

South Dakota Natural Gas Residential Furnaces - Energy Savings Table

Retrofit Choose New or Retrofit from Drop-Down Menu to the left

Calculator

Furnace Size (BTU) 75,000
 Heating Efficiency 93%
Savings (MMBTU) 11.8

Burner Btu/yr = $(EFLH \times QH) / AFUE$

Where:

- EFLH= Effective Full Load Hours
- QH = The design heating load - Btu/hr (table 2)
- AFUE = annual efficiency rating (table 1)

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (BTU)	Energy Factor 0.92	Energy Factor 0.93	Energy Factor 0.94	Energy Factor 0.95	Energy Factor 0.96	Energy Factor 0.97
30,000	4.5	4.7	5.0	5.2	5.5	5.7
35,000	5.2	5.5	5.8	6.1	6.4	6.7
40,000	6.0	6.3	6.7	7.0	7.3	7.7
45,000	6.7	7.1	7.5	7.9	8.2	8.6
50,000	7.4	7.9	8.3	8.7	9.2	9.6
55,000	8.2	8.7	9.2	9.6	10.1	10.5
60,000	8.9	9.5	10.0	10.5	11.0	11.5
65,000	9.7	10.2	10.8	11.4	11.9	12.4
70,000	10.4	11.0	11.6	12.2	12.8	13.4
75,000	11.2	11.8	12.5	13.1	13.7	14.4
80,000	11.9	12.6	13.3	14.0	14.7	15.3
85,000	12.6	13.4	14.1	14.9	15.6	16.3
90,000	13.4	14.2	15.0	15.7	16.5	17.2
95,000	14.1	15.0	15.8	16.6	17.4	18.2

South Dakota Natural Gas Residential Furnaces - Energy Savings Table

100,000	14.9	15.8	16.6	17.5	18.3	19.1
105,000	15.6	16.6	17.5	18.4	19.2	20.1
110,000	16.4	17.3	18.3	19.2	20.2	21.1
115,000	17.1	18.1	19.1	20.1	21.1	22.0
120,000	17.9	18.9	20.0	21.0	22.0	23.0
125,000	18.6	19.7	20.8	21.9	22.9	23.9
130,000	19.3	20.5	21.6	22.7	23.8	24.9
135,000	20.1	21.3	22.5	23.6	24.7	25.9
140,000	20.8	22.1	23.3	24.5	25.7	26.8
145,000	21.6	22.9	24.1	25.4	26.6	27.8
150,000	22.3	23.7	25.0	26.2	27.5	28.7
155,000	23.1	24.4	25.8	27.1	28.4	29.7
160,000	23.8	25.2	26.6	28.0	29.3	30.6
165,000	24.5	26.0	27.5	28.9	30.2	31.6
170,000	25.3	26.8	28.3	29.7	31.2	32.6
175,000	26.0	27.6	29.1	30.6	32.1	33.5
180,000	26.8	28.4	30.0	31.5	33.0	34.5
185,000	27.5	29.2	30.8	32.4	33.9	35.4
190,000	28.3	30.0	31.6	33.2	34.8	36.4
195,000	29.0	30.7	32.4	34.1	35.7	37.3
200,000	29.8	31.5	33.3	35.0	36.7	38.3
205,000	30.5	32.3	34.1	35.9	37.6	39.3
210,000	31.2	33.1	34.9	36.7	38.5	40.2
215,000	32.0	33.9	35.8	37.6	39.4	41.2
220,000	32.7	34.7	36.6	38.5	40.3	42.1
225,000	33.5	35.5	37.4	39.4	41.2	43.1

South Dakota Natural Gas Residential Furnaces - Energy Savings Table

New Choose New or Retrofit from Drop-Down Menu to the left

Calculator

Furnace Size (BTU) 75,000
 Heating Efficiency 95%
 Savings (MMBTU) 7.1

Burner Btu/yr = (EFLH x QH)/AFUE

Where:

- EFLH= Effective Full Load Hours
- QH = The design heating load - Btu/hr (table 2)
- AFUE = annual efficiency rating (table 1)

