

Date	06 March 2019
Time	11:59:49
Test Number	HRSG Test 58
Mixture Composition	40% CH4 60% H2
Ambient Temperature	7.8 °C
Ambient Pressure	937 mbar
Wind Speed	4.5m/s
Wind direction	S
Relative Humidity	98.00%
Mass Flow	9.4630 kg/s
Equivalence Ratio	0.51

**General Comments: (weather, rig configuration)**

Weather: Misty but cleared by time of test. Overcast.

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 40% CH4 60% H2 at an intended EQR of 0.5  
LOW TEMPERATURE TESTS (NOMINAL 320 oC).

Test gave a moderately weak combustion event with most sensors providing a good response.

**Ionisation Probes**

**Ionisation Rakes**

**Optical Probes**

Max overpressure  
182 mbar

Max. gas temperature  
1117 °C

Max. flame speed  
150 m/s

Max. flame speed  
112 m/s

Max. flame speed  
213 m/s

Initial gas temperature  
274 °C

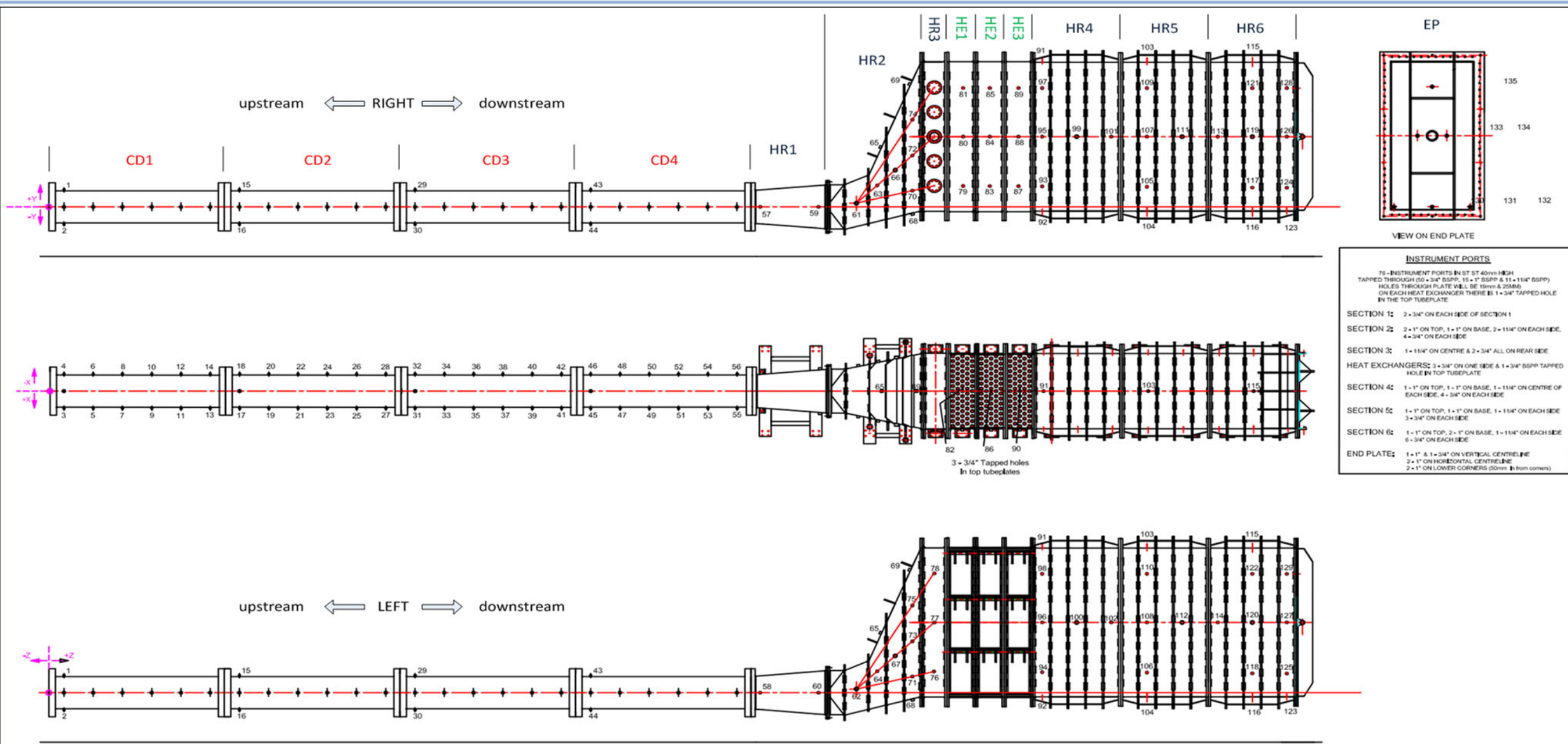
Location of Max. Overpressure  
sensor KU1  
label CD4-R2  
distance 9758 mm

Location of Max. Temperature  
sensor TC4  
label CD3-R3  
distance 7258 mm

Location of Max. Flame Speed  
sensor IP4  
label HR3-R1L  
distance 15140 mm

Location of Max. Flame Speed  
sensor RA1  
label HR2-R2M  
distance 13785 mm

Location of Max. Flame Speed  
sensor OP2  
label HR1-R1  
distance 12152 mm



**Naming Convention**

Section Identifier i.e. HE, HR, CD or EP	<b>HR 1 - R 1 U</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	Side i.e. R, L, T or B	Longitudinal position in section (numbered from 1)

