

SIZING TABLES

Jones Stephens sizing tables reflect the real pressure drop of the pipe and fittings. Sizing must be done in accordance with NFPA 54 (National Fuel Gas Code), using both the TUBES and the FITTINGS sizing tables: using the pressure losses from both the PIPE and the FITTINGS sizing tables :this allows a more accurate sizing of the system for your installation.

Natural Gas <2psi

Working Conditions		
Natural gas	-	-
Inlet Pressure	6" WC	-
Pressure drop	0.300	WC [inch]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Natural Gas [ft ³ /h]			
5	97	206	370	737
10	67	142	254	506
15	54	114	204	407
20	46	97	175	348
25	41	86	155	308
30	37	78	140	279
40	31	67	120	239
50	28	59	107	212
60	25	54	97	192
70	23	49	89	177
80	22	46	83	164
90	20	43	78	154
100	19	41	73	146
150	15	33	59	117
200	13	28	50	100
250	12	25	45	89
300	11	23	40	80
350	10	21	37	74
400	9	19	35	69
450	8	18	32	65
500	8	17	31	61

SIZING TABLES

Natural Gas <2psi

Working Conditions		
Natural gas	-	-
Inlet Pressure	6-7" WC	-
Pressure drop	0.500	WC [inch]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Natural Gas [ft ³ /h]			
5	128	272	488	971
10	88	187	335	668
15	71	150	269	536
20	60	128	231	459
25	54	114	204	407
30	48	103	185	368
40	41	88	158	315
50	37	78	140	279
60	33	71	127	253
70	31	65	117	233
80	29	61	109	217
90	27	57	102	203
100	25	54	97	192
150	20	43	78	154
200	17	37	66	132
250	15	33	59	117
300	14	30	53	106
350	13	27	49	98
400	12	25	46	91
450	11	24	43	85
500	11	23	40	80

SIZING TABLES

Natural Gas <2psi

Working Conditions		
Natural gas	-	-
Inlet Pressure	8" WC	-
Pressure drop	3.000	WC [inch]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Natural Gas [ft³/h]			
5	337	717	1287	2560
10	232	492	884	1760
15	186	395	710	1413
20	159	338	608	1209
25	141	300	539	1072
30	128	272	488	971
40	109	233	418	831
50	97	206	370	737
60	88	187	335	668
70	81	172	309	614
80	75	160	287	571
90	71	150	269	536
100	67	142	254	506
150	54	114	204	407
200	46	97	175	348
250	41	86	155	308
300	37	78	140	279
350	34	72	129	257
400	31	67	120	239
450	30	63	113	224
500	28	59	107	212

-sizing tables

Natural Gas <2psi

Working Conditions		
Natural gas	-	-
Inlet Pressure	12-14" WC	-
Pressure drop	6.000	WC [inch]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Natural Gas [ft³/h]			
5	490	1043	1872	3725
10	337	717	1287	2560
15	271	575	1033	2056
20	232	492	884	1760
25	205	436	784	1560
30	186	395	710	1413
40	159	338	608	1209
50	141	300	539	1072
60	128	272	488	971
70	118	250	449	894
80	109	233	418	831
90	103	218	392	780
100	97	206	370	737
150	78	166	297	592
200	67	142	254	506
250	59	126	226	449
300	54	114	204	407
350	49	105	188	374
400	46	97	175	348
450	43	91	164	327
500	41	86	155	308

SIZING TABLES

Natural Gas 2psi - 1psi

Working Conditions		
Natural gas	-	-
Inlet Pressure	2.000	[Psi]
Pressure Drop	1.000	[Psi]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Natural Gas [ft ³ /h]			
5	1180	2510	4506	8968
10	811	1725	3097	6164
15	651	1385	2487	4950
20	557	1186	2129	4236
25	494	1051	1887	3754
30	448	952	1709	3402
40	383	815	1463	2912
50	340	722	1297	2580
60	308	654	1175	2338
70	283	602	1081	2151
80	263	560	1006	2001
90	247	525	943	1878
100	233	496	891	1774
150	187	399	716	1424
200	160	341	612	1219
250	142	302	543	1080
300	129	274	492	979
350	118	252	453	901
400	110	234	421	838
450	103	220	395	786
500	98	208	373	742

