



Natural Gas Reference Guide

NICOR GAS NATURAL GAS REFERENCE GUIDE
A guide to industry code specifications and guidelines

Always check your local building code department to ensure correctness of information and that all projects are within proper building code specifications.

In the event of a natural gas emergency contact Nicor Gas immediately at 1-888-Nicor4u (642-6748) or your local fire department.

Call us at 1-888-Nicor4u (642-6748) for:

- 1 Additional copies of the guide, ext. 2821
- 1 Questions concerning information within this guide, ext. 64-2079

Or if you're calling for natural gas service for new construction,
1-800-GAS-6228

Visit us on our web site at www.nicorinc.com.

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**APPROXIMATE GAS INPUT OF GAS APPLIANCES
IN CUBIC FEET PER HOUR**

<u>Appliances</u>	<u>Input</u>
Domestic Gas Range	65
Storage Water Heater - 30 Gallon	45
Storage Water Heater - 40-50 Gallon	55
Instantaneous Water Heater	
2 Gallon Min. Capacity:	143
4 Gallon	285
6 Gallon	428
Steam Boiler - per Horsepower (Commercial)	50
Restaurant Range	
4 Top Burners - 2 Ovens .	150
6 Top Burners - 2-4 Ovens	240
Clothes Dryers	26
Grills	35
Yard Lights	2
Air Conditioning	Per nameplate rating
Pool Heater	or manufacturer's
Gas Logs and Log Lighters	recommendations

GAS APPLIANCE INPUT TABLE
APPROXIMATE GAS INPUT OF GAS APPLIANCES
IN CUBIC FEET PER HOUR

Appliances

Input

Space Heating Equipment
(Conversion Burners)

Pipe size according to
anticipated load.
Burner must never be
adjusted to exceed burner
rating.

Space Heating Equipment
(Gas Designed)

Per Nameplate rating
or manufacturer's
recommendations.

**METER TIMING TABLE FOR GAS INPUTS
AT LOW PRESSURE METERING
GAS RATE CUBIC FEET PER HOUR**

Seconds For One Revolution	Size of Test Dial			
	1/2 cu. ft.	1 cu. ft.	2 cu. ft.	5 cu. ft.
10	180	360	720	1,800
11	164	327	655	1,636
12	150	300	600	1,500
13	138	277	555	1,385
14	129	257	514	1,286
15	120	240	480	1,200
16	113	225	450	1,125
17	106	212	424	1,059
18	100	200	400	1,000
19	95	189	379	947
20	90	180	360	900
21	86	171	343	857
22	82	164	327	818
23	78	157	313	783
24	75	150	300	750
25	72	144	288	720
26	69	138	277	692
27	67	133	267	667
28	64	129	257	643
29	62	124	248	621
30	60	120	240	600

**METER TIMING TABLE FOR GAS INPUTS
AT LOW PRESSURE METERING
GAS RATE CUBIC FEET PER HOUR**

Seconds For One Revolution	Size of Test Dial			
	<u>1/2 cu. ft.</u>	<u>1 cu. ft.</u>	<u>2 cu. ft.</u>	<u>5 cu. ft.</u>
31	58	116	232	581
32	56	113	225	563
33	54	109	218	545
34	53	106	212	529
35	51	103	206	514
36	50	100	200	500
37	48	97	195	486
38	47	95	189	474
39	46	92	185	462
40	45	90	180	450
41	44	88	176	439
42	43	86	172	429
43	42	84	167	419
44	41	82	164	409
45	40	80	160	400
46	39	78	157	391
47	38	76	153	383
48	37	75	150	373
49			147	367
50	36	72	144	360
51			141	353

**METER TIMING TABLE FOR GAS INPUTS
AT LOW PRESSURE METERING
GAS RATE CUBIC FEET PER HOUR**

Seconds For One Revolution	Size of Test Dial			
	<u>1/2 cu. ft.</u>	<u>1 cu. ft.</u>	<u>2 cu. ft.</u>	<u>5 cu. ft.</u>
52			138	346
53	34	68	136	340
54			133	333
55			131	327
56	32	64	128	320
57			126	316
58	31	62	124	310
59			122	305
60	30	60	120	300
61			118	295
62	29	58	116	290
63.2			114	285
64.2	28	56	112	280
65.4			110	275
66.6	27	54	108	270
67.8			106	265
69.2	26	52	104	260
70.5			102	255
72	25	50	100	250
73.5			98	245
75	24	48	96	240

