



## Alliant Energy - Gas Service Manual Appendix

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Supersedes: 2019

### A. APPROXIMATE GAS INPUT FOR TYPICAL APPLIANCES

Appliance	Input Btu/hr (approx.)
Warm air furnace, single family	100,000
Warm air furnace, multifamily, per unit	60,000
Hydronic boiler , single family	120,000
Hydronic boiler, multifamily, per unit	75,000
Water heater, automatic storage, 30 gal to 40 gal tank	35,000
Water heater, automatic storage, 50 gal tank	50,000
Water heater, automatic instantaneous, Capacity at 2 gal/min	142,800
Water heater, automatic instantaneous, Capacity at 4 gal/min	285,000
Water heater, automatic instantaneous, Capacity at 6 gal/min	428,400
Water heater, domestic, circulating or side-arm	35,000
Range, freestanding, domestic	65,000
Built-in oven or broiler unit, domestic	25,000
Built-in top unit, domestic	40,000
Refrigerator	3,000
Clothes dryer, Type 1 (domestic)	35,000
Gas fireplace, direct vent	40,000
Gas log	80,000
Barbeque	40,000
Gas light	2,500
(For SI units, 1 Btu/hr = 0.293 W, 1 gal = 3.8 L)	



## **B. CUSTOMER PIPING MATERIAL SPECIFICATIONS**

The manufacturers listed below provide gas materials that are considered acceptable by the Company. This list does not include all manufacturers that meet these criteria but is intended to provide a sample of sources from which acceptable gas materials can be obtained.

Most manufacturers have installation guidelines on their websites. For more information on installation, visit the manufacturer's website.

### **Customer provided shut-off valves**

Threaded valve manufacturers: A.Y. McDonald, Eclipse, Mueller

Flanged valve manufacturers: Nordstrom/Flowserve, RESUN, Walworth

### **Corrugated Stainless Steel Tubing (CSST) Pipe**

Manufacturers: Ward Manufacturing, Omegaflex, Gastite, Parker Hannifin Corporation, Tru-Flex Metal Hose, Metal-Fab Inc.

### **Underground Risers**

Manufacturer: Elster-Perfection, RW Lyall, Chicago Fittings

### **Flanges**

Customer flanges that will meet up with Company flanges must meet the requirements of ANSI/ASME B16.5 or MSS SP-44 and must have a minimum ANSI/ASME rating of Class 125. All other flanges on customer piping must meet the requirements of ASME B16.1, ASME B16.5, ASME B16.24, ASME B16.42, or ASME B16.47 per NFPA 54, Section 5.6.10.

Where ANSI/ASME Class 150 steel flanges are bolted to ANSI/ASME Class 125 cast iron flanges, the raised face on the steel flange shall be removed.

Lapped flanges shall only be used above ground or in exposed locations accessible for inspection.

### **Gaskets**

Metallic flange gaskets shall be in accordance with ASME B16.20. Non-metallic flange gaskets shall be in accordance with ASME B16.21.

Full-face flange gaskets shall be used with all non-steel flanges.

When a flanged joint is separated, the gasket shall be replaced.



**ENERGY CONVERSION FACTORS**

- 1 Cf (Cubic Feet) = Approximately 1,000 Btu
  - 1 Ccf = 100 Cf = 1 Therm
  - 1 Therm = 100,000 Btu = 100 Cf = 0.1 Mcf
  - 10 Therms = 1 Mcf = 1 MMBtu
  - 1 Mcf = 1,000 Cf = 10 Ccf = 10 Therms = 1 Dth
  - 1 MMcf = 1,000 Mcf = 1,000,000 scf
  - 1 Quad = 10<sup>9</sup> Mcf = 10<sup>10</sup> Therms = 10<sup>15</sup> Btu
- C = Hundred
  - M = Thousand
  - MM = Million
  - Dth = Dekatherm

Comparative Thermal Values	1.00 million Btu	24.0 million Btu	0.0916 million Btu	0.125 million Btu	0.139 million Btu	0.150 million Btu	0.003412 million Btu
Natural Gas 1,000 Btu / Cf	1,000 Cf	24,000 Cf	91.600 Cf	125.000 Cf	139.000 Cf	150.000 Cf	3.412 Cf
Coal 12,000 Btu /lb	83.333 lb	2,000 lb	7.633 lb	10.417 lb	11.583 lb	12.500 lb	0.2843 lb
Propane 91,600 Btu /Gal	10.917 Gal	262.009 Gal	1 Gal	1.365 Gal	1.517 Gal	1.638 Gal	0.0373 Gal
Gasoline 125,000 Btu /Gal	8.000 Gal	192.000 Gal	0.733 Gal	1 Gal	1.112 Gal	1.200 Gal	0.0273 Gal
Fuel Oil #2 139,000 Btu /Gal	7.194 Gal	172.662 Gal	0.659 Gal	0.899 Gal	1 Gal	1.079 Gal	0.0245 Gal
Fuel Oil #6 150,000 Btu /Gal	6.666 Gal	160.000 Gal	0.611 Gal	0.833 Gal	0.927 Gal	1 Gal	0.0277 Gal
Electricity 3,412 Btu /Kwh	293.083 Kwh	7,033.998 Kwh	26.846 Kwh	36.635 Kwh	40.739 Kwh	43.962 Kwh	1 Kwh