	752	215
TC19	HR3-L1M	15140	851	234
TC20	HE2-R1L	16090		
TC21	HE2-R1U	16090	224	183
TC22	HR5-R4M	19375	557	126
TC23	HR6-R1M	19985	516	111
TC24	HR6-R5L	21165	416	155
TC25	HR6-R5U	21165	508	184

surface thermocouples [not plotted]

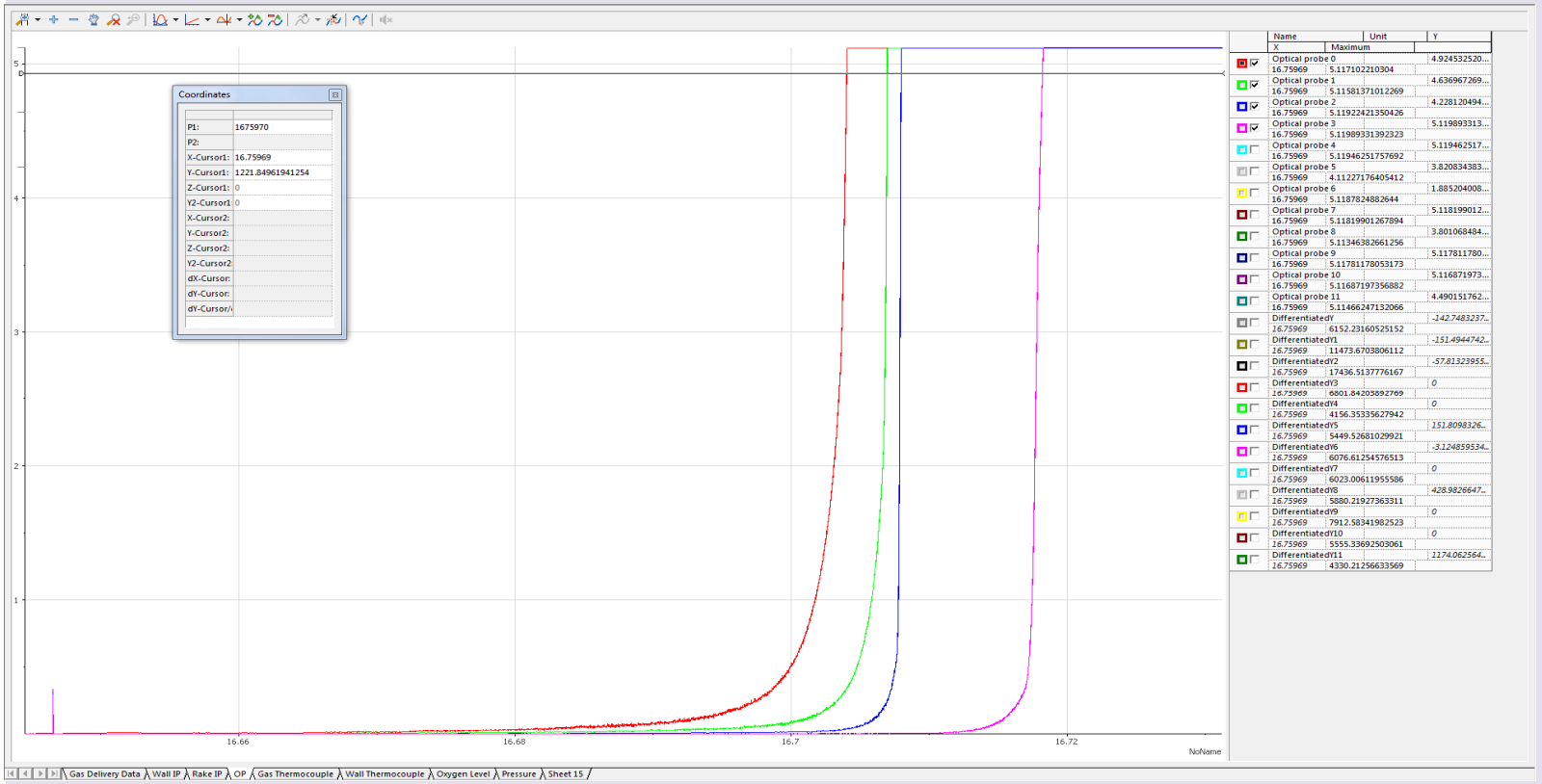
TC1	CD1-T2	1508	118	112
TC3	CD2-T2	4508	106	97
TC5	CD3-T2	7508	108	102
TC7	CD4-T2	10508	89	83



