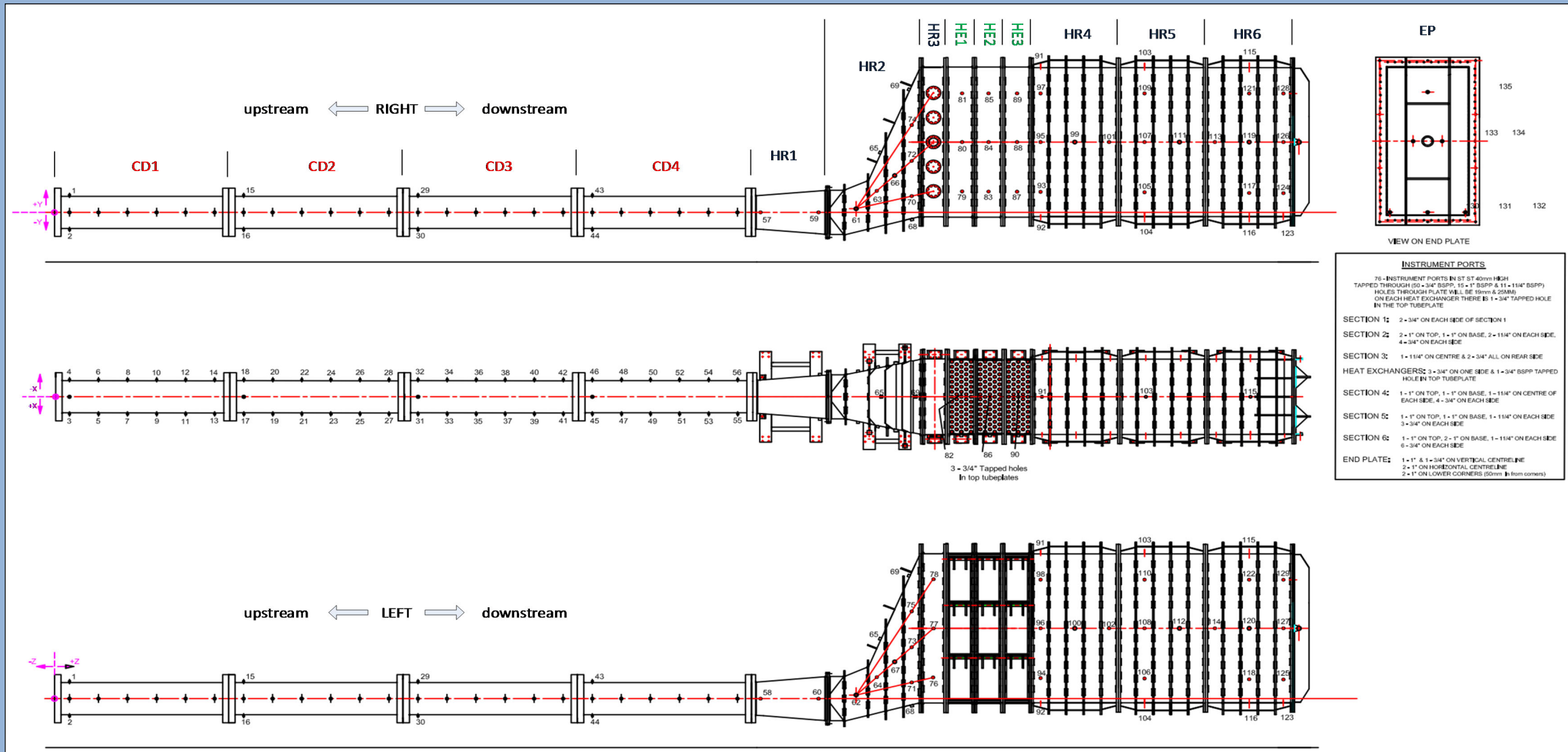


Date	08 January 2019	General Comments: (weather, rig configuration) Weather: Sunny part cloud. Cold and crisp, light wind. Rig configuration: 4 x 3m circular duct; expansion section and HRSG attached. End Plate attached. Igniter 258mm from beginning of 2nd circular duct section Engine Speed: 40%; 11,800 rpm Test on 60% CH4 40% H2 at an intended EQR of 0.60 The test gave a strong combustion event and most sensors provided an identifiable response. Highest overpressure of 488 mbar seen in duct on KU1
Time	11:24:57	
Test Number	HRSG Test 27	
Mixture Composition	40/60 H2/CH4	
Ambient Temperature	3.3 °C	
Ambient Pressure	979 mbar	
Wind Speed	4.9 m/s	
Wind direction	NW	
Relative Humidity	89.00%	
Mass Flow	9.9890 kg/s	
Equivalence Ratio		

		Ionisation Probes		Ionisation Rakes		Optical Probes	
Max overpressure		Max. gas temperature		Max. flame speed		Max. flame speed	
488 mbar		1270 °C		404 m/s		173 m/s	
		Initial gas temperature				327 m/s	
		442 °C					
Location of Max. Overpressure		Location of Max. Temperature		Location of Max. Flame Speed		Location of Max. Flame Speed	
sensor	KU1	sensor	TC4	sensor	IP9	sensor	RA1
label	CD4-R2	label	CD3-R3	label	HE2-R1M	label	HR2-R2M
distance	9758 mm	distance	7258 mm	distance	16090 mm	distance	13785 mm
						distance	11758 mm