SIZING TABLES

Natural Gas 5psi - 3.5psi

Working Conditions		
Natural gas	-	-
Inlet Pressure	5.000	[Psi]
Pressure Drop	3.500	[Psi]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Natural Gas [ft ³ /h]			
5	2457	5225	9381	18670
10	1688	3591	6448	12832
15	1356	2884	5178	10304
20	1160	2468	4431	8819
25	1029	2187	3928	7816
30	932	1982	3559	7082
40	798	1696	3046	6061
50	707	1503	2699	5372
60	640	1362	2446	4867
70	589	1253	2250	4478
80	548	1166	2093	4166
90	514	1094	1964	3909
100	486	1033	1855	3692
150	390	830	1490	2965
200	334	710	1275	2538
250	296	629	1130	2249
300	268	570	1024	2038
350	247	525	942	1875
400	229	488	876	1744
450	215	458	822	1636
500	203	433	777	1546

SIZING TABLES

LP Gas (Propane) <2psi

Working Conditions		
Propane	-	-
Inlet Pressure	11	WC [inch]
Pressure Drop	0.500	WC [inch]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Propane [ft ³ /h]			
5	208	443	795	1583
10	143	304	547	1088
15	115	244	439	874
20	98	209	376	748
25	87	185	333	663
30	79	168	302	600
40	68	144	258	514
50	60	127	229	455
60	54	115	207	413
70	50	106	191	380
80	46	99	177	353
90	44	93	167	331
100	41	88	157	313
150	33	70	126	251
200	28	60	108	215
250	25	53	96	191
300	23	48	87	173
350	21	44	80	159
400	19	41	74	148
450	18	39	70	139
500	17	37	66	131

SIZING TABLES

LP Gas (Propane) 2psi -1 psi

Working Conditions		
Propane	-	-
Inlet Pressure	2.000	[Psi]
Pressure Drop	1.000	[Psi]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Propane [ft ³ /h]			
5	1915	4072	7312	14551
10	1316	2799	5025	10001
15	1057	2247	4035	8031
20	904	1924	3454	6873
25	802	1705	3061	6092
30	726	1545	2774	5520
40	622	1322	2374	4724
50	551	1172	2104	4187
60	499	1062	1906	3794
70	459	977	1754	3490
80	427	909	1631	3247
90	401	853	1531	3046
100	379	805	1446	2878
150	304	647	1161	2311
200	260	553	994	1978
250	231	491	881	1753
300	209	444	798	1588
350	192	409	734	1461
400	179	380	683	1359
450	168	357	641	1275
500	159	337	605	1205

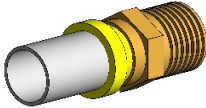
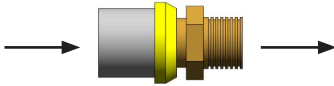
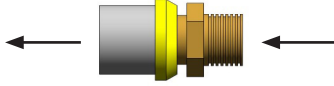
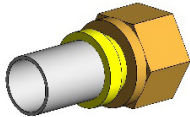
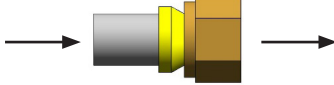
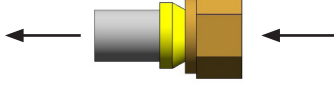
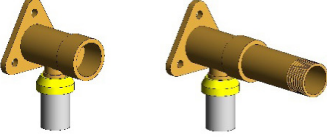
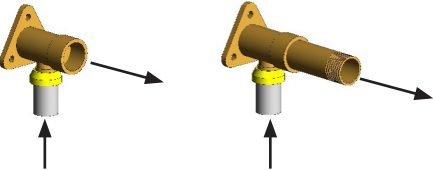
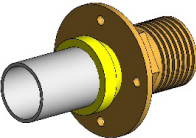
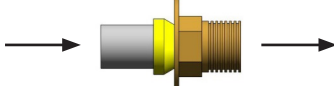
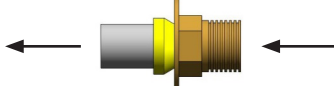
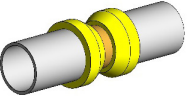
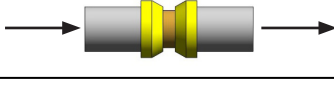
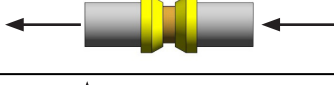
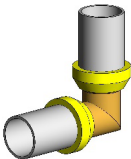
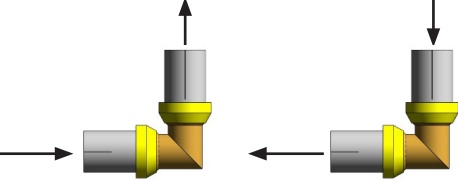
SIZING TABLES