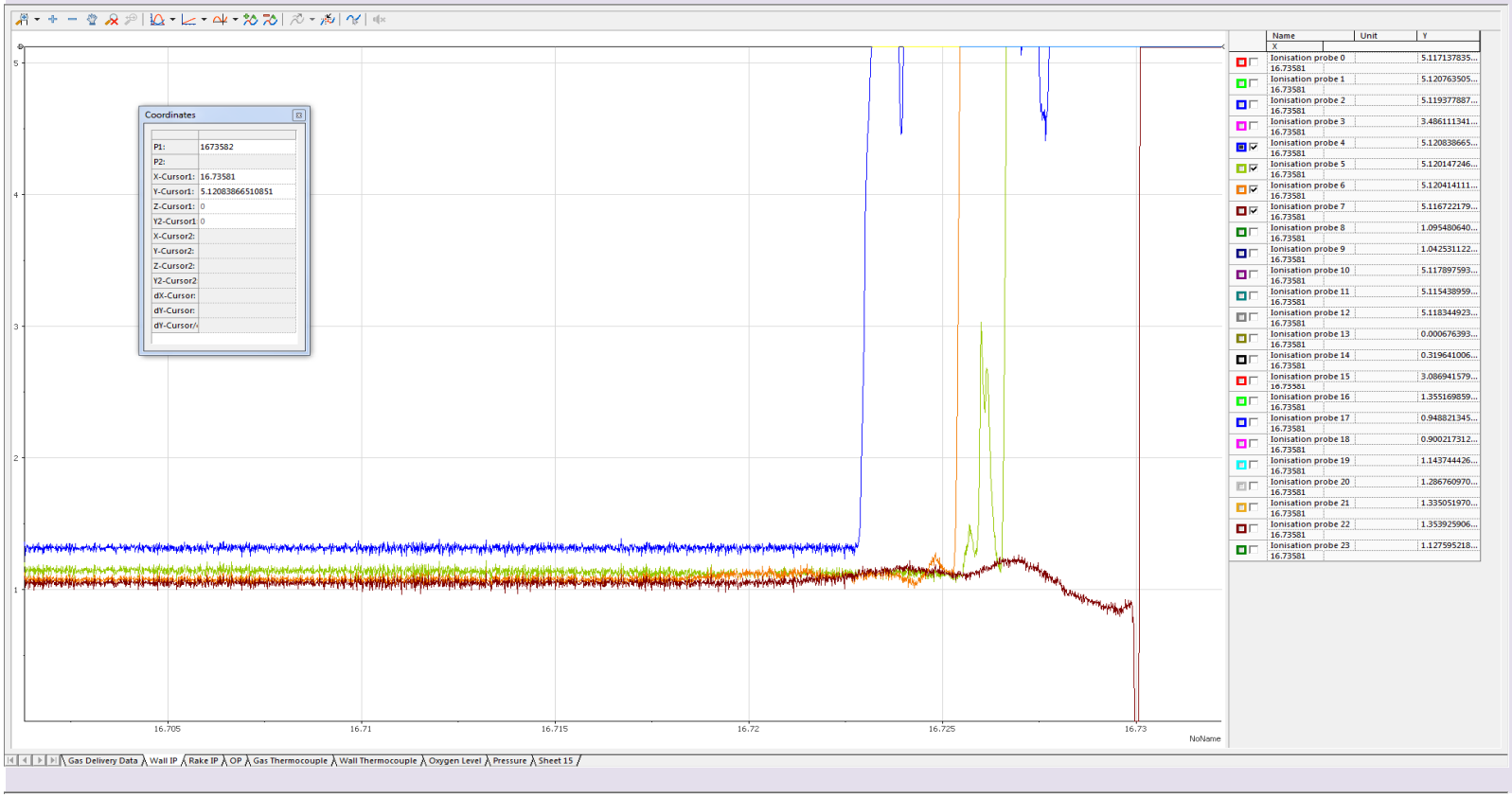
Pressure


Kulite pressure 8
Kulite pressure 5
Kulite pressure 1
Name
Unit
Kulite pressure 0
Kulite pressure 1
Kulite pressure 2
Kulite pressure 3
Kulite pressure 4
Kulite pressure 5
Kulite pressure 6
Kulite pressure 7
Kulite pressure 8
Kulite pressure 9
Kulite pressure 10
Coordinates
P1: 1676651
P2: 1656878
X-Cursor1: 16.76652
Y-Cursor1: 0.526414496378848
Z-Cursor1: 0
Y2-Cursor1 0
X-Cursor2: 16.56877
Y-Cursor2: 0.0124765092225831
Z-Cursor2: 1
Y2-Cursor2 1
dX-Cursor: -0.19773
dY-Cursor: -0.513937987156265
dY-Cursor/ 2.59919075080294
16.5
16.6
16.7
16.8
16.9
17
NoName
Gas Delivery Data
Wall IP
Rake IP
OP
Gas Thermocouple
Wall Thermocouple
Oxygen Level
Pressure
Sheet 15