**Key**

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

There are 13 sections on the rig

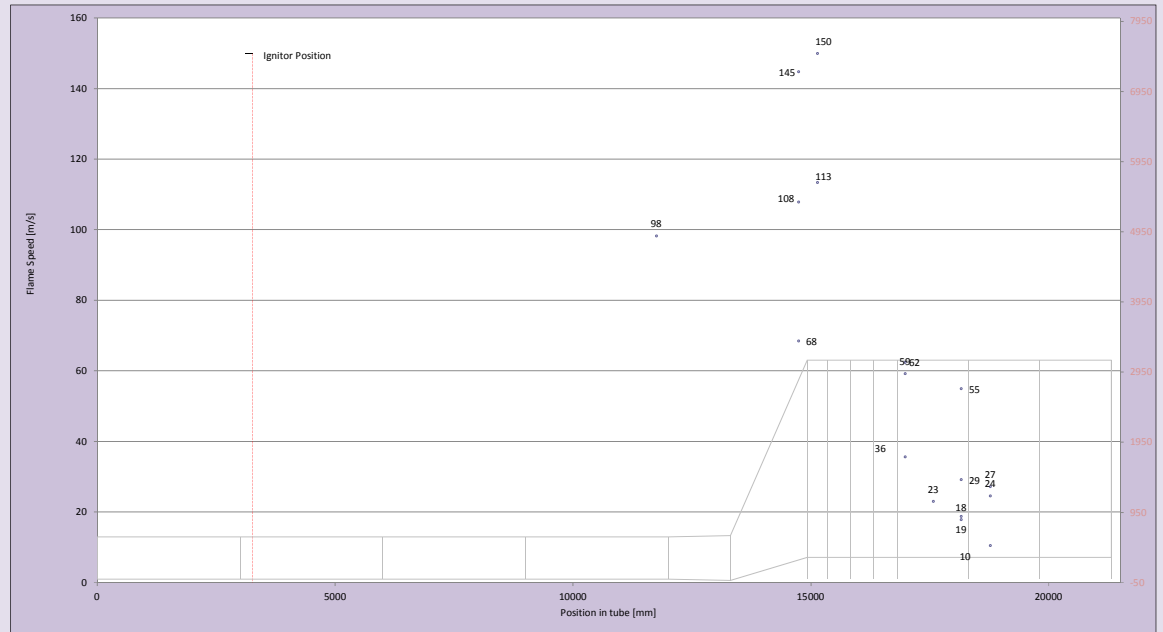
- 4 circular duct sections (CD1 to CD4)
- 6 HRSG sections (HR1 to HR6)
- 3 heat exchanger sections (HE1 to HE3) located between HR3 and HR4

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	23.71932	98
IP1	HR2-L5L	Ionisation probe 1	14745	23.73996	145
IP2	HR2-L5M	Ionisation probe 2	14745	23.74704	108
IP3	HR2-L5U	Ionisation probe 3	14745	23.76299	68
IP4	HR3-R1L	Ionisation probe 4	15140	23.74188	150
IP5	HR3-R1LM	Ionisation probe 5	15140	23.74917	113
IP6	HR3-R1M	Ionisation probe 6	15140		
IP7	HR3-R1U	Ionisation probe 7	15140	23.75700	
IP8	HR3-L1U	Ionisation probe 8	15140	23.77219	
IP9	HE2-R1M	Ionisation probe 9	16090	23.75619	
IP10	HR4-L1L	Ionisation probe 10	16985	23.76320	
IP11	HR4-L1M	Ionisation probe 11	16985	23.78296	62
IP12	HR4-L1U	Ionisation probe 12	16985	23.80339	59
IP13	HR4-R1U	Ionisation probe 13	16985	23.80883	36
IP14	HR4-R3U	Ionisation probe 14	17575	23.86298	23
IP15	HR4-L5L	Ionisation probe 15	18165	23.78471	55
IP16	HR4-L5M	Ionisation probe 16	18165	23.82349	29
IP17	HR4-L5U	Ionisation probe 17	18165	23.86656	19
IP18	HR4-R5M	Ionisation probe 18	18165	23.87274	18
IP19	HR5-L2L	Ionisation probe 19	18775	23.80718	27
IP20	HR5-L2M	Ionisation probe 20	18775	23.84839	24
IP21	HR5-L2U	Ionisation probe 21	18775	23.92474	10
IP22	HR5-R2U	Ionisation probe 22	18775		
IP23	HR6-L1M	Ionisation probe 23	19985		

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

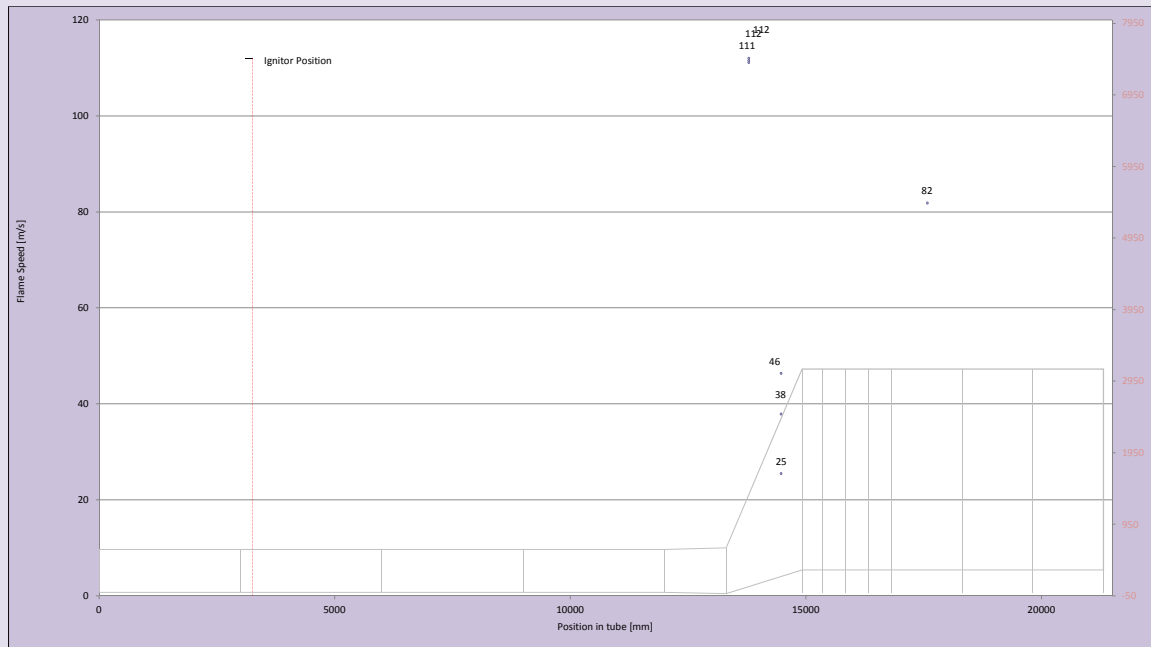
Most sensors did give a response to the combustion event.