INSTRUMENT PORTS

76 - INSTRUMENT PORTS IN ST 40mm HIGH TAPPED THROUGH (Ø 3/4" BSPP, 15 x 1" BSPP & 11 x 1/4" BSPP) HOLES THROUGH PLATE WALL (Ø 10mm & 20mm) ON EACH HEAT EXCHANGER THERE IS 1 x 3/4" TAPPED HOLE IN THE TOP TUBEPLATE

SECTION 1: 2 x 3/4" ON EACH SIDE OF SECTION 1

SECTION 2: 2 - 1" ON TOP, 1 - 1" ON BASE, 2 - 1/4" ON EACH SIDE, 4 - 3/4" ON EACH SIDE

SECTION 3: 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 - 1/4" ON CENTRE OF EACH SIDE, 4 - 3/4" ON EACH SIDE

SECTION 5: 1 - 1" ON TOP, 1 - 1" ON BASE, 1 - 1/4" ON EACH SIDE, 3 - 3/4" ON EACH SIDE

SECTION 6: 1 - 1" ON TOP, 2 - 1" ON BASE, 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 (Ø 10mm & Ø 20mm)

Naming Convention

Section Identifier i.e. HE, HR, CD or EP	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
Section Number (1-6) Numbered from downstream to upstream		Longitudinal position in section (numbered from 1)

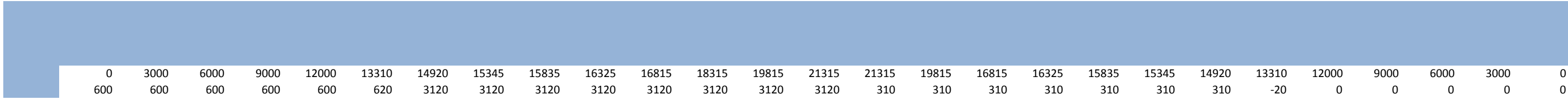
Example: **HR 1 - R 1 U**

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

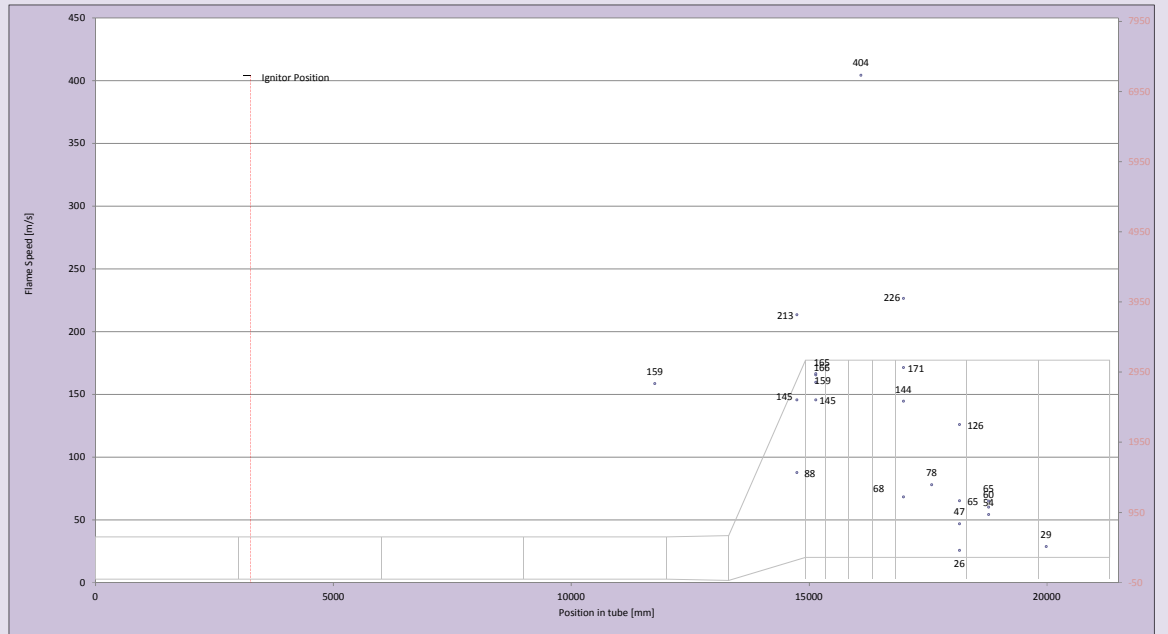
- 4 circular duct sections (CD1 to CD4)
- 6 HRSG sections (HR1 to HR6)
- 3 heat exchanger sections (HE1 to HE3) located between HR3 and HR4



Location of igniter mm Time of ignition 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	16.64671	159
IP1	HR2-L5L	Ionisation probe 1	14745	16.66071	213
IP2	HR2-L5M	Ionisation probe 2	14745	16.66725	145
IP3	HR2-L5U	Ionisation probe 3	14745	16.68083	88
IP4	HR3-R1L	Ionisation probe 4	15140	16.66497	165
IP5	HR3-R1LM	Ionisation probe 5	15140	16.66447	166
IP6	HR3-R1M	Ionisation probe 6	15140	16.66762	159
IP7	HR3-R1U	Ionisation probe 7	15140	16.67478	145
IP8	HR3-L1U	Ionisation probe 8	15140	16.62861	
IP9	HE2-R1M	Ionisation probe 9	16090	16.66997	404
IP10	HR4-L1L	Ionisation probe 10	16985	16.67061	226
IP11	HR4-L1M	Ionisation probe 11	16985	16.68034	171
IP12	HR4-L1U	Ionisation probe 12	16985	16.69635	144
IP13	HR4-R1U	Ionisation probe 13	16985	16.70181	68
IP14	HR4-R3U	Ionisation probe 14	17575	16.70601	78
IP15	HR4-L5L	Ionisation probe 15	18165	16.67999	126
IP16	HR4-L5M	Ionisation probe 16	18165	16.69849	65
IP17	HR4-L5U	Ionisation probe 17	18165	16.74686	26
IP18	HR4-R5M	Ionisation probe 18	18165	16.71429	47
IP19	HR5-L2L	Ionisation probe 19	18775	16.70047	60
IP20	HR5-L2M	Ionisation probe 20	18775	16.70978	54
IP21	HR5-L2U	Ionisation probe 21	18775	16.69929	
IP22	HR5-R2U	Ionisation probe 22	18775	16.72450	65
IP23	HR6-L1M	Ionisation probe 23	19985	16.75215	29