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (BTU)	Energy Factor 0.92	Energy Factor 0.93	Energy Factor 0.94	Energy Factor 0.95	Energy Factor 0.96	Energy Factor 0.97
30,000	2.0	2.3	2.6	2.8	3.1	3.3
35,000	2.4	2.7	3.0	3.3	3.6	3.9
40,000	2.7	3.1	3.4	3.8	4.1	4.4
45,000	3.1	3.5	3.9	4.2	4.6	5.0
50,000	3.4	3.9	4.3	4.7	5.1	5.5
55,000	3.8	4.2	4.7	5.2	5.7	6.1
60,000	4.1	4.6	5.2	5.7	6.2	6.7
65,000	4.4	5.0	5.6	6.1	6.7	7.2
70,000	4.8	5.4	6.0	6.6	7.2	7.8
75,000	5.1	5.8	6.4	7.1	7.7	8.3
80,000	5.5	6.2	6.9	7.6	8.2	8.9
85,000	5.8	6.6	7.3	8.0	8.7	9.4
90,000	6.1	6.9	7.7	8.5	9.3	10.0
95,000	6.5	7.3	8.2	9.0	9.8	10.5

South Dakota Natural Gas Residential Furnaces - Energy Savings Table

100,000	6.8	7.7	8.6	9.4	10.3	11.1
105,000	7.2	8.1	9.0	9.9	10.8	11.7
110,000	7.5	8.5	9.4	10.4	11.3	12.2
115,000	7.8	8.9	9.9	10.9	11.8	12.8
120,000	8.2	9.3	10.3	11.3	12.3	13.3
125,000	8.5	9.6	10.7	11.8	12.8	13.9
130,000	8.9	10.0	11.2	12.3	13.4	14.4
135,000	9.2	10.4	11.6	12.7	13.9	15.0
140,000	9.6	10.8	12.0	13.2	14.4	15.5
145,000	9.9	11.2	12.5	13.7	14.9	16.1
150,000	10.2	11.6	12.9	14.2	15.4	16.6
155,000	10.6	12.0	13.3	14.6	15.9	17.2
160,000	10.9	12.3	13.7	15.1	16.4	17.8
165,000	11.3	12.7	14.2	15.6	17.0	18.3
170,000	11.6	13.1	14.6	16.1	17.5	18.9
175,000	11.9	13.5	15.0	16.5	18.0	19.4
180,000	12.3	13.9	15.5	17.0	18.5	20.0
185,000	12.6	14.3	15.9	17.5	19.0	20.5
190,000	13.0	14.7	16.3	17.9	19.5	21.1
195,000	13.3	15.0	16.7	18.4	20.0	21.6
200,000	13.7	15.4	17.2	18.9	20.6	22.2
205,000	14.0	15.8	17.6	19.4	21.1	22.8
210,000	14.3	16.2	18.0	19.8	21.6	23.3
215,000	14.7	16.6	18.5	20.3	22.1	23.9
220,000	15.0	17.0	18.9	20.8	22.6	24.4
225,000	15.4	17.4	19.3	21.2	23.1	25.0

South Dakota Natural Gas Residential Furnaces - Energy Savings Table

Retrofit Choose New or Retrofit from Drop-Down Menu to the left

Calculator

Furnace Size (BTU) 75,000
 Heating Efficiency 95%
 Savings (MMBTU) 13.1

Burner Btu/yr = (EFLH x QH)/AFUE

Where:

- EFLH= Effective Full Load Hours
- QH = The design heating load - Btu/hr (table 2)
- AFUE = annual efficiency rating (table 1)

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (BTU)	Energy Factor 0.92	Energy Factor 0.93	Energy Factor 0.94	Energy Factor 0.95	Energy Factor 0.96	Energy Factor 0.97
30,000	4.5	4.7	5.0	5.2	5.5	5.7
35,000	5.2	5.5	5.8	6.1	6.4	6.7
40,000	6.0	6.3	6.7	7.0	7.3	7.7
45,000	6.7	7.1	7.5	7.9	8.2	8.6
50,000	7.4	7.9	8.3	8.7	9.2	9.6
55,000	8.2	8.7	9.2	9.6	10.1	10.5
60,000	8.9	9.5	10.0	10.5	11.0	11.5
65,000	9.7	10.2	10.8	11.4	11.9	12.4
70,000	10.4	11.0	11.6	12.2	12.8	13.4
75,000	11.2	11.8	12.5	13.1	13.7	14.4
80,000	11.9	12.6	13.3	14.0	14.7	15.3
85,000	12.6	13.4	14.1	14.9	15.6	16.3
90,000	13.4	14.2	15.0	15.7	16.5	17.2
95,000	14.1	15.0	15.8	16.6	17.4	18.2