Location of igniter 3258 mm Time of ignition 23.63276 seconds

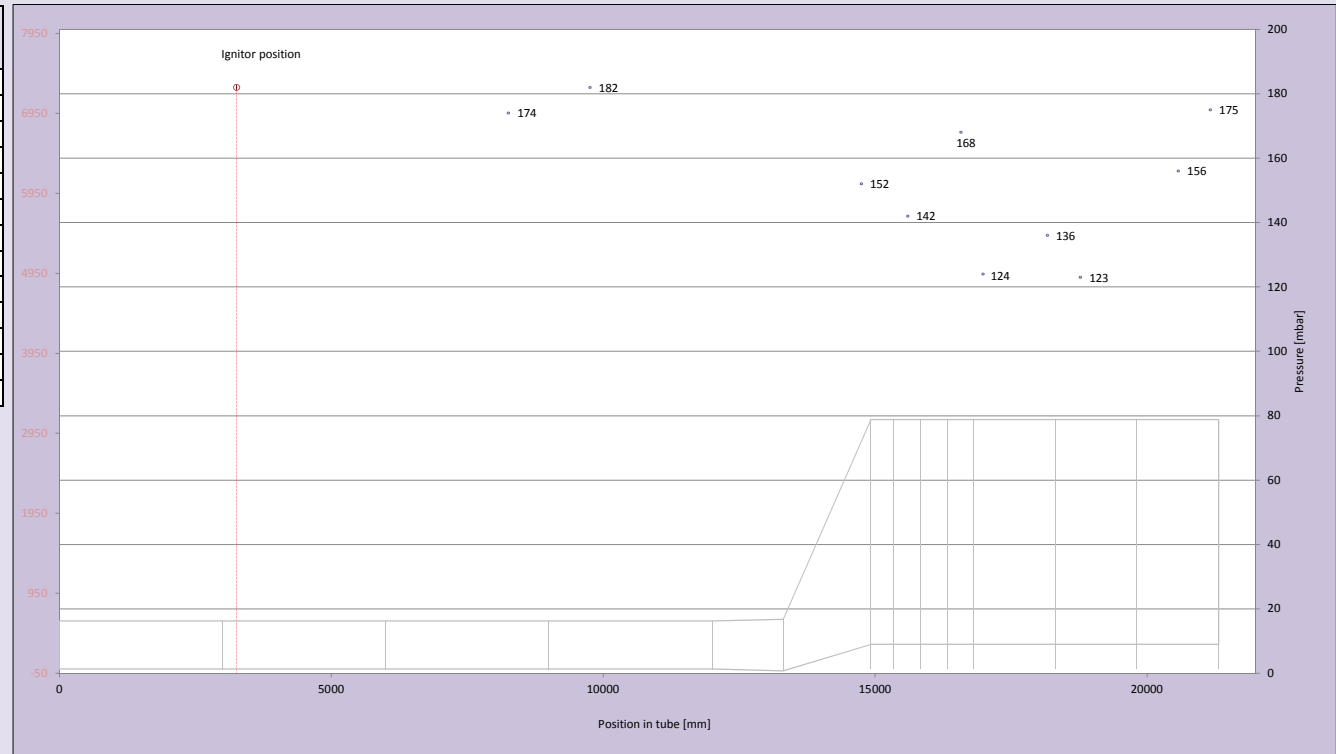
Rake Number	IP Number	Location label	Data Name	Position in tube (mm)	Flame arrival time (s)	Avg Flame speed from last sensor (m/s)
RA1	IP24	HR2-R2M	IP24	13785	23.7271	112
RA1	IP25	HR2-R2M	IP25	13785	23.7267	112
RA1	IP26	HR2-R2M	IP26	13785	23.7275	111
RA2	IP27	HR2-R4M	IP27	14475	23.7542	25
RA2	IP28	HR2-R4M	IP28	14475	23.7449	38
RA2	IP29	HR2-R4M	IP29	14475	23.7424	46
RA3	IP30	HR4-R3M	IP30	17575	NW	
RA3	IP31	HR4-R3M	IP31	17575	NW	
RA3	IP32	HR4-R3M	IP32	17575	NW	
RA4	IP33	HR4-R3L	IP33	17575	NW	
RA4	IP34	HR4-R3L	IP34	17575	23.7828	82
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