**METER TIMING TABLE FOR GAS INPUTS
AT LOW PRESSURE METERING
GAS RATE CUBIC FEET PER HOUR**

Seconds For One Revolution	Size of Test Dial			
	<u>1/2 cu. ft.</u>	<u>1 cu. ft.</u>	<u>2 cu. ft.</u>	<u>5 cu. ft.</u>
76.5			94	235
78	23	46	92	230
80			90	225
82	22	44	88	220

**METER TIMING TABLE FOR GAS INPUTS
AT 2 LBS. METERING PRESSURE**

Seconds For One Revolution	Size of Test Dial			
	<u>1/2 cu. ft.</u>	<u>1 cu. ft.</u>	<u>2 cu. ft.</u>	<u>5 cu. ft.</u>
10	201	401	803	2,007
11	183	365	730	1,824
12	167	334	669	1,672
13	154	309	619	1,544
14	144	287	573	1,434
15	134	268	535	1,338
16	126	251	502	1,254
17	118	236	473	1,181
18	112	223	446	1,115
19	106	211	423	1,056
20	100	201	401	1,003
21	96	191	382	956
22	91	183	365	912
23	87	175	349	873
24	84	167	334	836
25	80	161	321	803
26	77	154	309	772
27	75	148	298	744
28	71	144	287	717
29	69	138	277	692
30	67	134	268	669

**METER TIMING TABLE FOR GAS INPUTS
AT 2 LBS. METERING PRESSURE**

Seconds For One Revolution	Size of Test Dial			
	<u>1/2 cu. ft.</u>	<u>1 cu. ft.</u>	<u>2 cu. ft.</u>	<u>5 cu. ft.</u>
31		129	259	648
32	62	126	251	628
33		122	243	608
34	59	115	230	590
35		115	230	573
36	56	111	223	557
37		108	217	542
38	52	106	211	529
39		103	206	515
40	50	100	201	502
41			196	489
42	48	96	192	478
43			186	467
44	46	91	183	456
45	45	89	178	446
46		87	175	436
47	42		171	427
48		84	167	418
49			164	409
50	40	80	161	401
51			157	394

**METER TIMING TABLE FOR GAS INPUTS
AT 2 LBS. METERING PRESSURE**

Seconds For One Revolution	Size of Test Dial			
	<u>1/2 cu. ft.</u>	<u>1 cu. ft.</u>	<u>2 cu. ft.</u>	<u>5 cu. ft.</u>
52		77	154	386
53	38		152	379
54		75	148	371
55			146	365
56	36	71	144	358
57			140	352
58	35	69	138	346
59			136	340
60	33	67	134	334
62			129	323
64			125	313
66			122	304
68			118	295
70			115	287
72			111	279
74			108	271
76			106	264
78			103	258
80			100	251
82			98	245
84			96	239
86			94	233

**CAPACITY OF ORIFICES IN BTU
ORIFICE PRESSURE INCHES OF WATER**

SIZE DRILL	<u>3"</u>	<u>3-1/2"</u>	<u>4"</u>	<u>5"</u>	<u>6"</u>
80	385	416	445	520	545
79	450	486	525	605	640
78	560	605	650	745	785
77	710	767	825	955	1000
76	870	940	1005	1170	1250
75	920	994	1120	1300	1375
74	1120	1210	1300	1505	1585
73	1275	1377	1475	1715	1805
72	1395	1507	1605	1880	1970
71	1520	1642	1760	2030	2140
70	1820	1966	2090	2360	2545
69	1910	2063	2180	2545	2730
68	2180	2360	2545	2820	3090
1/32	2180	2435	2545	2910	3180
67	2275	2506	2730	3000	3275
66	2455	2651	2820	3270	3545
65	2820	3046	3275	3730	4000
64	3000	3240	3455	3910	4270
63	3180	3434	3635	4090	4450
62	3270	3532	3725	4270	4640
61	3455	3731	4000	4550	4910
60	3820	4126	4360	4910	5360
59	4000	4320	4550	5090	5640
58	4090	4417	4640	5270	5820
57	4270	4612	4910	5550	6000
56	4730	5108	5450	6180	6820
3/64	4910	5305	5550	6360	6910
55	6180	6674	7090	8000	8730
54	6810	7355	7810	8810	9630
53	7450	8046	8550	9630	11180
1/16	8000	8640	9170	10450	11440
52	9230	9968	10650	11900	12400
51	9640	10422	11000	12450	13620
50	10900	11772	12350	14090	15350