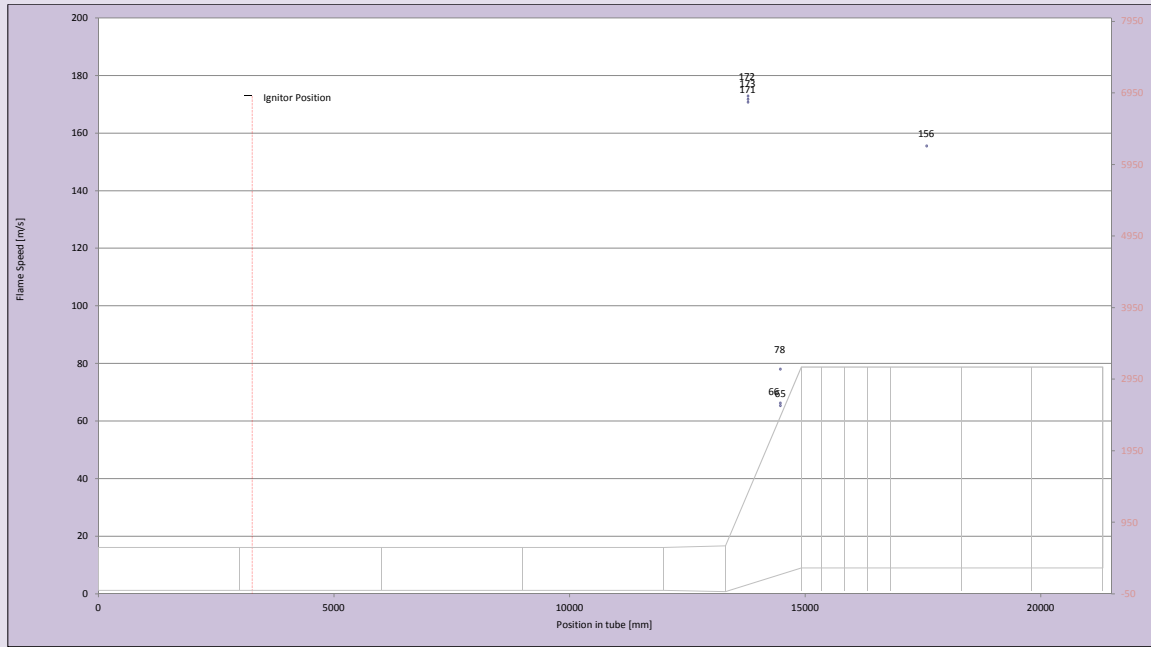
KEY: ND - not detected - sensor working but flame too weak to be picked up
 NW - not working - sensor not working