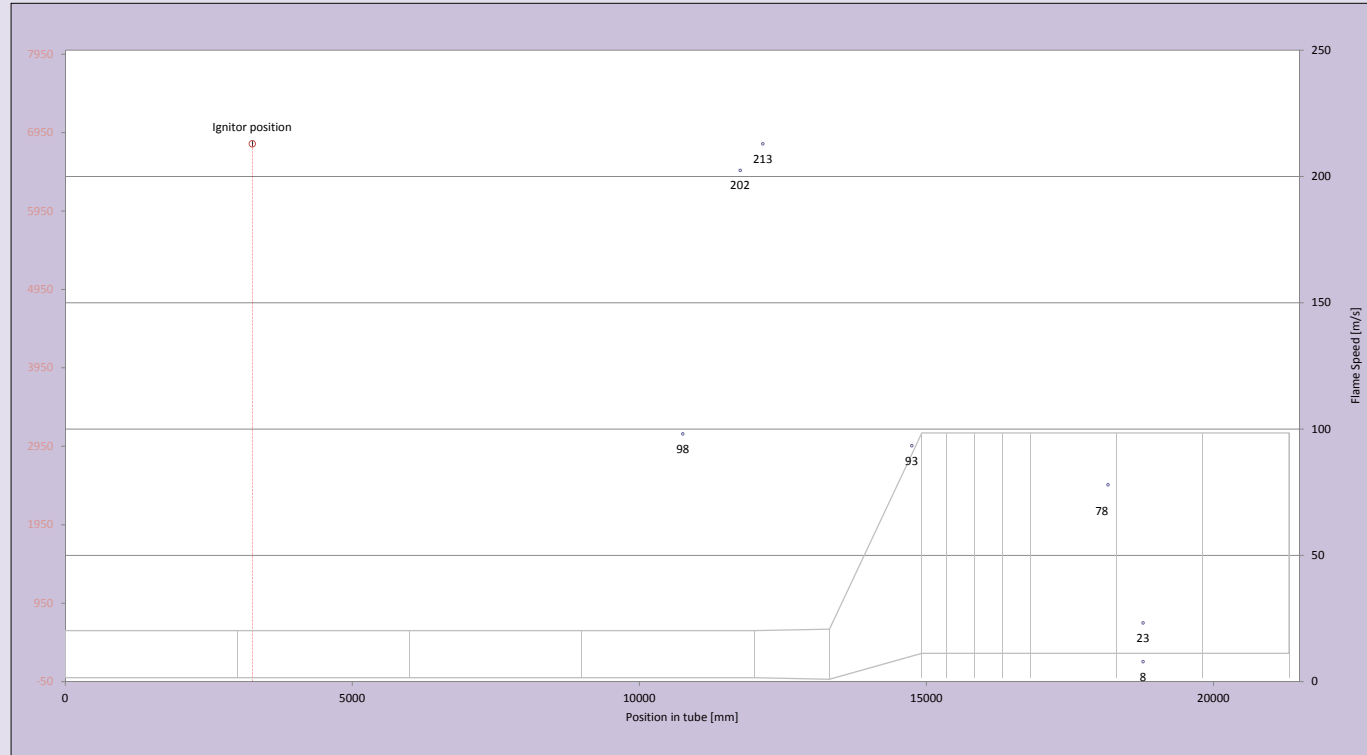
Transducer number	Location	Position in tube [mm]	$\Delta P_{max}$ [mbar]	Time $\Delta P_{max}$ [sec]
KU0	CD3-R5	8258	174	23.7881
KU1	CD4-R2	9758	182	23.7545
KU2	HR2-T5	14745	152	23.7542
KU3	HR3-L1L	15140		
KU4	HE1-R1U	15600	142	23.7529
KU5	HE3-R1L	16580	168	23.7790
KU6	HR4-R1L	16985	124	23.8005
KU7	HR4-R5U	18165	136	23.8035
KU8	HR5-R2L	18775	123	23.7901
KU9	HR6-R3L	20575	156	23.7943
KU10	HR6-L5L	21165	175	23.7923



Location of igniter  mm Time of ignitio  seconds

OP Number	Location label	Position in tube (mm)	Flame arrival time (s)	Average flame speed (m/s)
OP0	CD4-L4	10758	23.7092	98
OP1	CD4-R6	11758	23.7142	202
OP2	HR1-R1	12152	23.7160	213
OP3	HR2-R5M	14745	23.7438	93
OP4	HE1-T1	15600	23.7884	
OP5	HE2-T1	16090	23.7811	
OP6	HE3-T1	16580	23.8114	
OP7	HR4-T1	16985	23.8046	
OP8	HR4-R1M	16985	23.7892	
OP9	HR4-R5L	18165	23.7876	78
OP10	HR5-T2	18775	23.8139	23
OP11	HR5-R2M	18775	23.8647	8