**CAPACITY OF ORIFICES IN BTU
ORIFICE PRESSURE INCHES OF WATER**

SIZE DRILL	<u>3"</u>	<u>3-1/2"</u>	<u>4"</u>	<u>5"</u>	<u>6"</u>
49	12000	12960	13710	15620	17000
48	13620	14710	15430	17520	19100
5/64	14090	15217	16180	18180	20000
47	14350	15498	16520	18700	20000
46	15620	16870	17900	20000	21800
45	16350	17350	18350	20700	22700
44	18180	19440	20700	22700	25410
43	20170	21435	22700	25410	28200
42	22700	24275	26400	29100	38100
3/32	23610	25455	27300	30900	33600
41	24550	26375	28200	31800	35450
40	26400	28200	30000	33600	36350
39	27250	28825	30900	34550	38200
38	28200	30325	31800	36350	40000
37	29100	31900	33600	38200	41800
36	30900	32150	35450	40000	43600
7/64	31800	33975	36350	41800	45450
35	32750	34150	37300	41800	46400
34	23650	34800	38200	42700	46400
33	34550	36825	39100	44550	48200
32	36400	38675	40950	46400	50950
31	37300	39550	41800	48100	52700
1/8	39100	41350	43600	50000	54500
30	44500	47725	50950	58100	63600
29	50000	53625	57250	64500	70950
28	53550	55700	60900	69050	75450
9/64	53550	57225	60900	69050	75450
27	55450	59075	62700	70950	78100
26	57200	61200	65450	74500	81800
25	59050	63575	68100	76400	83600
24	69060	65550	70000	79100	86400
23	62700	67300	71900	81900	89000
5/32	64500	69050	73600	83600	91750
22	65500	70500	74500	84500	91750

**CAPACITY OF ORIFICES IN BTU
ORIFICE PRESSURE INCHES OF WATER**

SIZE DRILL	3"	3-1/2"	4"	5"	6"
21	56200	71725	77250	87250	94500
20	69000	73550	78100	89000	97200
19	72600	78100	82600	93500	101900
18	75500	80900	86300	97200	106200
11/64	77200	83500	88100	100000	119000
17	81800	87700	93600	105300	115200
15	84500	90450	96400	109000	118100
14	86400	92250	98100	111800	121800
13	90000	95900	101800	115200	126200
3/16	91750	98075	104400	118100	130000
12	92600	99400	106200	120000	130900
11	93500	100300	107100	121000	131800
10	95400	101750	108100	122800	134500
9	99000	105900	112800	127110	139000
8	101000	108100	115200	130900	142700
7	103500	110750	118000	133500	145300
13/64	106200	113500	120800	136300	148100
6	107100	114500	121900	138000	150900
5	109000	116250	123500	140000	153800
4	112800	120400	128000	145200	158000
3	115300	123550	131800	149000	163500
7/32	122800	130900	139000	157000	171800
2	125200	134000	142800	161800	176200
1	133600	143700	151800	171800	188000
A	140000	150950	160000	180800	198000
15/64	140900	151700	160900	181800	199000
B	144500	154500	164500	186200	201800
C	151800	162650	173500	196200	214300
D	157000	168000	179000	202500	221800
1/4E	162800	173650	184500	208800	229000
F	172000	183750	195500	222000	242000
G	177200	189500	201800	227200	250000
17/64	183800	196500	209200	236200	269000
H	184500	197250	210000	238000	260000