Location of igniter 3258 mm Time of ignition 16.59309 seconds

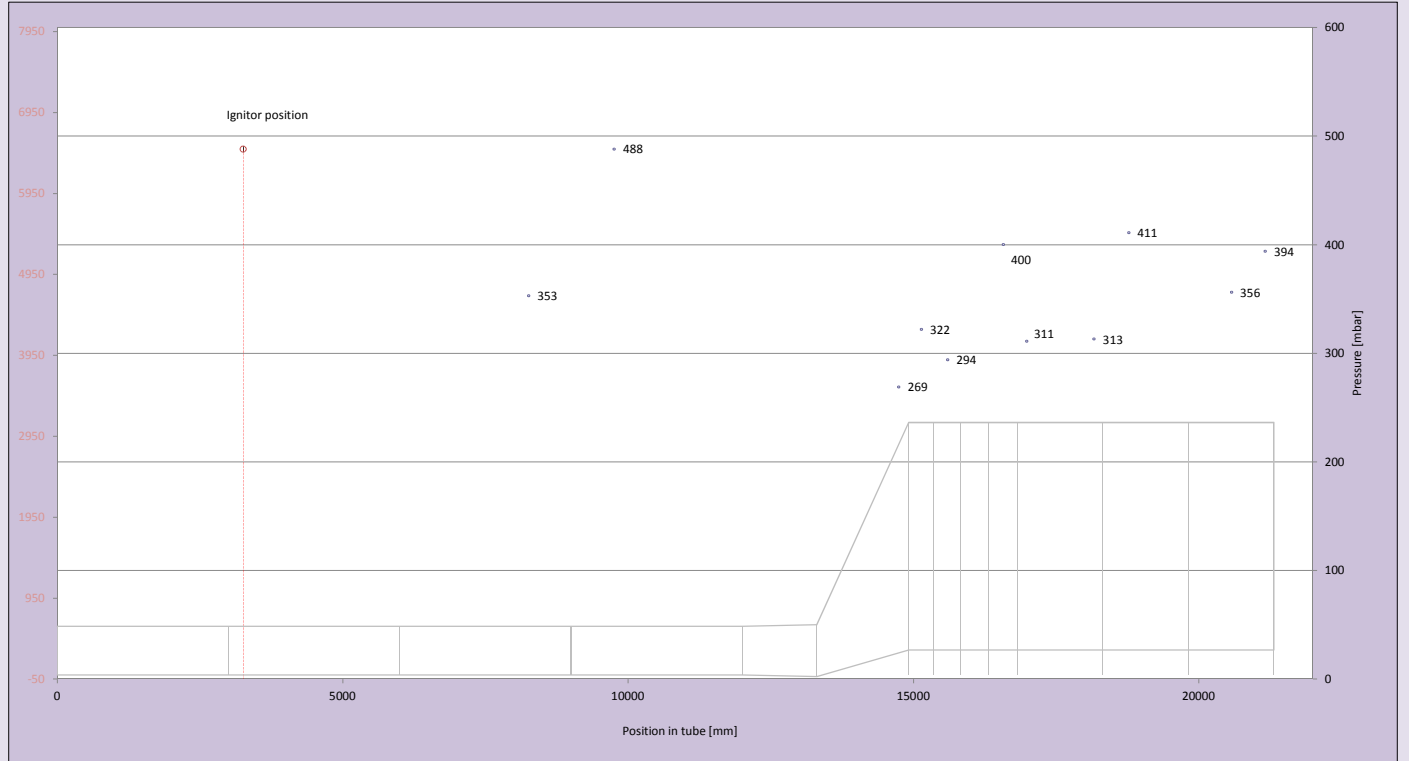
Rake Number	IP Number	Location label	Data Name	Position in tube (mm)	Flame arrival time (s)	Avg Flame speed from last sensor (m/s)
RA1	IP24	HR2-R2M	IP24	13785	16.6547	171
RA1	IP25	HR2-R2M	IP25	13785	16.6544	172
RA1	IP26	HR2-R2M	IP26	13785	16.6540	173
RA2	IP27	HR2-R4M	IP27	14475	16.6653	65
RA2	IP28	HR2-R4M	IP28	14475	16.6632	78
RA2	IP29	HR2-R4M	IP29	14475	16.6644	66
RA3	IP30	HR4-R3M	IP30	17575	16.6888	
RA3	IP31	HR4-R3M	IP31	17575	NW	
RA3	IP32	HR4-R3M	IP32	17575	16.6863	
RA4	IP33	HR4-R3L	IP33	17575	16.6791	156
RA4	IP34	HR4-R3L	IP34	17575	NW	
RA4	IP35	HR4-R3L	IP35	17575	NW	

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



Location of igniter mm

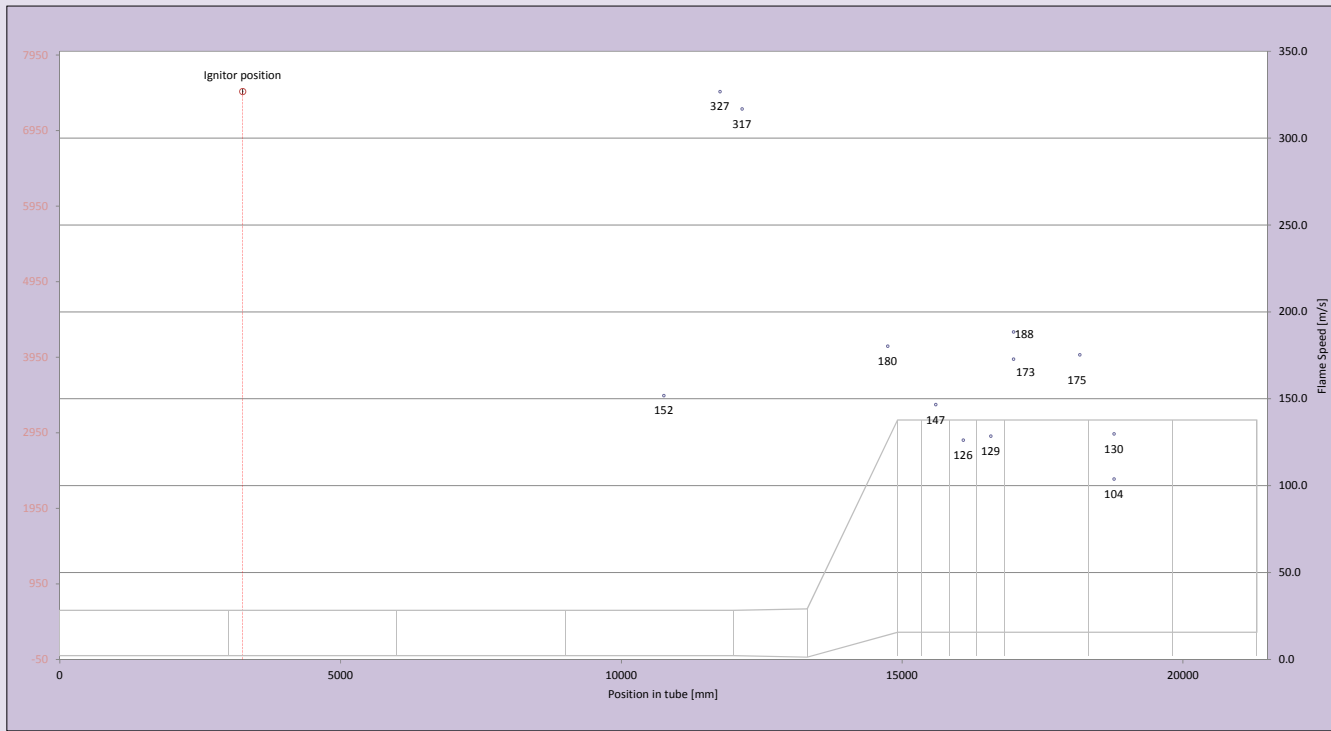
Transducer number	Location	Position in tube [mm]	ΔP_{max} [mbar]	Time ΔP_{max} [sec]
KU0	CD3-R5	8258	353	16.7016
KU1	CD4-R2	9758	488	16.6995
KU2	HR2-T5	14745	269	16.7006
KU3	HR3-L1L	15140	322	16.6987
KU4	HE1-R1U	15600	294	16.6724
KU5	HE3-R1L	16580	400	16.6973
KU6	HR4-R1L	16985	311	16.6950
KU7	HR4-R5U	18165	313	16.6912
KU8	HR5-R2L	18775	411	16.6863
KU9	HR6-R3L	20575	356	16.6836
KU10	HR6-L5L	21165	394	16.6834