South Dakota Natural Gas Residential Furnaces - Energy Savings Table

100,000	14.9	15.8	16.6	17.5	18.3	19.1
105,000	15.6	16.6	17.5	18.4	19.2	20.1
110,000	16.4	17.3	18.3	19.2	20.2	21.1
115,000	17.1	18.1	19.1	20.1	21.1	22.0
120,000	17.9	18.9	20.0	21.0	22.0	23.0
125,000	18.6	19.7	20.8	21.9	22.9	23.9
130,000	19.3	20.5	21.6	22.7	23.8	24.9
135,000	20.1	21.3	22.5	23.6	24.7	25.9
140,000	20.8	22.1	23.3	24.5	25.7	26.8
145,000	21.6	22.9	24.1	25.4	26.6	27.8
150,000	22.3	23.7	25.0	26.2	27.5	28.7
155,000	23.1	24.4	25.8	27.1	28.4	29.7
160,000	23.8	25.2	26.6	28.0	29.3	30.6
165,000	24.5	26.0	27.5	28.9	30.2	31.6
170,000	25.3	26.8	28.3	29.7	31.2	32.6
175,000	26.0	27.6	29.1	30.6	32.1	33.5
180,000	26.8	28.4	30.0	31.5	33.0	34.5
185,000	27.5	29.2	30.8	32.4	33.9	35.4
190,000	28.3	30.0	31.6	33.2	34.8	36.4
195,000	29.0	30.7	32.4	34.1	35.7	37.3
200,000	29.8	31.5	33.3	35.0	36.7	38.3
205,000	30.5	32.3	34.1	35.9	37.6	39.3
210,000	31.2	33.1	34.9	36.7	38.5	40.2
215,000	32.0	33.9	35.8	37.6	39.4	41.2
220,000	32.7	34.7	36.6	38.5	40.3	42.1
225,000	33.5	35.5	37.4	39.4	41.2	43.1

South Dakota Natural Gas Furnace Tune Up Energy Savings Table

Calculator

Furnace Size (BTU) 75,000
Savings (MMBTU) 2.9

$$\text{Burner Btu/yr} = ((\text{EFLH} \times \text{QH}) / \text{AFUE}_{\text{before_tune-up}}) - ((\text{EFLH} \times \text{QH}) / \text{AFUE}_{\text{after_tune-up}})$$

Where:

EFLH= Effective Full Load Hours
QH = The design heating load - Btu/hr (table 2)
AFUE = annual efficiency rating (table 1)

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (BTU)	Energy Factor 0.78
30,000	1.2
35,000	1.4
40,000	1.6
45,000	1.8
50,000	2.0
55,000	2.2
60,000	2.3
65,000	2.5
70,000	2.7
75,000	2.9
80,000	3.1
85,000	3.3
90,000	3.5
95,000	3.7
100,000	3.9
105,000	4.1
110,000	4.3
115,000	4.5
120,000	4.7
125,000	4.9
130,000	5.1
135,000	5.3
140,000	5.5
145,000	5.7
150,000	5.9
155,000	6.1

South Dakota Natural Gas Furnace Tune Up

160,000	6.3
165,000	6.5
170,000	6.6
175,000	6.8
180,000	7.0
185,000	7.2
190,000	7.4
195,000	7.6
200,000	7.8
205,000	8.0
210,000	8.2
215,000	8.4
220,000	8.6
225,000	8.8

South Dakota Natural Gas Storage Water Heating - Energy Savings Table

Savings for Tankless Water Heaters = 4.85 dk

Calculator for 50 Gallon Tank

Energy Factor 0.62
 Savings (MMBTU) 2.0

Calculator for 40 Gallon Tank

Energy Factor 0.62
 Savings (MMBTU) 1.4

Calculator for 30 Gallon Tank

Energy Factor 0.62
 Savings (MMBTU) 0.5

Gas Energy Savings The = Annual_Consumption ÷ Minimum_EF - Annual Consumption ÷ EF for Energy Efficient Model * Tanksize_Adjustment_Factor
 Gas Demand Savings (F = Gas Energy Savings (from formula 1) x Therm_Peak_Savings_factor x Tanksize Adjustment Factor