LP Gas (Propane) 5psi -3.5 psi

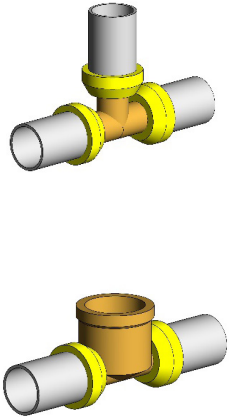
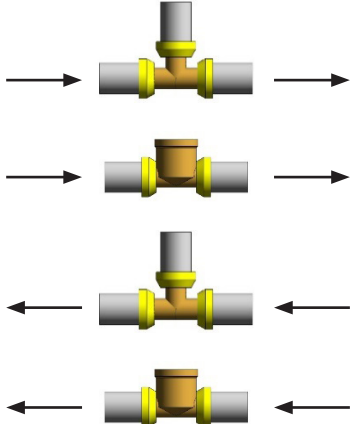
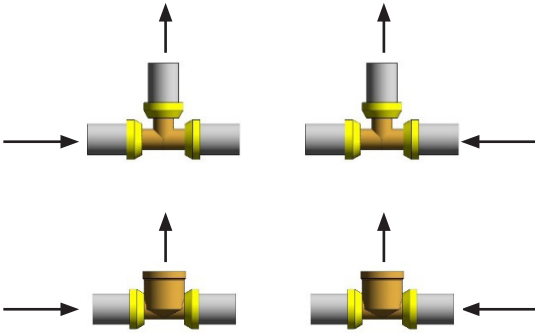
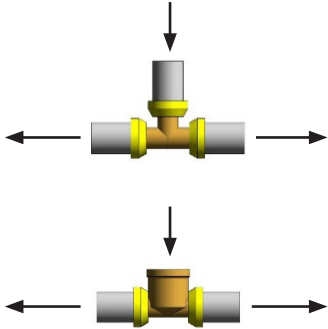
Working Conditions		
Propane	-	-
Inlet Pressure	5.000	[Psi]
Pressure Drop	3.500	[Psi]

Imperial diam.	3/8"	1/2"	3/4"	1"
Pipe [mm]	16	20	26	32
Length [ft]	Flow Rate Propane [ft ³ /h]			
5	3986	8477	15221	30292
10	2740	5826	10462	20820
15	2200	4679	8401	16719
20	1883	4004	7190	14309
25	1669	3549	6373	12682
30	1512	3216	5774	11491
40	1294	2752	4942	9835
50	1147	2439	4380	8716
60	1039	2210	3968	7898
70	956	2033	3651	7266
80	889	1892	3396	6759
90	835	1775	3187	6342
100	788	1677	3010	5991
150	633	1346	2417	4811
200	542	1152	2069	4117
250	480	1021	1834	3649
300	435	925	1661	3306
350	400	851	1528	3042
400	372	792	1422	2830
450	349	743	1334	2655
500	330	702	1260	2508