Location of igniter mm Time of ignition seconds

OP Number	Location label	Position in tube (mm)	Flame arrival time (s)	Average flame speed (m/s)
OP0	CD4-L4	10758	16.6425	151.8
OP1	CD4-R6	11758	16.6455	326.8
OP2	HR1-R1	12152	16.6469	316.8
OP3	HR2-R5M	14745	16.6646	180.3
OP4	HE1-T1	15600	16.6755	146.6
OP5	HE2-T1	16090	16.6847	126.2
OP6	HE3-T1	16580	16.6878	128.5
OP7	HR4-T1	16985	16.6755	188.5
OP8	HR4-R1M	16985	16.6785	172.8
OP9	HR4-R5L	18165	16.6847	175.4
OP10	HR5-T2	18775	16.7042	129.8
OP11	HR5-R2M	18775	16.7197	103.8

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

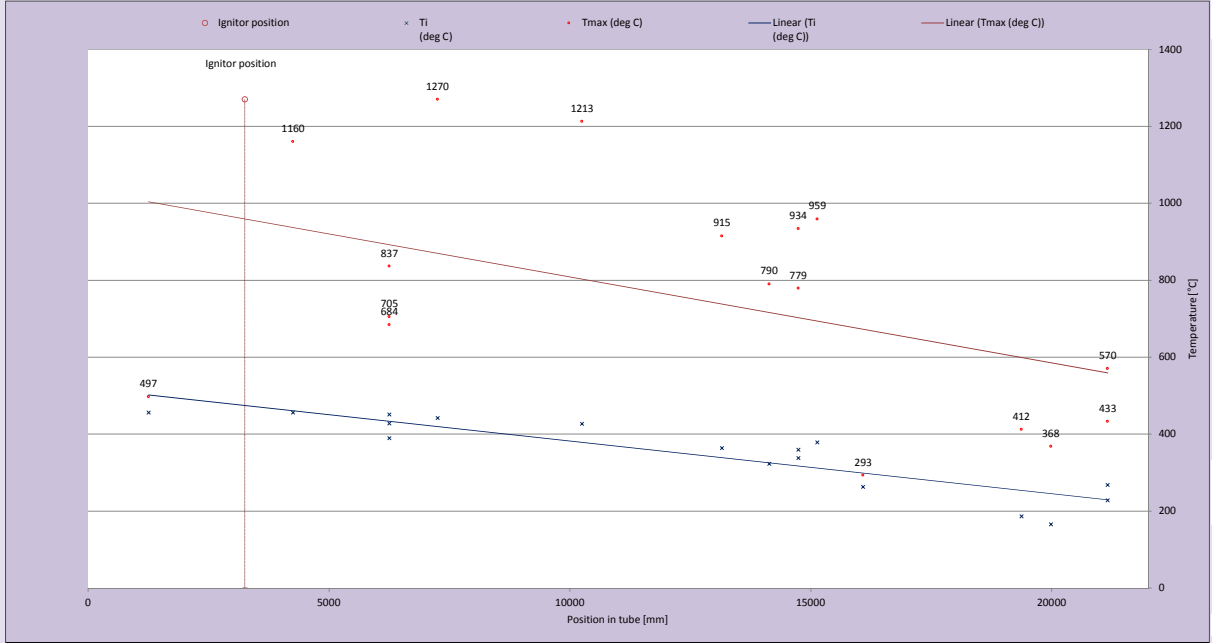


Location of igniter mm Time of ignition seconds

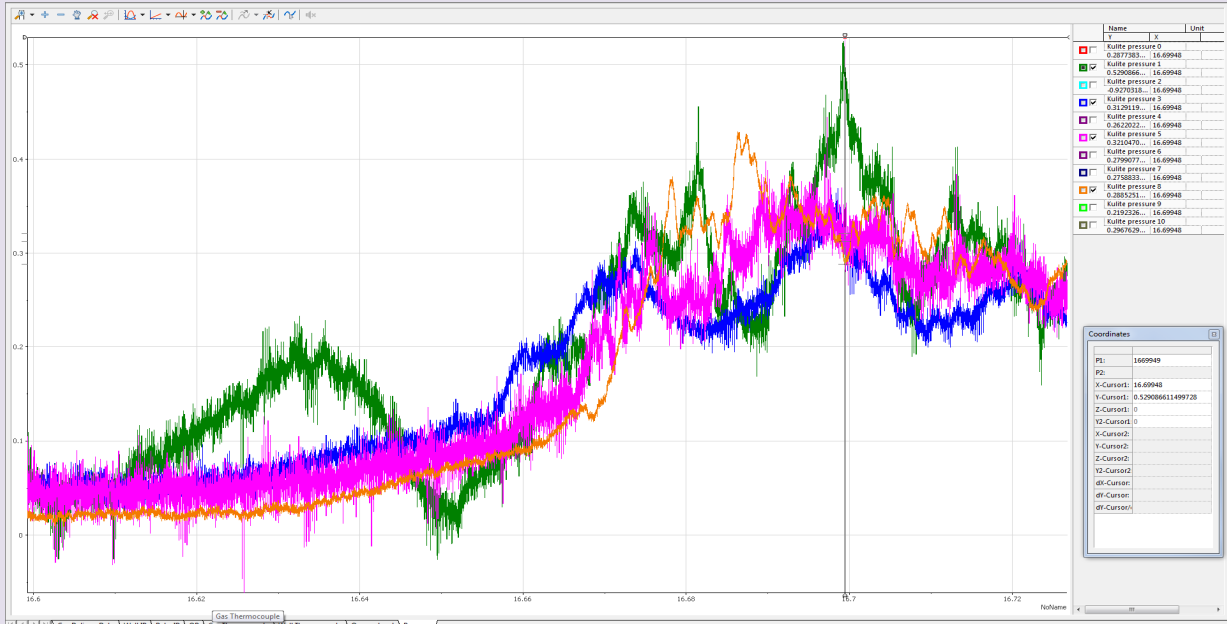
Thermocouple number	Location	Position in tube (mm)	Flame arrival time (s)	Average flame speed (m/s)	T _{max} (deg C)	T _i (deg C)