Where:
 Annual_Consumption = Base Therms for impacts of improving storage water heater efficiency (Table 2)
 Minimum_EF = Lowest efficiency EF based on Federal Standard for Tank Size Installed (Table 1)
 Therm_Peak_Savings_I = Multiplier against Therm annual savings to produce peak day savings (Table 1)
 Tanksize_Adjustment_ = Adjustment to estimated annual gallons use (based on occupancy) associated with storage Tank Size

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Storage Size (Gallon)	Energy Factor 0.62	Energy Factor 0.63	Energy Factor 0.64	Energy Factor 0.65	Energy Factor 0.66	Energy Factor 0.67	Energy Factor 0.68
50	1.96	2.41	2.85	3.27	3.68	4.08	4.47
40	1.45	1.90	2.33	2.76	3.17	3.57	3.95
30	0.47	0.92	1.35	1.78	2.19	2.59	2.98

South Dakota Natural Gas Storage Water Heating - Energy Savings Table

Storage Size (Gallon)	Energy Factor 0.69	Energy Factor 0.70	Energy Factor 0.71	Energy Factor 0.72	Energy Factor 0.73	Energy Factor 0.74	Energy Factor 0.75
50	4.85	5.21	5.57	5.91	6.25	6.57	6.89
40	4.33	4.70	5.05	5.40	5.73	6.06	6.37
30	3.35	3.72	4.07	4.42	4.75	5.08	5.39

Storage Size (Gallon)	Energy Factor 0.76	Energy Factor 0.77	Energy Factor 0.78	Energy Factor 0.79	Energy Factor 0.80	Energy Factor 0.81	Energy Factor 0.82
50	7.20	7.50	7.79	8.08	8.36	8.63	8.90
40	6.68	6.99	7.28	7.56	7.84	8.12	8.38
30	5.70	6.01	6.30	6.59	6.86	7.14	7.40

Storage Size (Gallon)	Energy Factor 0.83	Energy Factor 0.84	Energy Factor 0.85	Energy Factor 0.86	Energy Factor 0.87	Energy Factor 0.88	Energy Factor 0.89
50	9.16	9.41	9.66	9.90	10.13	10.36	10.59
40	8.64	8.89	9.14	9.38	9.62	9.85	10.07
30	7.66	7.91	8.16	8.40	8.64	8.87	9.09

Storage Size (Gallon)	Energy Factor 0.90	Energy Factor 0.91	Energy Factor 0.92
50	9.16	11.02	11.23
40	8.64	10.51	10.72
30	7.66	9.53	9.74

South Dakota Natural Gas Storage Water Heating - Energy Savings Table

Savings for Tankless Water Heaters = 4.85 dk

Calculator for 50 Gallon Tank

Energy Factor 0.67
 Savings (MMBTU) 4.1

Calculator for 40 Gallon Tank

Energy Factor 0.67
 Savings (MMBTU) 3.6

Calculator for 30 Gallon Tank

Energy Factor 0.67
 Savings (MMBTU) 2.6

Gas Energy Savings $T_{he} = \text{Annual_Consumption} \div \text{Minimum_EF} - \text{Annual Consumption} \div \text{EF for Energy Efficient Model} * \text{Tanksize_Adjustment_Factor}$
 Gas Demand Savings $(F = \text{Gas Energy Savings (from formula 1)} \times \text{Therm_Peak_Savings_factor} \times \text{Tanksize Adjustment Factor})$

Where:
 Annual_Consumption = Base Therms for impacts of improving storage water heater efficiency (Table 2)
 Minimum_EF = Lowest efficiency EF based on Federal Standard for Tank Size Installed (Table 1)
 Therm_Peak_Savings_I = Multiplier against Therm annual savings to produce peak day savings (Table 1)
 Tanksize_Adjustment_ = Adjustment to estimated annual gallons use (based on occupancy) associated with storage Tank Size

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Storage Size (Gallon)	Energy Factor 0.62	Energy Factor 0.63	Energy Factor 0.64	Energy Factor 0.65	Energy Factor 0.66	Energy Factor 0.67	Energy Factor 0.68
50	1.96	2.41	2.85	3.27	3.68	4.08	4.47
40	1.45	1.90	2.33	2.76	3.17	3.57	3.95
30	0.47	0.92	1.35	1.78	2.19	2.59	2.98