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

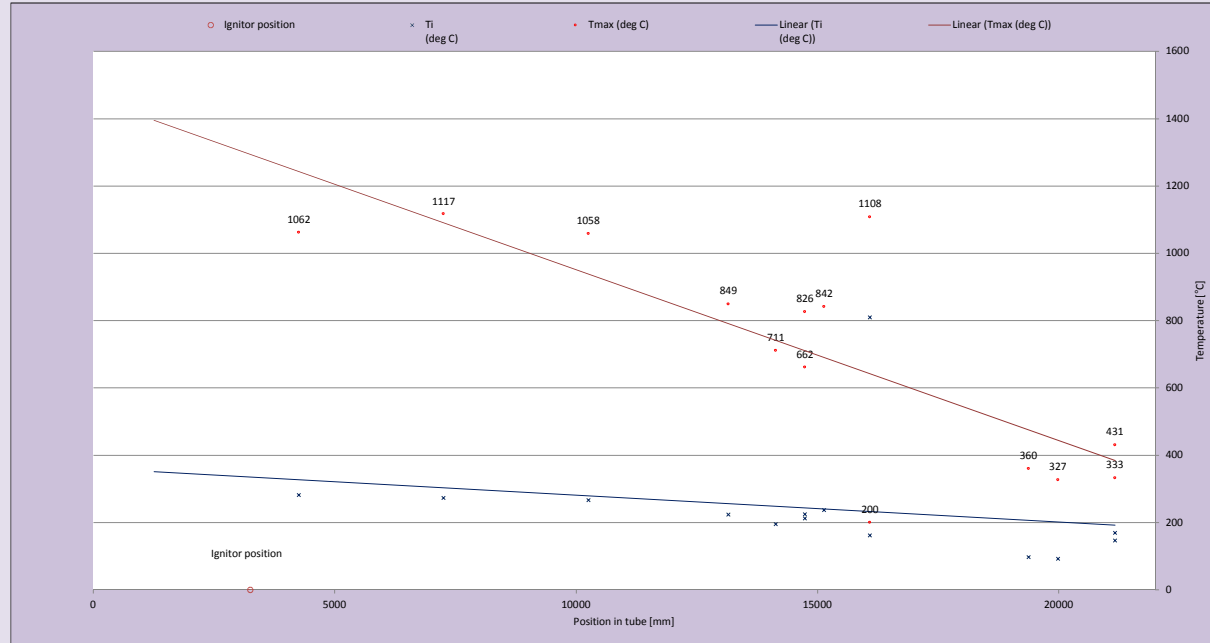


Location of igniter  mm      Time of ignition  seconds

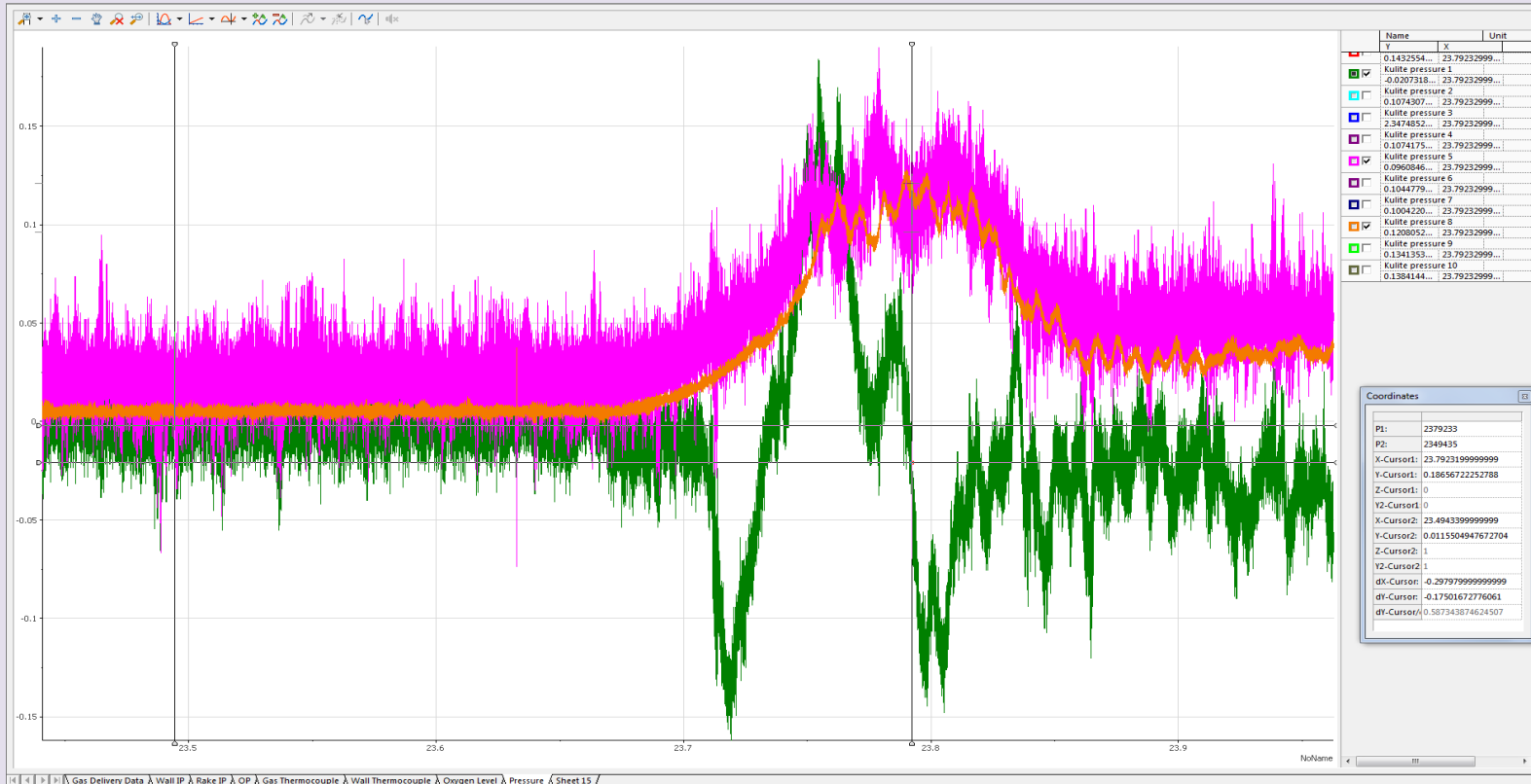
Thermocouple number	Location	Position in tube (mm)	T <sub>max</sub> (deg C)	T <sub>i</sub> (deg C)
TC0	CD1-R3	1258		
TC2	CD2-R3	4258	1062	282
TC4	CD3-R3	7258	1117	274
TC6	CD4-R3	10258	1058	267
TC8	HR1-R2	13160	849	224
TC12	CD3-T1	6258	452	263
TC13	CD3-L1	6258	451	275
TC14	CD3-B1	6258		
TC15	CD3-R1	6258	444	287
TC16	HR2-R3M	14140	711	196
TC17	HR2-R5L	14745	826	225
TC18	HR2-R5U	14745	662	213
TC19	HR3-L1M	15140	842	237
TC20	HE2-R1L	16090	1108	810
TC21	HE2-R1U	16090	200	162
TC22	HR5-R4M	19375	360	98
TC23	HR6-R1M	19985	327	93
TC24	HR6-R5L	21165	333	147
TC25	HR6-R5U	21165	431	170

surface thermocouples [not plotted]