TC0	CD1-R3	1258			497	456
TC2	CD2-R3	4258	16.652	17	1160	456
TC4	CD3-R3	7258	16.600	624	1270	442
TC6	CD4-R3	10258	16.611	402	1213	427
TC8	HR1-R2	13160	16.628	288	915	364
TC12	CD3-T1	6258			837	390
TC13	CD3-L1	6258			705	428
TC14	CD3-B1	6258			684	451
TC15	CD3-R1	6258	NW			
TC16	HR2-R3M	14140	16.629	307	790	323
TC17	HR2-R5L	14745	16.634	284	934	360
TC18	HR2-R5U	14745	16.650	204	779	338
TC19	HR3-L1M	15140	16.648	218	959	379
TC20	HE2-R1L	16090	NW			
TC21	HE2-R1U	16090	16.652	220	293	263
TC22	HR5-R4M	19375	16.718	130	412	187
TC23	HR6-R1M	19985	16.765	98	368	166
TC24	HR6-R5L	21165	16.899	59	433	228
TC25	HR6-R5U	21165	16.884	62	570	268

surface thermocouples [not plotted]

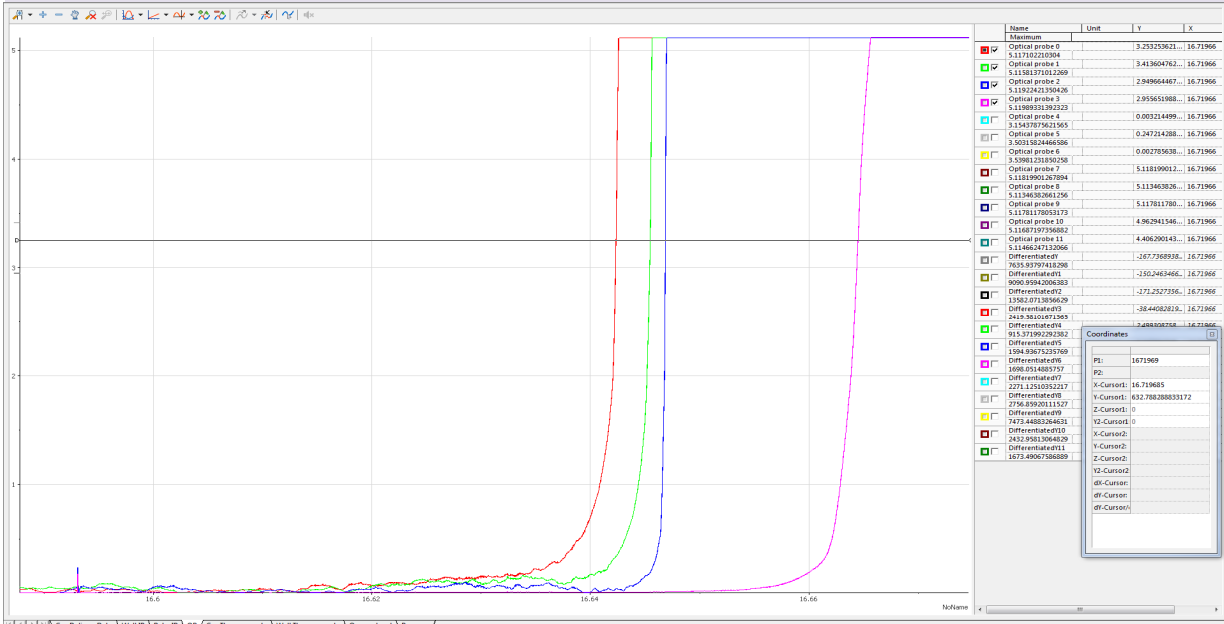
TC1	CD1-T2	1508			151	138
TC3	CD2-T2	4508			116	105
TC5	CD3-T2	7508			119	108
TC7	CD4-T2	10508			73	66