SIZING TABLES

FITTINGS PRESSURE LOSSES IN EQUIVALENT PIPE LENGTH (ft)		
FITTING	FLOWRATE DIRECTION	VALUE
NPT Male Couplings 		3.28
		
NPT Female Couplings 		3.28
		
Wingback Elbows 		3.28
Floor/Wall Mountings 		3.28
		
Couplings 		1.03
		
Crimp & NPT Elbows 		2.26

SIZING TABLES

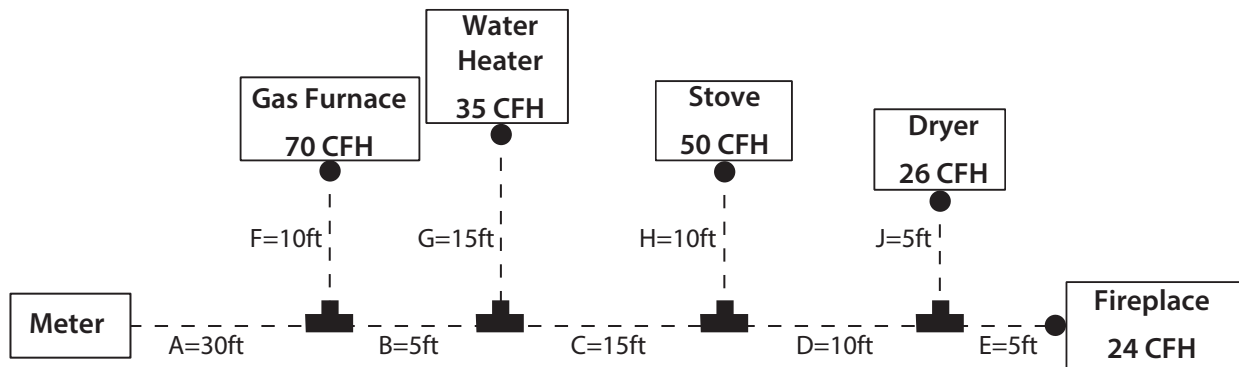
FITTINGS PRESSURE LOSSES IN EQUIVALENT PIPE LENGTH (ft)		
FITTING	FLOWRATE DIRECTION	VALUE
<p>Crimp & NPT tees</p> 		1.64
		4.51
		4.92

EXAMPLE NO. 1

This is a typical single-family house installation with five (5) appliances, where the design layout of gas supply piping system is arranged in series with a main run branching at the appliances. The utility company's supply pressure (downstream of the meter) is 8" WC, and the utility company advises that the specific gravity of the gas delivered will be 0.60 and the energy content is 1 CFH = 1,000 BTUH. The allowable pressure drop across the system has been determined to be 3.0" WC.

Appliances list:

- Gas Furnace (70,000 BTUH → 70 CFH)
- Water Heater (35,000 BTUH → 35 CFH)
- Stove (50,000 BTUH → 50 CFH)
- Dryer (26,000 BTUH → 26 CFH)
- Fireplace (24,000 BTUH → 24 CFH)



Trunks

TRUNKS SECTION	LOAD DELIVERED BY SECTION	SECTION LENGTH	MOST DISADVANTAGED APPLIANCE
A	205 CFH	30'	Dryer: - run length = 65' - run fittings: 3 straight tees, 1 tee 90° and 1 termination wingback elbow
B	135 CFH	5'	Dryer: - run length = 65' - run fittings: 3 straight tees, 1 tee 90° and 1 termination wingback elbow
C	100 CFH	15'	Dryer: - run length = 65' - run fittings: 3 straight tees, 1 tee 90° and 1 termination wingback elbow
D	50 CFH	10'	Dryer: - run length = 65' - run fittings: 3 straight tees, 1 tee 90° and 1 termination wingback elbow

Appliance Sections

APPLIANCE SECTION	APPLIANCE LOAD	TOTAL SECTION LENGTH	SECTION FITTINGS
E	24 CFH	65'	4 straight tees and 1 termination wingback elbow
F	70 CFH	40'	1 tee 90° and 1 termination wingback elbow
G	35 CFH	50'	1 straight tee, 1 tee 90° and 1 termination wingback elbow
H	50 CFH	60'	2 straight tees, 1 tee 90° and 1 termination wingback elbow
J	24 CFH	65'	3 straight tees, 1 tee 90° and 1 termination wingback elbow

Run Length for Trunk Sections = Distance from meter to most disadvantaged appliance depending on the system layout and the total section length (it means not just the furthest one but the one whose section has the highest value of pressure losses).

Total section length for Appliance Sections = Distance from meter to each appliance.

Sizing Run A: Utilize sizing table for natural gas at 8"WC + 3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 205 CFH
- most disadvantaged appliance: Dryer
 - run to it = 65'
 - additional fittings of it: 3 tees straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = $65 + 3 \times 1.64 + 4.51 + 3.28 = 77.71$ ➔ rounded up to 80

According to sizing table, Pipe size = 3/4in (26mm) (up to 287 CFH)

Sizing Run B: Utilize sizing table for natural gas at 8"WC + 3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 135 CFH
- most disadvantaged appliance: Dryer
 - run to it = 65'
 - additional fittings of it: 3 tees straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = $65 + 3 \times 1.64 + 4.51 + 3.28 = 77.71$ ➔ rounded up to 80

According to sizing table, Pipe size = 1/2in (20mm) (up to 160 CFH)