**CAPACITY OF ORIFICES IN BTU
ORIFICE PRESSURE INCHES OF WATER**

<u>SIZE</u> <u>DRILL</u>	<u>3"</u>	<u>3-1/2"</u>	<u>4"</u>	<u>5"</u>	<u>6"</u>
I	192000		218200	248000	271000
J	199000		227200	254400	281000
K	205500		234500	263900	289000
9/32	206200		235500	265500	290000
L	216200		247200	279000	304500
M	223800		254500	288000	314500
19/64	227200		259200	294000	320000
N	234500		268000	303800	332000
5/16	254500		291000	330000	335500
O	261000		298000	336500	368000
P	275500		314500	354500	389000
21/64	284500		325500	367000	402000
Q	291000		334500	376000	411000
R	301000		343800	388000	425000
11/32	311000		354500	402000	439000
S	318000		364000	412000	450000
T	334500		382000	432000	471000
23/64	336200		385000	436000	476000
U	353000		403000	455000	498000
3/8	368000		421000	475000	520000
V	372500		425000	481000	525000
W	400000		457500	519000	565000
25/64	409000		468000	530000	580000
X	423000		483000	545000	596000
Y	436000		500000	566000	619000
13/32	444000		506000	573000	627000
27/64	477000		545500	615000	672000
7/16	500000		570000	645000	704500
29/64	545500		623000	705000	769000
15/32	581000		663000	754500	822000
31/64	618000		704000	796000	872000
1/2	651000		742000	840000	909000
17/32	690500		786000	872000	972000
9/16	764000		874500	982000	1081000

**CAPACITY OF ORIFICES IN BTU
ORIFICE PRESSURE INCHES OF WATER**

SIZE DRILL	<u>3"</u>	<u>3-1/2"</u>	<u>4"</u>	<u>5"</u>	<u>6"</u>
19/32	854000		972000	1100000	1200000
5/8	926000		1052500	1200000	1308000
21/32	1045000		1190000	1344000	1472000
11/16	1144000		1303000	1472000	1609000
23/32	1245000		1427000	1608000	762000
3/4	1362000		1553000	1752000	1918000
25/32	1480000		1690000	1908000	2090000
3/16	1600000		1825000	2060000	2262000
27/32	1722000		1962000	2205000	2419000
7/8	1845000		2105000	2380000	2600000
29/32	1980000		2255000	2555000	2790000
15/16	2120000		2419000	2725000	2982000
31/32	2275000		2590000	2925000	3200000
1	2419000		2762000	3125000	3420000

PRESSURE EQUIVALENTS

Equivalent Inches		Equivalent Inches	
Water	Mercury	Water	Mercury
0.10	0.007	8.0	0.588
0.20	0.015	9.0	0.662
0.30	0.022	10.0	0.74
0.40	0.029	11.0	0.81
0.50	0.037	12.0	0.88
0.60	0.04	13.0	0.96
0.70	0.051	13.6	1.00
0.80	0.059	13.9	1.02
0.90	0.066	14.0	1.06
1.00	0.074	15.0	1.10
1.36	0.100	16.0	1.18
1.74	0.128	17.0	1.25
2.00	0.147	18.0	1.33
2.77	0.203	19.0	1.40
3.00	0.221	20.0	1.47
4.00	0.294	25.0	1.84
5.0	0.368	27.2	2.00
6.0	0.442	27.7	2.03
7.0	0.515		

PRESSURE EQUIVALENTS

Pressure Per Square Inch		Pressure Per Square Inch	
Pounds	Ounces	Pounds	Ounces
0.0036	0.0577	0.289	4.62
0.0072	0.115	0.325	5.2
0.0108	4.173	0.361	5.77
0.0145	0.231	0.397	6.34
0.0181	0.289	0.433	6.92
0.0217	0.346	0.469	7.50
0.0253	0.404	0.491	7.86
0.0289	0.462	0.500	8.00
0.325	0.520	0.505	8.08
0.036	0.577	0.542	8.7
0.049	0.785	0.578	9.2
0.067	1.00	0.614	.8
0.072	1.15	0.650	10.4
0.100	1.60	.686	10.9
0.109	1.73	0.722	11.5
0.144	2.31	.903	14.4
0.181	2.89	0.975	15.7
0.217	3.46	1.00	16.0
0.253	4.04		