Pressure



Optical Probes



Name	Unit	Y	X
Optical probe 0		3.233753631...	16.71966
Optical probe 1		3.413604763...	16.71966
Optical probe 2		2.949644467...	16.71966
Optical probe 3		2.955651968...	16.71966
Optical probe 4		0.003214499...	16.71966
Optical probe 5		0.247147082...	16.71966
Optical probe 6		0.002785638...	16.71966
Optical probe 7		5.118190052...	16.71966
Optical probe 8		5.118630326...	16.71966
Optical probe 9		5.117811780...	16.71966
Optical probe 10		4.962941546...	16.71966
Optical probe 11		4.406200143...	16.71966
Differentiate d1		-1.077358938...	16.71966
Differentiate d2		-1.922446466...	16.71966
Differentiate d3		-1.772577356...	16.71966
Differentiate d4		-3.846026232...	16.71966
Differentiate d5		1.994367235769	
Differentiate d6		1.608214687977	
Differentiate d7		2.971255032417	
Differentiate d8		2.706492001127	
Differentiate d9		7473.4882546331	
Differentiate d10		2432.9911304829	
Differentiate d11		1673.4906758889	

Coordinates

PL: 1671969

PD: 1671965

V-Cursor1: 632.78828833172

Z-Cursor1: 0

V-Cursor2: 0

Z-Cursor2: 0

V-Cursor3: 0

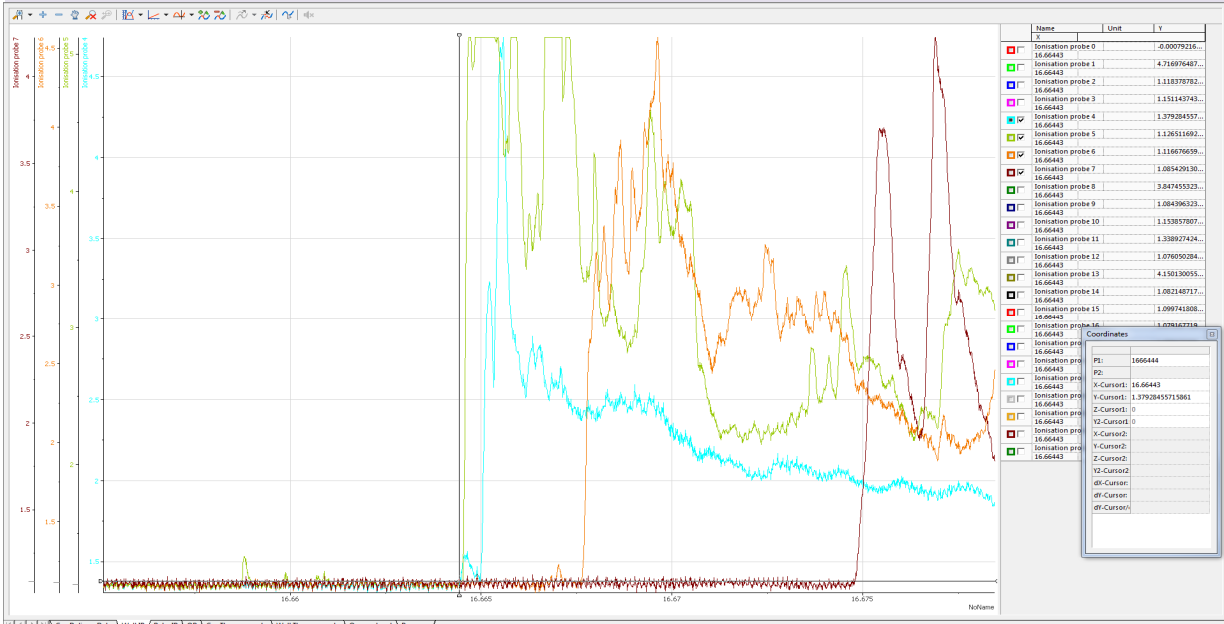
Z-Cursor3: 0

V-Cursor4: 0

Z-Cursor4: 0

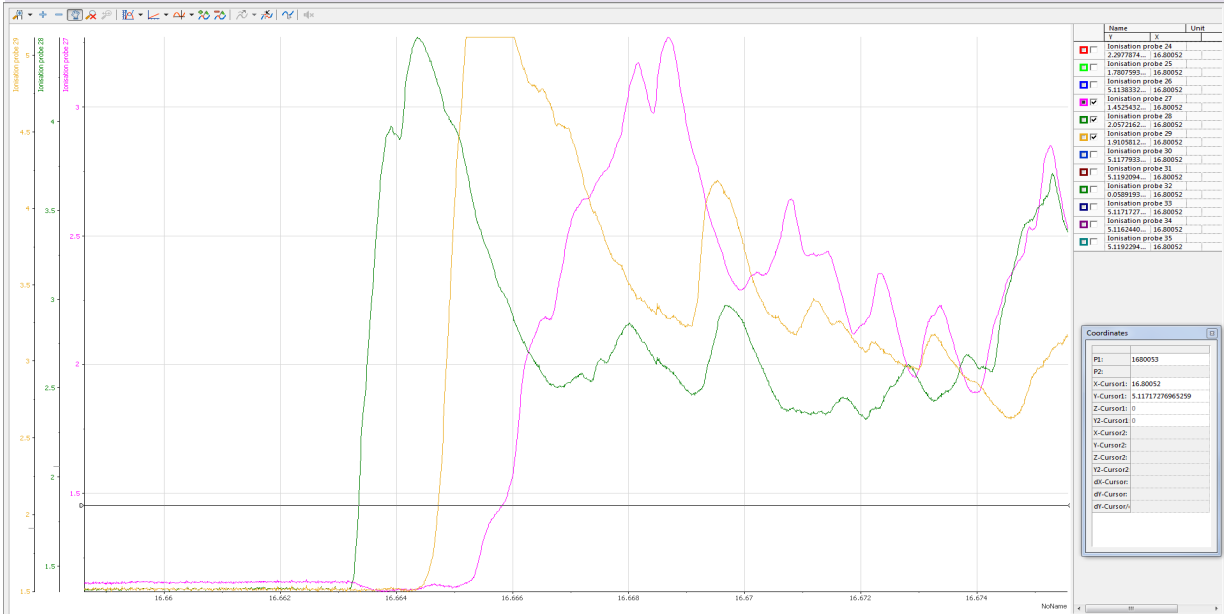
Gas Delivery Data \Wall P \Rake P \OP \Gas Thermocouple \Wall Thermocouple \Oxygen Level \Pressure /

Ionisation Probes