South Dakota Natural Gas Storage Water Heating - Energy Savings Table

Storage Size (Gallon)	Energy Factor 0.69	Energy Factor 0.70	Energy Factor 0.71	Energy Factor 0.72	Energy Factor 0.73	Energy Factor 0.74	Energy Factor 0.75
50	4.85	5.21	5.57	5.91	6.25	6.57	6.89
40	4.33	4.70	5.05	5.40	5.73	6.06	6.37
30	3.35	3.72	4.07	4.42	4.75	5.08	5.39

Storage Size (Gallon)	Energy Factor 0.76	Energy Factor 0.77	Energy Factor 0.78	Energy Factor 0.79	Energy Factor 0.80	Energy Factor 0.81	Energy Factor 0.82
50	7.20	7.50	7.79	8.08	8.36	8.63	8.90
40	6.68	6.99	7.28	7.56	7.84	8.12	8.38
30	5.70	6.01	6.30	6.59	6.86	7.14	7.40

Storage Size (Gallon)	Energy Factor 0.83	Energy Factor 0.84	Energy Factor 0.85	Energy Factor 0.86	Energy Factor 0.87	Energy Factor 0.88	Energy Factor 0.89
50	9.16	9.41	9.66	9.90	10.13	10.36	10.59
40	8.64	8.89	9.14	9.38	9.62	9.85	10.07
30	7.66	7.91	8.16	8.40	8.64	8.87	9.09

Storage Size (Gallon)	Energy Factor 0.90	Energy Factor 0.91	Energy Factor 0.92
50	9.16	11.02	11.23
40	8.64	10.51	10.72
30	7.66	9.53	9.74

South Dakota Natural Gas Commercial Furnaces - Energy Savings Table

Replacement Choose Replacement or New from Drop-Down Menu to the left

Calculator

Furnace Size (BTU) 75,000
 Heating Efficiency 93%
Savings (MMBTU) 20.8

$$\text{Gas Energy Heating Savings (MMBTU/yr)} = (\text{kBtu/hr}_{\text{heat}}) \times (\text{HDD}) \times (24 \text{ Hrs/Day}) \times (\text{Oversize Factor}_{\text{heat}}) \times [1 / (T_{\text{indoor}} - T_{\text{design}})] \times (1 / \text{Heat}_{\text{Base}} - 1 / \text{Heat}_{\text{Eff}}) \times (1 \text{ MMBTU} / 1000000 \text{ BTU})$$

Where:

kBtu/h_{heat} = the nominal rating of the heating capacity of the furnace

Oversize Factor_{heat} = the oversize factor of the furnace, assumed to be 0.65 (2)

HDD = the heating degree-days of the climate zone, see Table 1

T_{indoor} = the temperature of the indoor conditioned space, assumed to be 65 F

T_{design} = the equipment design temperature of the climate zone, see Table 2

Heat_{Base} = the efficiency of the standard efficiency replacement equipment expressed as a decimal (0-1). If unknown, use typical

Heat_{Eff} = the efficiency of the high efficiency replacement equipment expressed as a decimal (0-1). If unknown, use typical value

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (kBTU)	Energy Factor 0.92	Energy Factor 0.93	Energy Factor 0.94	Energy Factor 0.95	Energy Factor 0.96	Energy Factor 0.97
30,000	8.5	9.0	9.5	10.0	10.5	10.9
35,000	9.9	10.5	11.1	11.6	12.2	12.7
40,000	11.3	12.0	12.7	13.3	13.9	14.6
45,000	12.7	13.5	14.2	15.0	15.7	16.4
50,000	14.2	15.0	15.8	16.6	17.4	18.2
55,000	15.6	16.5	17.4	18.3	19.2	20.0
60,000	17.0	18.0	19.0	20.0	20.9	21.9
65,000	18.4	19.5	20.6	21.6	22.7	23.7