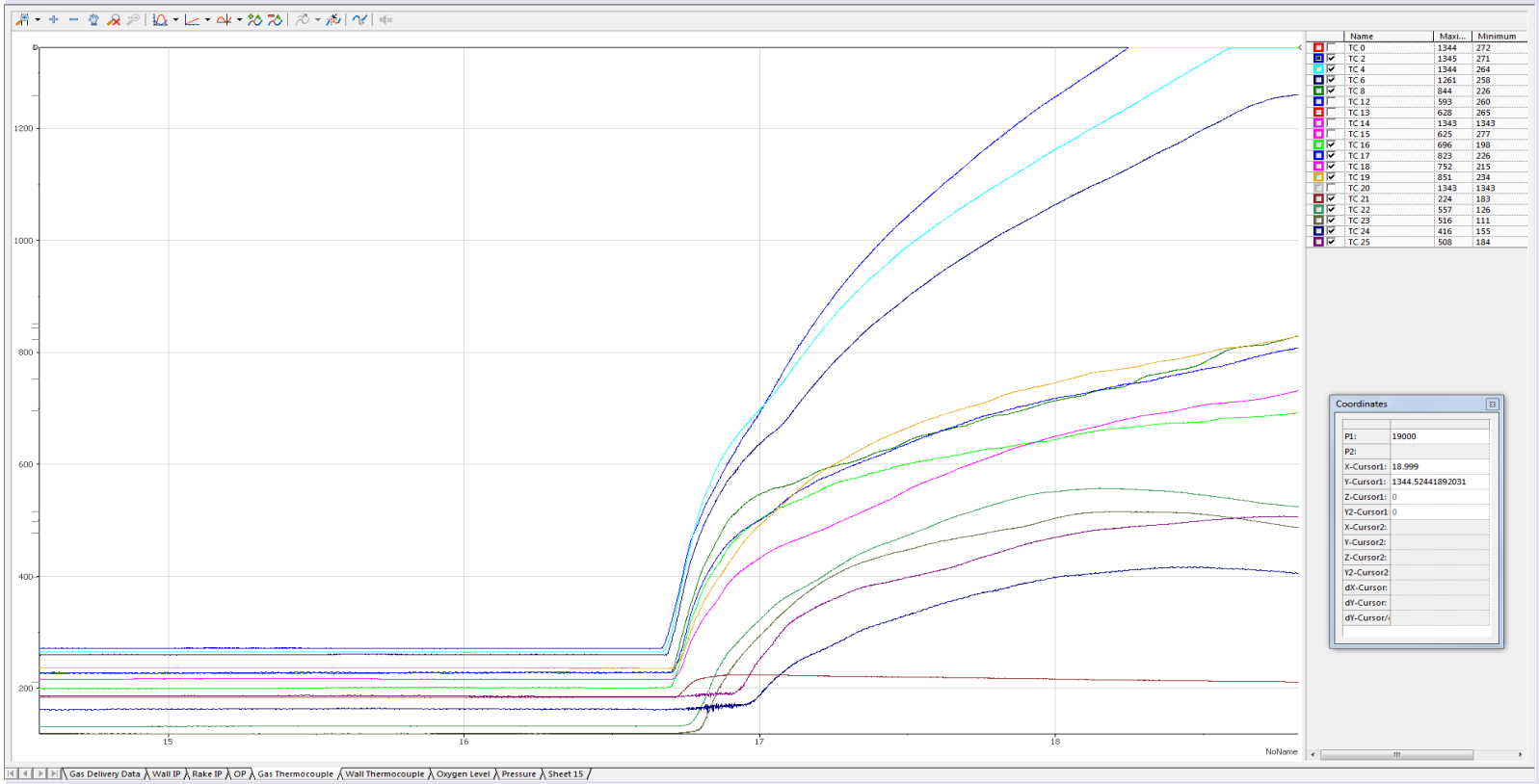
Optical Probes

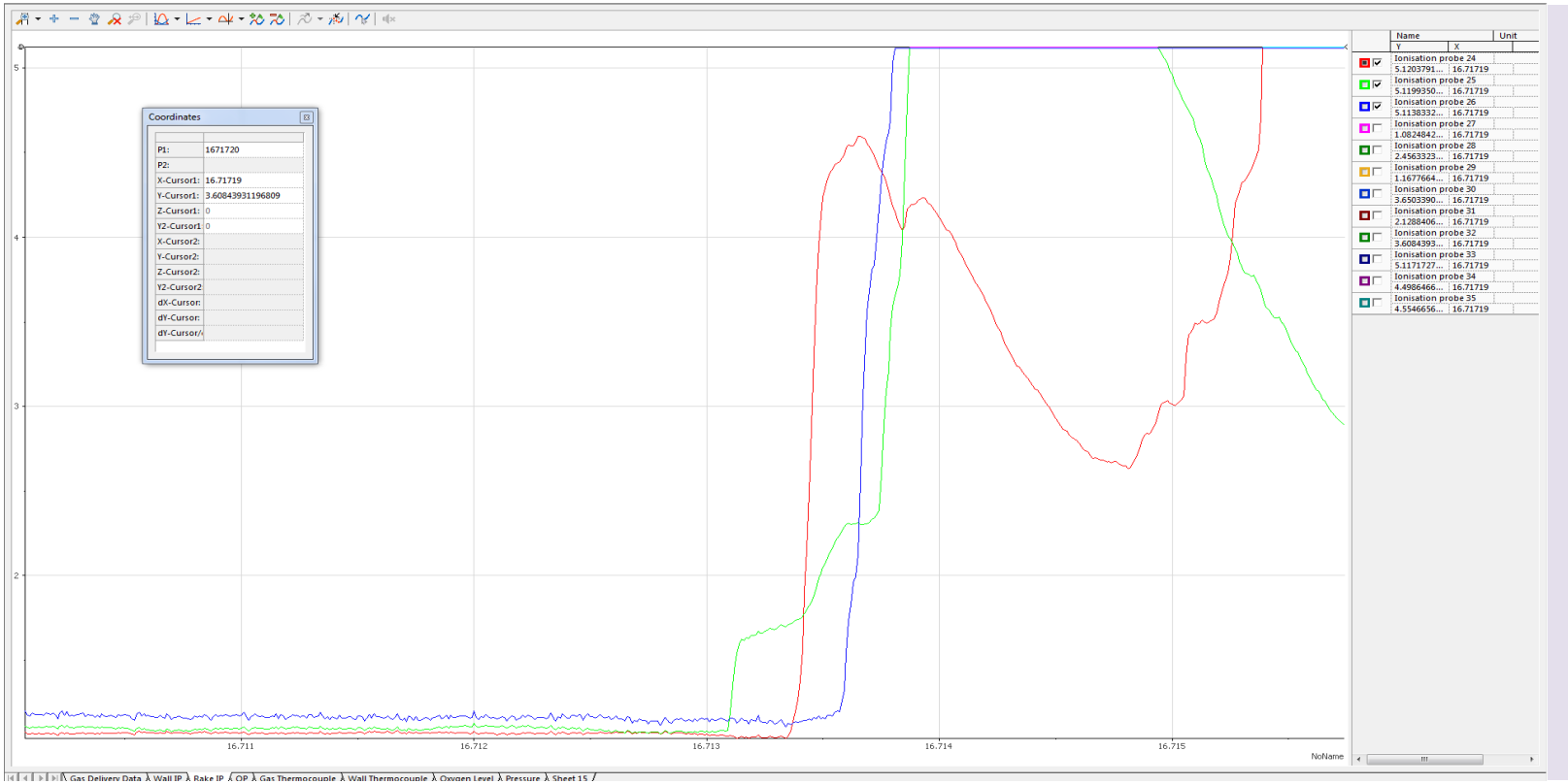


Ionisation Probes



Temperature




Coordinates
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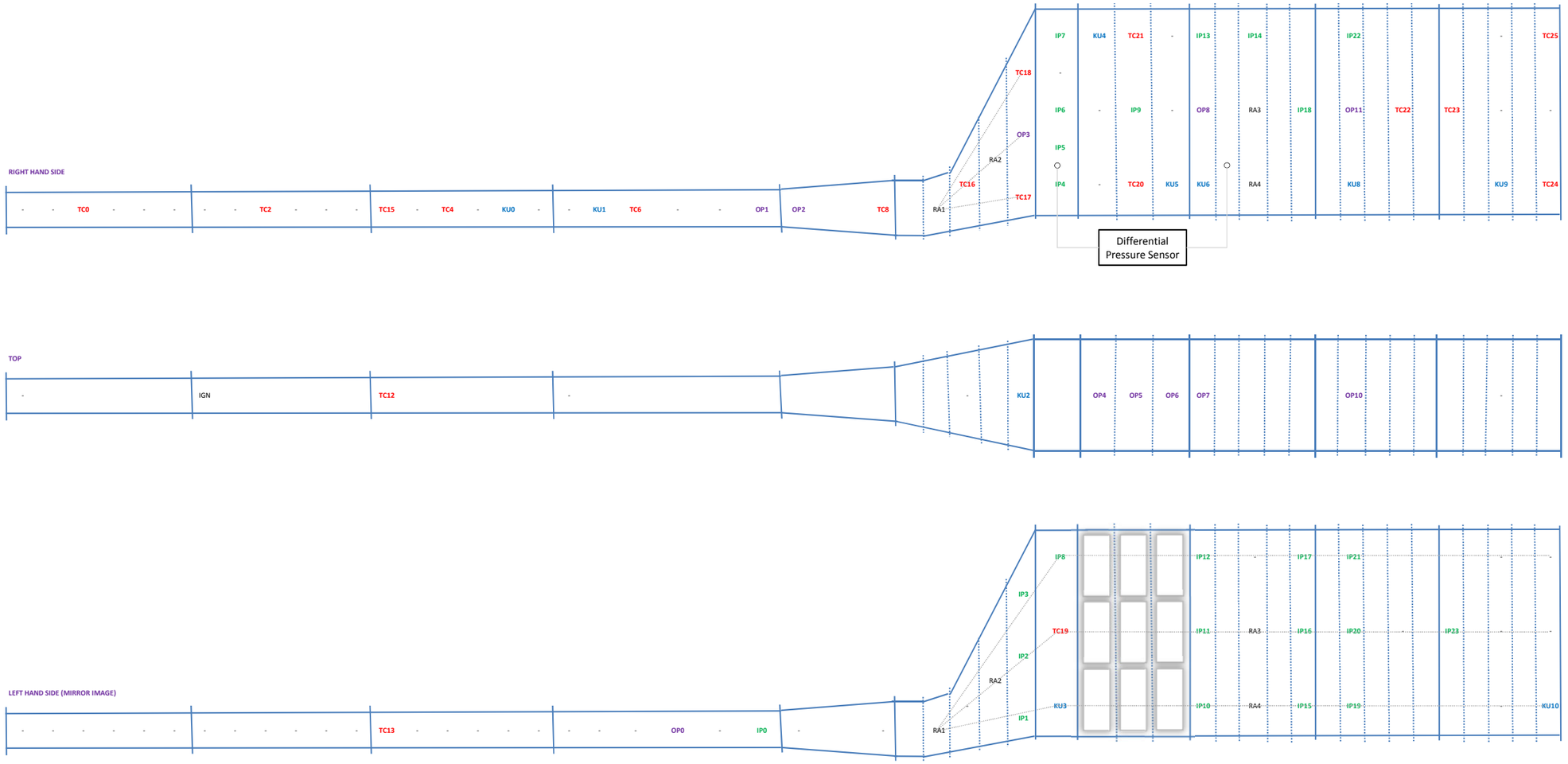
P2:
X-Cursor1: 16.71719
Y-Cursor1: 3.60843931196809
Z-Cursor1: 0
Y2-Cursor1 0
X-Cursor2:
Y-Cursor2:
Z-Cursor2:
Y2-Cursor2
dX-Cursor:
dY-Cursor:
dY-Cursor/
Name
Unit
Y
X
Ionisation probe 24 5.1203791... 16.71719
Ionisation probe 25 5.1199350... 16.71719
Ionisation probe 26 5.1138332... 16.71719