NATURAL GAS
Capacity of Low Pressure Fuel Runs
In Cubic Feet of Gas Per Hour

MAXIMUM ALLOWABLE DEMAND BY SIZE AND LENGTH

SIZE OF

<u>PIPE*</u>	<u>1/2"</u>	<u>3/4"</u>	<u>1"</u>	<u>1-1/4"</u>	<u>1-1/2"</u>	<u>2"</u>	<u>2-1/2"</u>
10	90	196	360	740	1070	1960	3090
20	71	158	298	620	910	1710	2700
30	60	136	260	550	810	1550	2470
40	53	120	230	498	740	1430	2280
50	48	111	210	452	680	1335	2100
60	44	102	196	420	640	1240	2000
70	41	95	185	398	600	1175	1890
80	39	89	174	376	570	1110	1800
90	37	84	165	355	540	1055	1730
100	35	80	157	340	515	1025	1650
110	33	77	150	325	492	980	1530
120	32	74	145	312	480	950	1540
130	31	71	138	302	460	920	1480
140	30	69	135	291	448	890	1430
150	29	67	130	282	438	865	1390
60	28	65	126	275	428	835	1350
170	27	63	123	268	412	820	1320
180	26	61	120	260	400	800	1290
190	26	60	117	252	390	780	1260
200	25	59	114	248	380	760	1235
210	25	57	111	252	372	740	1205
220	24	56	108	238	365	730	1180
230	24	55	106	232	360	715	1150
240	23	54	104	228	352	700	1130
250	23	53	102	221	345	685	1110
260	22	52	100	219	338	670	1090
270	22	51	99	215	331	660	1070
280	22	50	97	211	325	650	1050
290	21	49	95	208	320	640	1030
300	21	48	94	205	315	630	1010

SP. GR. 0.658

PRESSURE DRP 0.50" WATER

* LENGTH IN FEET (4 ELBOWS INCLUDED)

NOTE: For Straight Runs (No Elbows Refer to Pamphlet #54).

**MAXIMUM CAPACITY OF SEMIRIGID TUBING
CUBIC FEET PER HOUR**

.65 SPECIFIC GRAVITY 0.3" WATER COLUMN PRESSURE DROP

OUTSIDE DIAM. INCHES	LENGTH OF TUBING IN FEET									
	10	20	30	40	50	60	70	80	90	100
3/8"	18	11	9	8	-	-	-	-	-	-
1/2"	43	29	23	19	17	16	14	13	12	11
5/8"	93	61	50	42	36	33	30	28	26	25
3/4"	154	100	84	68	61	57	52	48	44	42
7/8"	235	162	129	110	93	87	76	72	68	64

**MAXIMUM CAPACITY OF CORRUGATED STAINLESS
STEEL TUBING
IN CUBIC FEET OF GAS PER HOUR FOR:
Gas Pressure: 5-7 inches Water Column
Pressure Drop: 0.5 inches Water Column**

(Based in 0.60 specific gravity gas)*

Length of Tubing Run	Tubing Size			
	(3/8)	(1/2)	(3/4)	(1)
5 feet	65	135	320	550
10 feet	50	95	220	380
15 feet	40	75	165	305
20 feet	35	65	150	265
25 feet	30	60	135	230
30 feet	30	55	120	215
40 feet	25	45	105	175
50 feet	25	40	90	160
60 feet	20	35	80	145
80 feet	20	35	70	120
100 feet	15	30	70	110
150 feet	10	30	65	100
200 feet	10	25	60	90
300 feet	5	20	45	70
500 feet	-	10	30	55

* Table includes losses for four 90 degree bends and two end fittings. To compute flow capacity for tubing runs with a larger number of bends and/or fittings, add the appropriate number of feet to the actual run length using the following formula.

$$L = 1.3 (n)$$

L = Number of feet to be added to actual run length

n = Number of bends and/or fittings over six.

SIZING CHART FOR TWO POUND PRESSURE PIPE

Cfh at 1-1/2 Pounds Pressure Drop - .65 Gravity Gas - Nominal Pipe or I.D. Tubing Size