TC1	CD1-T2	1508	82	73
TC3	CD2-T2	4508	67	58
TC5	CD3-T2	7508	65	56
TC7	CD4-T2	10508	43	38

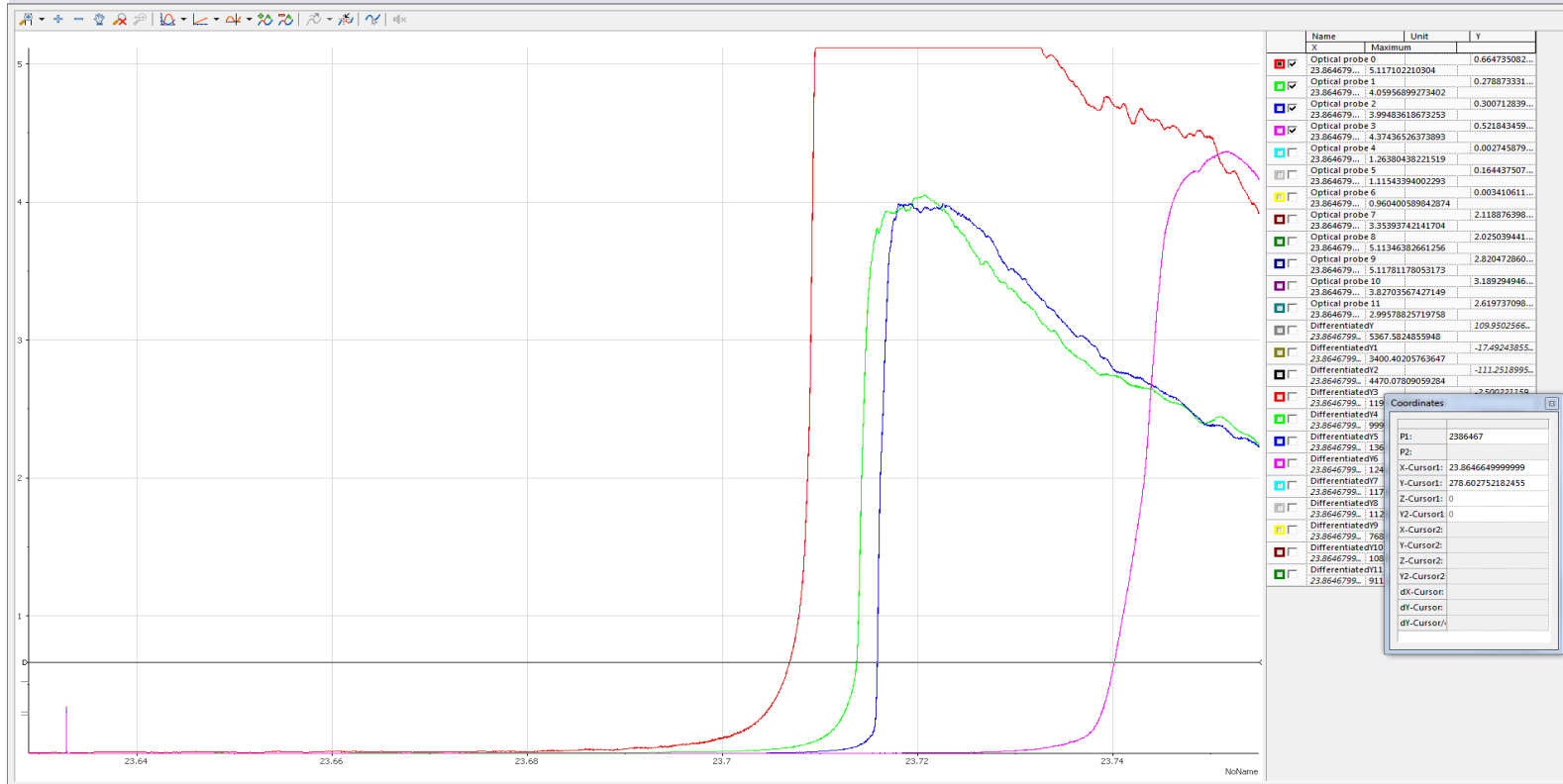


# Pressure





# Optical Probes



**Coordinates**

P1: 2386467

P2:

X-Cursor1: 23.86466499999999

V-Cursor1: 278.602752182455

Z-Cursor1: 0

V2-Cursor1: 0

X-Cursor2:

V-Cursor2:

Z-Cursor2:

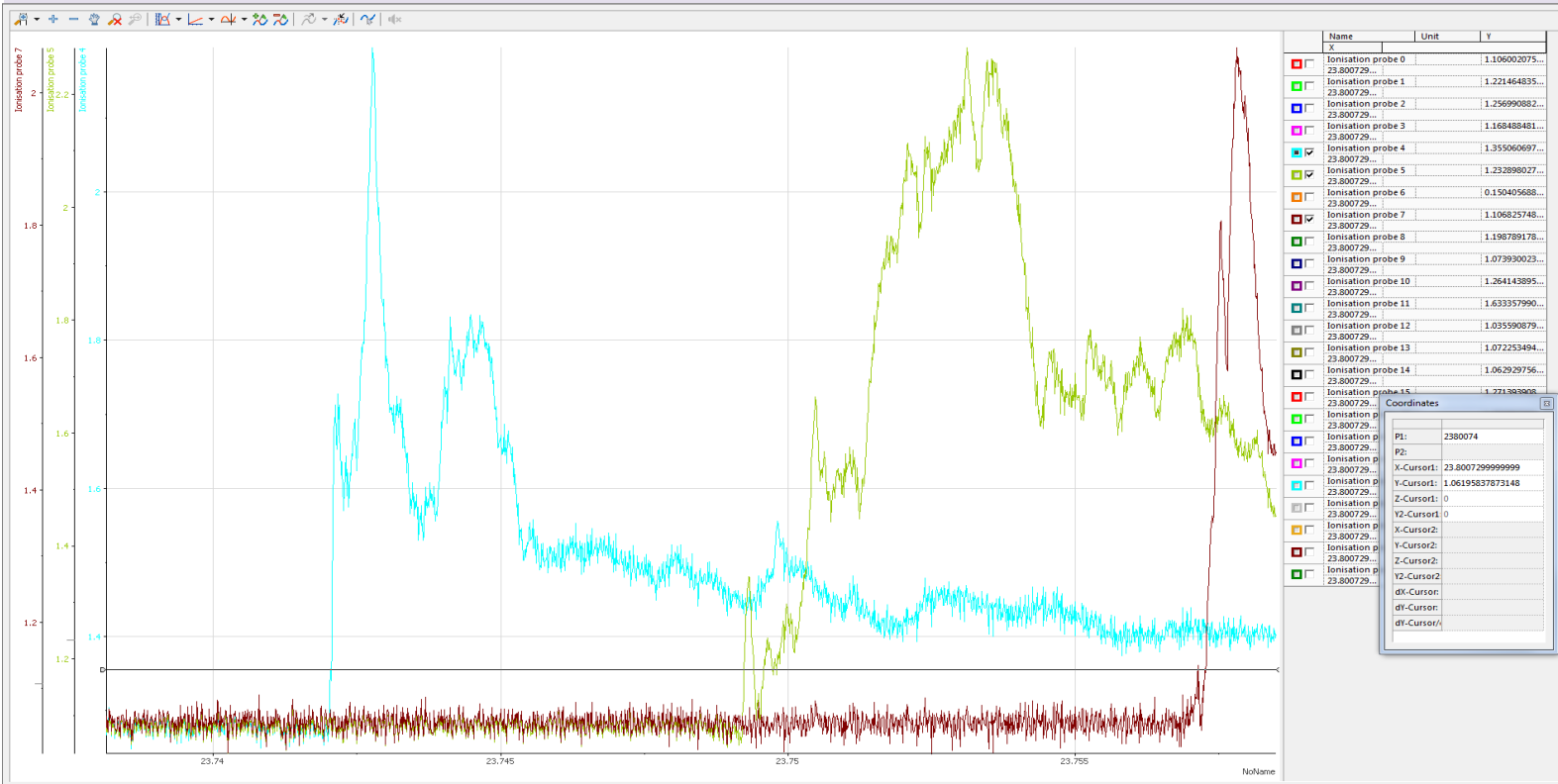
V2-Cursor2:

dx-Cursor:

dy-Cursor:

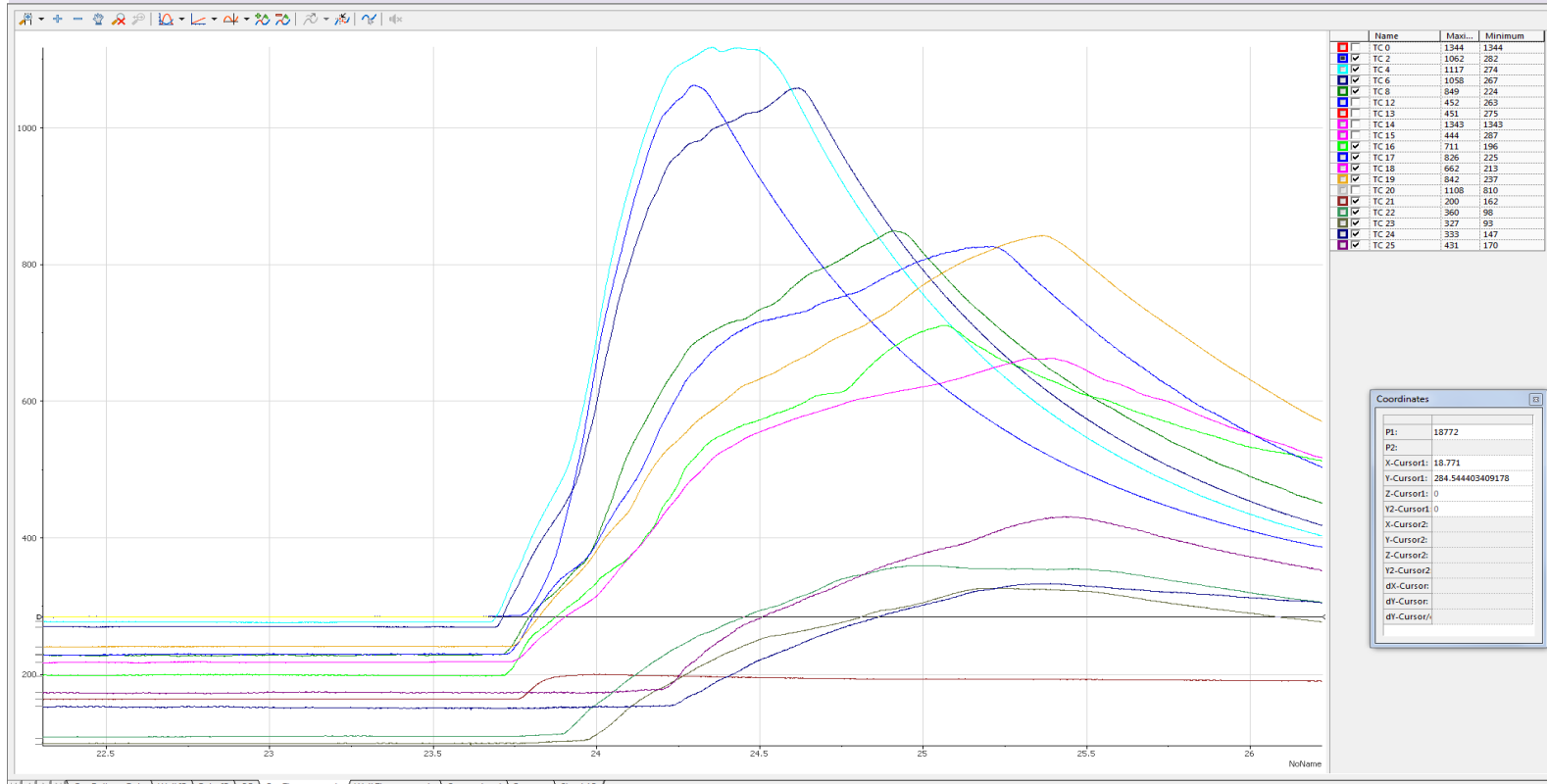
df-Cursor/:

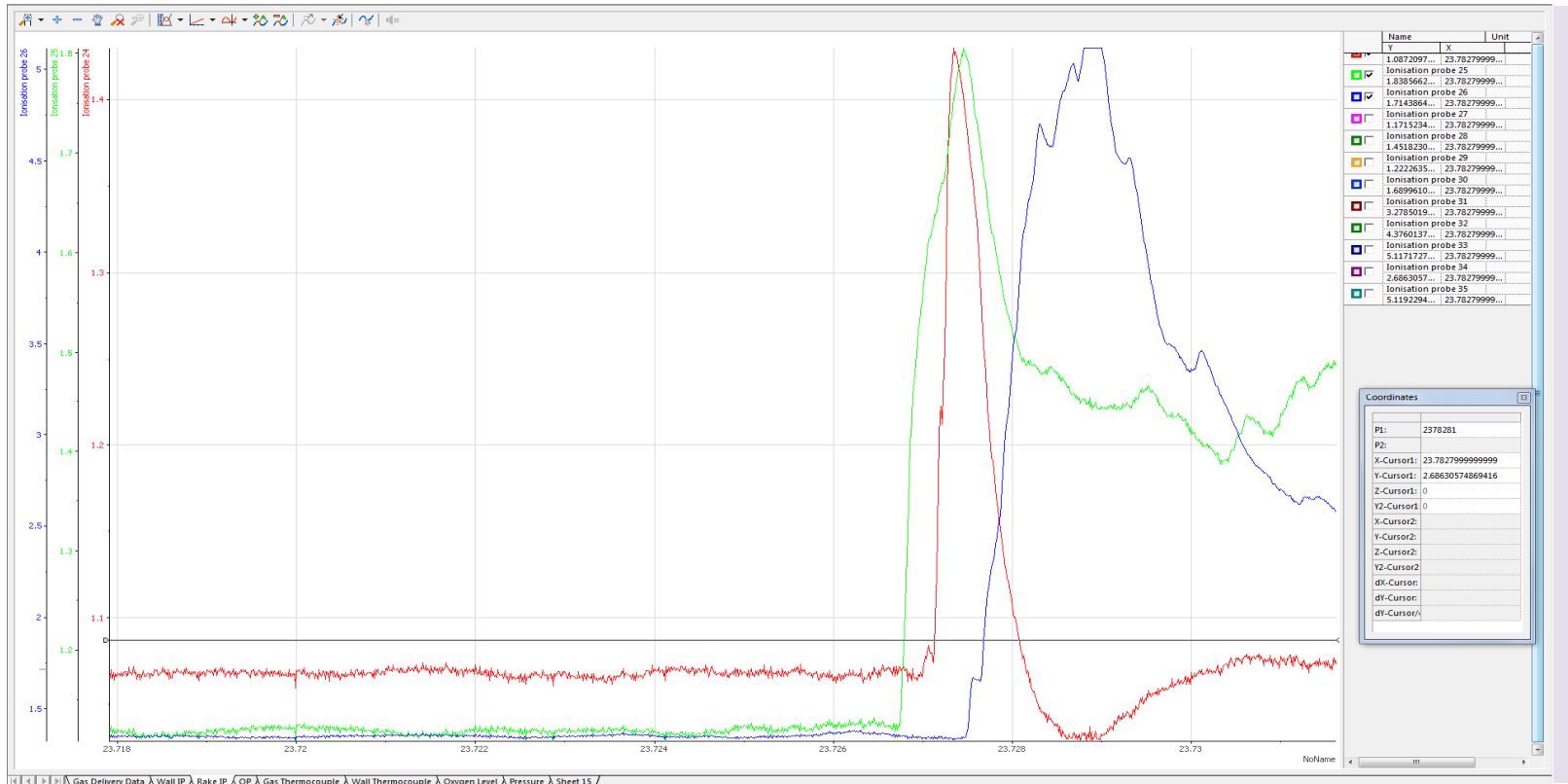
# Ionisation Probes



Coordinates	
P1:	2380074
P2:	
X-Cursor1:	23.8007299999999
Y-Cursor1:	1.06195837873148
Z-Cursor1:	0
V2-Cursor1:	0
X-Cursor2:	
Y-Cursor2:	
Z-Cursor2:	
V2-Cursor2:	
dX-Cursor:	
dY-Cursor:	
dZ-Cursor:	

# Temperature





Name	Y	X	Unit
Ionisation probe 25	1.0872097...	23.78279999...	
Ionisation probe 26	1.8385662...	23.78279999...	
Ionisation probe 27	1.7143864...	23.78279999...	
Ionisation probe 28	1.1715234...	23.78279999...	
Ionisation probe 29	1.4518230...	23.78279999...	
Ionisation probe 30	1.2224635...	23.78279999...	
Ionisation probe 31	1.6899610...	23.78279999...	
Ionisation probe 32	3.2785019...	23.78279999...	
Ionisation probe 33	4.3760137...	23.78279999...	
Ionisation probe 34	5.1171727...	23.78279999...	
Ionisation probe 35	2.6863057...	23.78279999...	
Ionisation probe 36	5.1192294...	23.78279999...	

Coordinates	
P1:	2378281
P2:	
X-Cursor1:	23.7827999999999
Y-Cursor1:	2.68630574869416
Z-Cursor1:	0
V2-Cursor1:	0
X-Cursor2:	
Y-Cursor2:	
Z-Cursor2:	
V2-Cursor2:	
dX-Cursor:	
dY-Cursor:	
dZ-Cursor:	

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