Ionisation probe 27 1.0824842... 16.71719
Ionisation probe 28 2.4563323... 16.71719
Ionisation probe 29 1.1677664... 16.71719
Ionisation probe 30 3.6503390... 16.71719
Ionisation probe 31 2.1288406... 16.71719
Ionisation probe 32 3.6084393... 16.71719
Ionisation probe 33 5.1171727... 16.71719
Ionisation probe 34 4.4986466... 16.71719
Ionisation probe 35 4.5546656... 16.71719
5
4
3
2
16.711
16.712
16.713
16.714
16.715
NoName
Gas Delivery Data
Wall IP
Rake IP
OP
Gas Thermocouple
Wall Thermocouple
Oxygen Level
Pressure
Sheet 15

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
TC12		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
TC14		CD3-B1	CD	3	B	1		30	1" BSPP	0	-298	6258
TC15	NS3-1	CD3-R1	CD	3	R	1		31	3/4" BSPP	298	0	6258
TC13	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

Sensor	OLD DESIGNATION	NEW DESIGNATION	Section	Section Number	Side	Horizontal Location	Vertical Location	PORT REF	SIZE	"X"	"Y"	"Z"
IP0	FS4-6	CD4-L6	CD	4	L	6		56	3/4" BSPP	-298	0	11758
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

Sensor	OLD DESIGNATION	NEW DESIGNATION	Section	Section Number	Side	Horizontal Location	Vertical Location	PORT REF	SIZE	"X"	"Y"	"Z"
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
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
TC15
TC4
KU0
KU1
TC6
OP1
OP2
TC8
RA1
TC16
TC18
OP3
RA2
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
TC12
KU2
OP4
OP5
OP6
OP7
OP10
LEFT HAND SIDE (MIRROR IMAGE)
TC13
OP0
IP0
RA1
IP3
IP2
RA2
IP1
IP8
TC19
KU3
IP12
IP17
IP21
IP11
RA3
IP16
IP20
IP23
IP10
RA4
IP15
IP19
KU10