Length in Ft.	1/4	3/8	1/2	5/8	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
5	540	1260	2400	4150	6500	10500	21000	31000	58000	90000	150M	310M
10	360	850	1630	2780	4350	7600	15000	22000	41000	64000	110M	220M
15	285	670	1280	2150	3450	6200	12000	18000	34000	52000	90000	180M
20	240	570	1080	1860	2950	5400	10500	15000	29000	45000	79000	150M
30	192	450	860	1480	2300	4400	8600	13000	24000	36000	63000	125M
40	163	380	730	1250	2000	3800	7500	11000	20000	32000	55000	110M
50	143	335	645	1100	1750	3350	6700	9800	18000	28000	49000	97000
60	130	300	580	1000	1560	3050	6100	9000	17000	26000	45000	90000
70	118	275	530	910	1430	2800	5600	8200	15000	24000	41000	82000
80	110	255	490	850	1330	2650	5200	7700	14000	22000	38000	77000
90	102	240	460	790	1230	2500	4900	7200	13500	21000	36000	72000
100	96	225	430	740	1160	2350	4700	6800	12500	20000	34500	70000
125	85	198	380	650	1025	2100	4150	6100	11300	18000	31000	62000
150	76	178	340	585	920	1900	3800	5600	10400	16000	28000	56000
175	69	164	315	540	845	1800	3550	5200	9700	15500	26000	53000
200	64	146	290	500	780	1700	3300	4900	9000	14000	24000	49000
250	58	140	255	440	690	1500	2950	4300	8100	12500	22000	44000
300	51	120	230	395	620	1350	2700	4000	7400	11500	19000	40000
O.D. Tubing Size	3/8	1/2	5/8	3/4	7/8	1-1/8	1-3/8	1-5/8	2-1/8	2-5/8	3-1/8	4-1/8

Use this chart when metering or reduced pressure is 2 PSIG. Minimum inlet pressure to pounds-to-inches regulator will be 1/2 pound or 14 inches.

FLOW CAPACITY TABLE FOR TUBING - 2 p.s.i.

MUELLER FORMULA USED

PIPE INLET PRESSURE = 3.00

PRESSURE DROP = 0.50

SPECIFIC GRAVITY = 0.60

INSIDE DIAMETER OF TUBING (INCHES)

LENGTH	3/8"	1/2"	5/8"	1"	1-1/8"
FT	0.315	0.430	0.545	0.906	1.025
10	207.	482.	920.	3675.	144.
20	139.	324.	618.	2467.	3453.
30	110.	256.	489.	1954.	2735.
40	93.	217.	415.	1656.	2318.
50	82.	191.	365.	1457.	2039.
60	74.	172.	328.	1312.	1836.
70	67.	158.	300.	1200.	1680.
80	62.	146.	278.	1112.	1556.
90	58.	136.	260.	1039.	1454.
100	55.	128.	245.	978.	1369.
125	48.	113.	215.	860.	1204.
150	44.	102.	194.	774.	1084.
175	40.	93.	177.	709.	992.
200	37.	86.	164.	656.	919.
225	34.	80.	154.	612.	859.
250	32.	76.	145.	577.	808.
275	31.	72.	137.	547.	765.
300	29.	68.	130.	520.	728.
350	27.	62.	119.	476.	666.
400	25.	58.	110.	441.	617.
450	23.	54.	103.	412.	576.
500	22.	51.	97.	388.	542.
550	21.	48.	92.	367.	514.
600	20.	46.	87.	349.	488.
700	18.	42.	80.	319.	447.
800	17.	38.	74.	296.	414.
900	16.	36.	69.	276.	387.
1000	15.	34.	65.	260.	364.

**MAXIMUM CAPACITY OF CORRUGATED STAINLESS
STEEL TUBING**

IN CUBIC FEET OF GAS PER HOUR FOR:

Gas Pressure: 2 psi

Pressure Drop: 1.5 psi

Including losses of a Maxitrol 325-5A Regulator

(Based in 0.60 specific gravity gas)*

Length of Tubing Run	Tubing Size			
	(3/8)	(1/2)	(3/4)	(1)
5 feet	439	673	673	673
10 feet	332	639	673	673
15 feet	290	576	673	673
20 feet	254	533	673	673
25 feet	235	497	673	673
30 feet	218	466	673	673
40 feet	193	420	669	673
50 feet	175	382	642	673
60 feet	162	352	612	673
80 feet	145	304	566	673
100 feet	129	284	533	673
150 feet	106	236	473	635
200 feet	90	207	421	595
300 feet	75	168	353	529
500 feet	61	130	286	439

* Table includes losses for four 90 degree bends and two end fittings. To compute flow capacity for tubing runs with a larger number of bends and/or fittings, add the appropriate number of feet to the actual run length using the following formula.

$$L = 1.3 (n)$$

L = Number of feet to be added to actual run length

n = Number of bends and/or fittings over six.