South Dakota Natural Gas Commercial Furnaces - Energy Savings Table

70,000	19.8	21.0	22.2	23.3	24.4	25.5
75,000	21.2	22.5	23.7	25.0	26.2	27.3
80,000	22.6	24.0	25.3	26.6	27.9	29.1
85,000	24.1	25.5	26.9	28.3	29.6	31.0
90,000	25.5	27.0	28.5	30.0	31.4	32.8
95,000	26.9	28.5	30.1	31.6	33.1	34.6
100,000	28.3	30.0	31.7	33.3	34.9	36.4
105,000	29.7	31.5	33.2	34.9	36.6	38.2
110,000	31.1	33.0	34.8	36.6	38.4	40.1
115,000	32.5	34.5	36.4	38.3	40.1	41.9
120,000	34.0	36.0	38.0	39.9	41.8	43.7
125,000	35.4	37.5	39.6	41.6	43.6	45.5
130,000	36.8	39.0	41.2	43.3	45.3	47.4
135,000	38.2	40.5	42.7	44.9	47.1	49.2
140,000	39.6	42.0	44.3	46.6	48.8	51.0
145,000	41.0	43.5	45.9	48.3	50.6	52.8
150,000	42.5	45.0	47.5	49.9	52.3	54.6
155,000	43.9	46.5	49.1	51.6	54.0	56.5
160,000	45.3	48.0	50.6	53.2	55.8	58.3
165,000	46.7	49.5	52.2	54.9	57.5	60.1
170,000	48.1	51.0	53.8	56.6	59.3	61.9
175,000	49.5	52.5	55.4	58.2	61.0	63.7
180,000	50.9	54.0	57.0	59.9	62.8	65.6
185,000	52.4	55.5	58.6	61.6	64.5	67.4
190,000	53.8	57.0	60.1	63.2	66.3	69.2
195,000	55.2	58.5	61.7	64.9	68.0	71.0
200,000	56.6	60.0	63.3	66.6	69.7	72.9

South Dakota Natural Gas Commercial Furnaces - Energy Savings Table

New Choose Replacement or New from Drop-Down Menu to the left

Calculator

Furnace Size (BTU) 75,000
 Heating Efficiency 95%
 Savings (MMBTU) 12.4

$$\text{Gas Energy Heating Savings (MMBTU/yr)} = (\text{kBtu/hr_heat}) \times (\text{HDD}) \times (24 \text{ Hrs/Day}) \times (\text{Oversize Factor_heat}) \times [1 / (T_indoor - T_design)] \times (1 / \text{Heat_Base} - 1 / \text{Heat_Eff}) \times (1 \text{ MMBTU} / 1000000 \text{ BTU})$$

Where:

kBtu/h_heat = the nominal rating of the heating capacity of the furnace

Oversize Factor_heat = the oversize factor of the furnace, assumed to be 0.65 (2)

HDD = the heating degree-days of the climate zone, see Table 1

T_indoor = the temperature of the indoor conditioned space, assumed to be 65 F

T_design = the equipment design temperature of the climate zone, see Table 2

Heat_Base = the efficiency of the standard efficiency replacement equipment expressed as a decimal (0-1). If unknown, use typical

Heat_Eff = the efficiency of the high efficiency replacement equipment expressed as a decimal (0-1). If unknown, use typical value

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (kBTU)	Energy Factor 0.92	Energy Factor 0.93	Energy Factor 0.94	Energy Factor 0.95	Energy Factor 0.96	Energy Factor 0.97
30,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	5.4	5.9	6.3
35,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	6.3	6.8	7.4
40,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	7.2	7.8	8.4
45,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	8.1	8.8	9.5
50,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	9.0	9.8	10.6
55,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	9.9	10.8	11.6
60,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	10.8	11.7	12.7
65,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	11.7	12.7	13.7

South Dakota Natural Gas Commercial Furnaces - Energy Savings Table

70,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	12.6	13.7	14.8
75,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	13.5	14.7	15.8
80,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	14.4	15.6	16.9
85,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	15.3	16.6	17.9
90,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	16.2	17.6	19.0
95,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	17.1	18.6	20.1
100,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	18.0	19.6	21.1
105,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	18.9	20.5	22.2
110,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	19.8	21.5	23.2
115,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	20.7	22.5	24.3
120,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	21.6	23.5	25.3
125,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	22.5	24.4	26.4
130,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	23.4	25.4	27.4
135,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	24.3	26.4	28.5
140,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	25.1	27.4	29.6
145,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	26.0	28.4	30.6
150,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	26.9	29.3	31.7
155,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	27.8	30.3	32.7
160,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	28.7	31.3	33.8
165,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	29.6	32.3	34.8
170,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	30.5	33.2	35.9
175,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	31.4	34.2	36.9
180,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	32.3	35.2	38.0
185,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	33.2	36.2	39.1
190,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	34.1	37.2	40.1
195,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	35.0	38.1	41.2
200,000	Doesn't Qualify	Doesn't Qualify	Doesn't Qualify	35.9	39.1	42.2