Name	Unit	Y
Ionisation probe 24	16.60052	2.2977874
Ionisation probe 25	16.60052	1.7957393
Ionisation probe 26	16.60052	1.1118332
Ionisation probe 27	16.60052	1.4212432
Ionisation probe 28	16.60052	2.0052162
Ionisation probe 29	16.60052	1.9105812
Ionisation probe 30	16.60052	1.1177932
Ionisation probe 31	16.60052	5.1192094
Ionisation probe 32	16.60052	0.0589193
Ionisation probe 33	16.60052	5.1171727
Ionisation probe 34	16.60052	5.1162440
Ionisation probe 35	16.60052	5.1192094

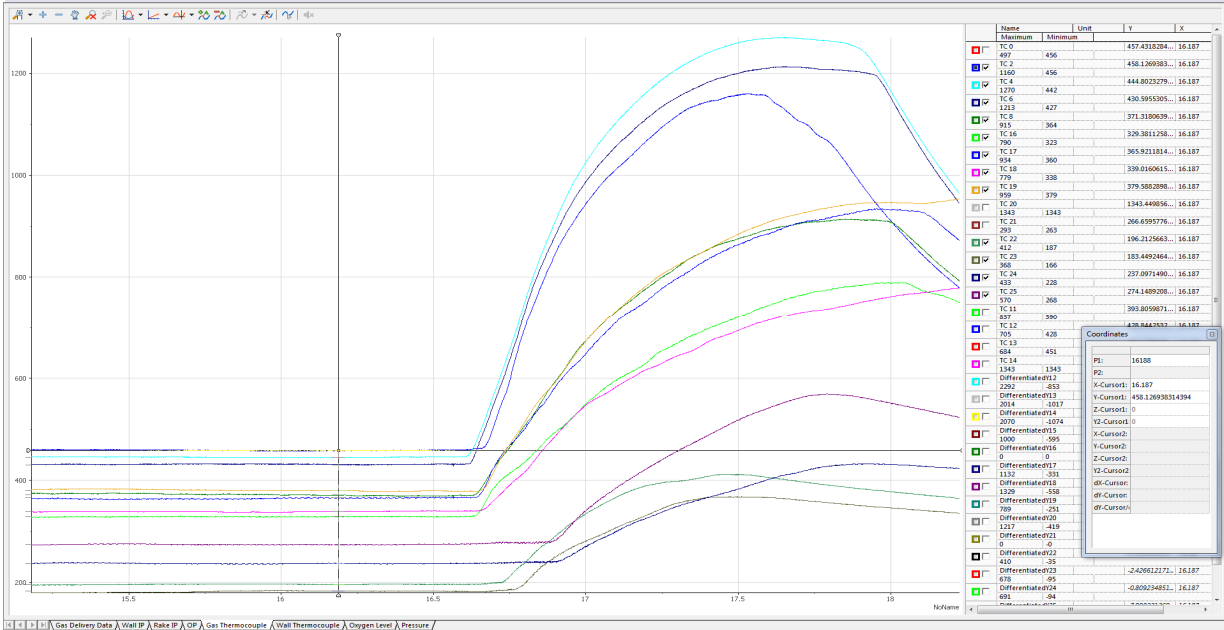
Gas Delivery Data \Wall IP \Rake IP \OP \Gas Thermocouple \Wall Thermocouple \Oxygen Level \Pressure /



Name	Unit	Y
Ionisation probe 24	16.60052	2.2977874
Ionisation probe 25	16.60052	1.7957393
Ionisation probe 26	16.60052	1.1118332
Ionisation probe 27	16.60052	1.4212432
Ionisation probe 28	16.60052	2.0052162
Ionisation probe 29	16.60052	1.9105812
Ionisation probe 30	16.60052	1.1177932
Ionisation probe 31	16.60052	5.1192094
Ionisation probe 32	16.60052	0.0589193
Ionisation probe 33	16.60052	5.1171727
Ionisation probe 34	16.60052	5.1162440
Ionisation probe 35	16.60052	5.1192094

Gas Delivery Data \Wall IP \Rake IP \OP \Gas Thermocouple \Wall Thermocouple \Oxygen Level \Pressure /

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
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