MEASUREMENT OF HEAT CONTENT

TYPE OF FUEL B.T.U. PER UNIT OF MEASURE

Natural Gas.....	1,032 Per Cu. Ft.
Mixed Gas	800 Per Cu. Ft.
	Manufactured Gas 530 Per Cu. Ft.
Propane	2,500 Per Cu. Ft.
	91,500 Per Gal.
Butane	3,000 to 4,000 Per Cu. Ft.
	102,000 Per Gal.
#1 Fuel Oil.....	136,000 Per Gal.
#2 Fuel Oil.....	138,000 Per Gal.
#3 Fuel Oil.....	141,000 Per Gal.
#4 Fuel Oil.....	145,000 Per Gal.
#5 Fuel Oil.....	148,000 Per Gal.
#6 Fuel Oil.....	152,000 Per Gal.
Electric.....	3,414 Per K.W.H.
Stoker Coal.....	Av. 25,000,000 Per Ton.

1. British Thermal Unit (BTU) is the amount of heat required to raise the temperature of one pound of pure water one degree Fahrenheit (59.5 to 60.5oF.)
2. Kilowatt-Hour (KWH) is the amount of energy produced by expending 1 kilowatt for 1 hour. The kilowatt (1000 watts) is used in electrical work as a convenient unit of power measurement.
3. Therm-Measurement of heat- 100,000 BTU
4. Gallon (U.S.)-231 Cu. In.

SPECIFICATIONS FOR THREADING PIPE

Diameter of Pipe - Inches

Actual		Approximate Length Of Threaded Portion <u>(Inches)</u>	Approximate No. Of Threads <u>To Be Cut</u>
<u>Size Pipe</u>	<u>Outside Size</u>		
1/8	0.405		
1/4	0.540		
3/8	0.675		
1/2	0.840	3/4	10
3/4	1.050	3/4	10
1	1.315	7/8	10
1-1/4	1.660	1	11
1-1/2	1.900	1	11
2	2.375	1	11
2-1/2	2.875	1-1/2	12
3	3.500	1-1/2	12
3-1/2	4.000		
4	4.500	1-5/8	13

DRILL SIZES FOR PIPE TAPS

<u>Size Of Tap In Inches</u>	<u>Number Of Threads per Inch</u>	<u>Diam. Of Drill</u>
1/8	27	11/32
1/4	18	7/16
3/8	18	37/64
1/2	14	23/32
3/4	14	59/64
1	11-1/2	1-5/32
1-1/4	11-1/2	1-1/2
1-1/2	11-1/2	1-49/64
2	11-1/2	2-3/16
2-1/2	8	2-9/16
3	8	3-3/16
3-1/2	8	3-11/16
4	8	4-3/16
4-1/2	8	4-3/4
5	8	5-5/16
6	8	6-5/16

**GAS APPLIANCE REGULATORS
BY MAXITROL
325-3, 325-5, 325-5H**

MAXIMUM INLET PRESSURES:

325-3, 325-5, 325-5H 10 psi

EMERGENCY EXPOSURE LIMITS:

325-3, 325-5, 325-5H 65 psi

Inlet side only

AMBIENT TEMPERATURE LIMITS:

325-3, 325-5, 325-5H -40 to 205F

VENTING:

325-3 Model 1/8NPT

325-5 & 325-5H Models 3/8NPT

GASES: Natural, manufactured, mixed liquefied petroleum or LP gas-air mixture.

MOUNTING: The 325-3 & 325-5 are suitable for multipoise mounting. When using the 12A09 vent limiting device, the 325.3 must be mounted in the upright position for best performance. The 325-5H should be mounted in upright position only.

NOTE: All Maxitrol appliance regulators should be installed and operated in accordance with Maxitrol's "Safety Warning" Bulletin.

These regulators provide no downstream overpressure protection in the event of failure. They should not be used if the appliance controls downstream will not safely contain gas when exposed to supply pressure.

The 325 series is a pounds to inches regulator for use on residential, commercial, and industrial applications where adequate inlet pressures are available. They feature a high leverage valve linkage to deliver positive dead-end lock-up and precise regulating control from full flow down to tiny pilot flows.