South Dakota Natural Gas Commercial Furnaces - Energy Savings Table

Replacement Choose Replacement or New from Drop-Down Menu to the left

Calculator

Furnace Size (BTU) 75,000
 Heating Efficiency 95%
Savings (MMBTU) 23.0

$$\text{Gas Energy Heating Savings (MMBTU/yr)} = (\text{kBtu/hr}_{\text{heat}}) \times (\text{HDD}) \times (24 \text{ Hrs/Day}) \times (\text{Oversize Factor}_{\text{heat}}) \times [1 / (T_{\text{indoor}} - T_{\text{design}})] \times (1 / \text{Heat}_{\text{Base}} - 1 / \text{Heat}_{\text{Eff}}) \times (1 \text{ MMBTU} / 1000000 \text{ BTU})$$

Where:

kBtu/h_{heat} = the nominal rating of the heating capacity of the furnace

Oversize Factor_{heat} = the oversize factor of the furnace, assumed to be 0.65 (2)

HDD = the heating degree-days of the climate zone, see Table 1

T_{indoor} = the temperature of the indoor conditioned space, assumed to be 65 F

T_{design} = the equipment design temperature of the climate zone, see Table 2

Heat_{Base} = the efficiency of the standard efficiency replacement equipment expressed as a decimal (0-1). If unknown, use typical

Heat_{Eff} = the efficiency of the high efficiency replacement equipment expressed as a decimal (0-1). If unknown, use typical value

Source: MN OES Deemed Savings Database adjusted for South Dakota weather

Furnace Size (kBTU)	Energy Factor 0.92	Energy Factor 0.93	Energy Factor 0.94	Energy Factor 0.95	Energy Factor 0.96	Energy Factor 0.97
30,000	8.5	9.0	9.5	10.0	10.5	10.9
35,000	9.9	10.5	11.1	11.6	12.2	12.7
40,000	11.3	12.0	12.7	13.3	13.9	14.6
45,000	12.7	13.5	14.2	15.0	15.7	16.4
50,000	14.2	15.0	15.8	16.6	17.4	18.2
55,000	15.6	16.5	17.4	18.3	19.2	20.0
60,000	17.0	18.0	19.0	20.0	20.9	21.9
65,000	18.4	19.5	20.6	21.6	22.7	23.7

South Dakota Natural Gas Commercial Furnaces - Energy Savings Table

70,000	19.8	21.0	22.2	23.3	24.4	25.5
75,000	21.2	22.5	23.7	25.0	26.2	27.3
80,000	22.6	24.0	25.3	26.6	27.9	29.1
85,000	24.1	25.5	26.9	28.3	29.6	31.0
90,000	25.5	27.0	28.5	30.0	31.4	32.8
95,000	26.9	28.5	30.1	31.6	33.1	34.6
100,000	28.3	30.0	31.7	33.3	34.9	36.4
105,000	29.7	31.5	33.2	34.9	36.6	38.2
110,000	31.1	33.0	34.8	36.6	38.4	40.1
115,000	32.5	34.5	36.4	38.3	40.1	41.9
120,000	34.0	36.0	38.0	39.9	41.8	43.7
125,000	35.4	37.5	39.6	41.6	43.6	45.5
130,000	36.8	39.0	41.2	43.3	45.3	47.4
135,000	38.2	40.5	42.7	44.9	47.1	49.2
140,000	39.6	42.0	44.3	46.6	48.8	51.0
145,000	41.0	43.5	45.9	48.3	50.6	52.8
150,000	42.5	45.0	47.5	49.9	52.3	54.6
155,000	43.9	46.5	49.1	51.6	54.0	56.5
160,000	45.3	48.0	50.6	53.2	55.8	58.3
165,000	46.7	49.5	52.2	54.9	57.5	60.1
170,000	48.1	51.0	53.8	56.6	59.3	61.9
175,000	49.5	52.5	55.4	58.2	61.0	63.7
180,000	50.9	54.0	57.0	59.9	62.8	65.6
185,000	52.4	55.5	58.6	61.6	64.5	67.4
190,000	53.8	57.0	60.1	63.2	66.3	69.2
195,000	55.2	58.5	61.7	64.9	68.0	71.0
200,000	56.6	60.0	63.3	66.6	69.7	72.9