Sizing Run C: Utilize sizing table for natural gas at 8"WC + 3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 100 CFH
- most disadvantaged appliance: Dryer
 - run to it = 65'
 - additional fittings of it: 3 tees straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = $65 + 3 \times 1.64 + 4.51 + 3.28 = 77.71$ ➔ rounded up to 80

According to sizing table, Pipe size = 1/2in (20mm) (up to 160 CFH)

Sizing Run D: Utilize sizing table for natural gas at 8"WC + 3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 50 CFH
- most disadvantaged appliance: Dryer
 - run to it = 65'
 - additional fittings of it: 3 tees straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = $65 + 3 \times 1.64 + 4.51 + 3.28 = 77.71$ ➔ rounded up to 80

According to sizing table, Pipe size = 3/8in (16mm) (up to 75 CFH)

Sizing Run E: Utilize sizing table for natural gas at 8"WC + 3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 24 CFH
- run to relative appliance = 65'
- additional fittings of the run: 4 tees straight + 1 termination wingback elbow

➔ total run = $65 + 4 \times 1.64 + 3.28 = 74.84$ ➔ rounded up to 80

According to sizing table, Pipe size = 3/8 in (16mm) (up to 75 CFH)

Sizing Run F: Utilize sizing table for natural gas at 8"WC + 3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 70 CFH
- run to relative appliance = 40'
- additional fittings of the run: 1 tee 90° + 1 termination wingback elbow

➔ total run = $40 + 4.51 + 3.28 = 47.89$ ➔ rounded up to 50

According to sizing table, Pipe size = 3/8in (16mm) (up to 97 CFH)

Sizing Run G: Utilize sizing table for natural gas at 8" WC + 3" WC pressure drop + the table of the fittings pressure losses.

- Total Load = 35 CFH
- run to relative appliance = 50'
- additional fittings of the run: 1 tee straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = 50 + 1.64 + 4.51 + 3.28 = 59.43 ➔ rounded up to 60

According to sizing table, Pipe size = 3/8in (16mm) (up to 88 CFH)

Sizing Run H: Utilize sizing table for natural gas at 8" WC + 3" WC pressure drop + the table of the fittings pressure losses.

- Total Load = 50 CFH
- run to relative appliance = 60'
- additional fittings of the run: 2 tees straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = 60 + 2*1.64 + 4.51 + 3.28 = 71.07 ➔ rounded up to 80

According to sizing table, Pipe size = 3/8in (16mm)m (up to 75 CFH)

Sizing Run J: Utilize sizing table for natural gas at 8" WC + 3" WC pressure drop + the table of the fittings pressure losses.

- Total Load = 26 CFH
- run to relative appliance = 65'
- additional fittings of the run: 3 tee straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = 65 + 3*1.64 + 4.51 + 3.28 = 77.71 ➔ rounded up to 80

According to sizing table, Pipe size = 3/8in (16mm) (up to 75 CFH)

Below are the sizes of the gas supply system:

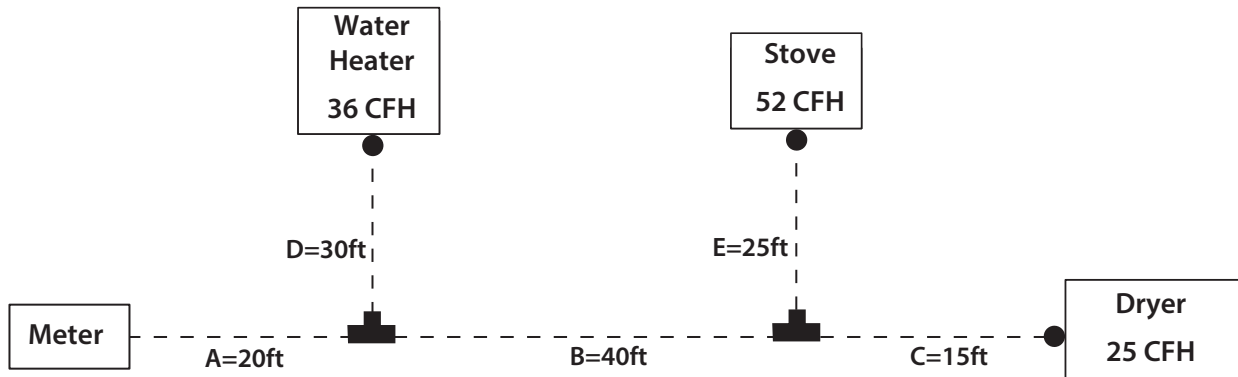
SECTION	PIPE SIZE (MM)	PIPE SIZE (IN)
A	26	3/4
B	20	1/2
C	20	1/2
D	16	3/8
E	16	3/8
F	16	3/8
G	16	3/8
H	16	3/8
J	16	3/8