The series, a high performance type, can be used as a single stage regulator reducing from pounds pressure to normal burning pressure, or as a first stage regulator of a 2-stage system on equipment already fitted with an appliance regulator.

The 325-5H is a modified version of the 325-5. Fitted with an orifice plate and retainer in the vent outlet, it permits the utilization of greater capacities without sacrificing performance.

The self-aligning valve, on all models, is made of Buna-N rubber. Valve resiliency helps provide full shut-off even if minute line impurities get on valve seat. Housings are rugged aluminum die castings and all internal parts are carefully selected and corrosion resistant. The diaphragms are of high quality supported synthetic rubber compounds.

As an optional accessory, the 325-3 model offers an automatic vent limiting device (for use with maximum inlet pressure of 5 psi LP). It eliminates the need to run vent piping to a safe area. In the event of a diaphragm rupture, gas escapement is limited within ANSI standards level.

For use on commercial ranges, baking ovens, large water heaters, boilers, unit heaters, steam generators, and furnaces. The 325-3 & 325-5 models are widely accepted with 2 & 5 psig house piping systems.

DIMENSIONS AND PRESSURE DROP

DIMENSIONS - in inches

Model Number and Swing Radius		Call-Outs			
		A	B	C	D
325-3	3	3-1/2	4-1/4	3-7/8	5/8
325-5	4 7/8	5-1/4	5-7/8	5-7/16	15/16
325-5H	4 7/8	5-1/4	5-7/8	5-7/16	15/16

SPRING SELECTION CHART - inches w.c. unless noted

Model Number and Standard Spring		Other Springs Available					
325-3	2 to 6	5-9	6-10	4-12	10-22	15-30	1-2 psi
325-5	2 to 6	-	-	4-12	10-22	15-30	1-2 psi
325-5H	2 to 6	-	-	4-12	10-22	15-30	1-2 psi

CAPACITIES - expressed in ft³/h - 0.64 sp gr gas

Model Number and Pipe Size		Pressure Drop								
		0.3"	0.5"	1.0"	3.0"	5.0"	7.0"	ft psi	fl psi	1 psi
325-3	3/8 x 3/8	30	38	55	95	122	145	204	250	289
	fi x fi	30	38	55	95	122	145	204	250	289
325-5	fi x fi	70	90	128	221	286	338	476	583	673
	fl x fl	70	90	128	221	286	338	476	583	673
	1 x 1	70	90	128	221	286	338	476	583	673

		0.3"	0.5"	1.0"	3.0"	5.0"	7.0"	ft psi	1 psi	2 psi	3 psi
325-5H	fi x fi	70	90	128	221	286	338	476	673	952	1250
	fl x fl	70	90	128	221	286	338	476	673	952	1250
	1 x 1	70	90	128	221	286	338	476	673	952	1250

DIMENSIONS AND PRESSURE DROP

Specifications

Mounting: Mount with gas flow direction as marked on bottom casting.

Accessories: If using the 12A09 automatic vent limiting device (325-3 Only), the regulator should be mounted in an upright position. This permits the device to achieve quick response on the closing cycle. No hazard exists due to other mounting planes, however, and leakage rate is still limited.

Lockup Characteristics: Positive shut-off type. With adequate venting, outlet pressure rise is maintained within utility accepted standards under static conditions of no gas flow.

Vent:

Model 325-3 - vertical vent boss tapped 1/8" NPT

Model 325-5 - vertical vent boss tapped 3/8" NPT

Operating Limits:

Max. Operating inlet pressure 10psi

Max. Emergency exposure pressure (inlet side only) . . . 65psi

May not regulate satisfactorily at this pressure but will suffer no internal damage.

Ambient Limits:

Minimum -40F

Maximum 205F

Gasses: For natural, manufactured, mixed, liquefied petroleum

Be sure the rubber hose is not kinked shut; if it is, the reading will not be accurate.

5. Read each side from the zero and add the two readings. The readings should be made to the nearest tenth of an inch.

NOTE: The top of the column of water in each side is crescent shaped downward and is called the meniscus. Always read the lower edges of the water meniscus, keeping the eyes level with the bottom of the curve for accurate readings.

UTILITY SERVICE COLORS

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