EXAMPLE NO. 2

This is a typical small single-family house installation with three (3) appliances, where the design layout of gas supply piping system is arranged in series with a main run branching at the appliances. The utility company’s supply pressure (downstream of the meter) is 6" WC, and the utility company advises that the specific gravity of the gas delivered will be 0.60 and the energy content is 1 CFH = 1.000 BTUH. The allowable pressure drop across the system has been determined to be 0.3" WC.

Appliances list:

- Water Heater (36,000 BTUH → 36 CFH)
- Stove (52,000 BTUH → 52 CFH)
- Dryer (25,000 BTUH → 25 CFH)



Trunks

TRUNKS SECTION	LOAD DELIVERED BY SECTION	SECTION LENGTH	MOST DISADVANTAGED APPLIANCE
A	113 CFH	20'	Stove: - run length = 85' - run fittings: 1 straight tee, 1 tee 90° and 1 termination wingback elbow
B	77 CFH	40'	Stove: - run length = 85' - run fittings: 1 straight tee, 1 tee 90° and 1 termination wingback elbow

Appliance Sections

APPLIANCE SECTION	APPLIANCE LOAD	TOTAL SECTION LENGTH	SECTION FITTINGS
C	25 CFH	75'	2 tees and 1 termination wingback elbow
D	36 CFH	50'	1 tee and 1 termination wingback elbow
E	52 CFH	85'	2 tees and 1 termination wingback elbow

Run Length for Trunk Sections = Distance from meter to most disadvantaged appliance depending on the system layout and the total section length (it means not just the furthest one but the one whose section has the highest value of pressure losses)

Total section length for Appliance Sections = Distance from meter to each appliance

Sizing Run A: Utilize sizing table for natural gas at 6"WC + 0.3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 113 CFH
- most disadvantaged appliance: Stove
 - run to it = 85'
 - additional fittings of it: 1 tee straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = 85 + 1.64 + 4.51 + 3.28 = 94.43 ➔ rounded up to 100

According to sizing table, Pipe size = 1in (32mm) (up to 146 CFH)

Sizing Run B: Utilize sizing table for natural gas at 6"WC + 0.3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 77 CFH
- most disadvantaged appliance: Stove
 - run to it = 85'
 - additional fittings of it: 1 tee straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = 85 + 1.64 + 4.51 + 3.28 = 94.43 ➔ rounded up to 100

According to sizing table, Pipe size = 1in (32mm) (up to 146 CFH)

Sizing Run C: Utilize sizing table for natural gas at 6"WC + 0.3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 25 CFH
- run to relative appliance = 75'
- additional fittings of the run: 2 tees straight + 1 termination wingback elbow

➔ total run = 75 + 2*1.64 + 3.28 = 81.56 ➔ rounded up to 90

According to sizing table, Pipe size = 1/2in (20mm) (up to 43 CFH)

Sizing Run D: Utilize sizing table for natural gas at 6"WC + 0.3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 36 CFH
- run to relative appliance = 50'
- additional fittings of the run: 1 tee 90° + 1 termination wingback elbow

➔ total run = 50 + 4.51 + 3.28 = 57.79 ➔ rounded up to 60

According to sizing table, Pipe size = 1/2in (20mm (up to 54 CFH)

Sizing Run E: Utilize sizing table for natural gas at 6"WC + 0.3"WC pressure drop + the table of the fittings pressure losses.

- Total Load = 52 CFH
- run to relative appliance = 85'
- additional fittings of the run: 1 tee straight + 1 tee 90° + 1 termination wingback elbow

➔ total run = 85 + 1.64 + 4.51 + 3.28 = 94.43 ➔ rounded up to 100

According to sizing table, Pipe size = 3/4in (26mm) (up to 73 CFH)

Below are the sizes of the gas supply system:

SECTION	PIPE SIZE (MM)	PIPE SIZE (IN)
A	32	1
B	32	1
C	20	1/2
D	20	1/2
E	26	3/4