

# TECHNICAL GUIDE

## 80% STANDARD ECM SINGLE STAGE MULTI-POSITION RESIDENTIAL GAS FURNACES

### Low NOx MODELS

### MODELS: RGF1L\*E

#### NATURAL GAS

40 - 130 MBH INPUT



Due to continuous product improvement, specifications are subject to change without notice.

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#### **WARRANTY SUMMARY**

A 20-year limited warranty on heat exchangers in residential applications.

A 10-year warranty on the heat exchanger in commercial applications.

Standard 5-year limited Parts warranty.

**Extended lifetime heat exchanger and 10-year limited parts warranty when product is registered online within 90 days of purchase for replacement or closing for new home construction.**

See Limited Warranty certificate in Users Information Manual for details.

## DESCRIPTION

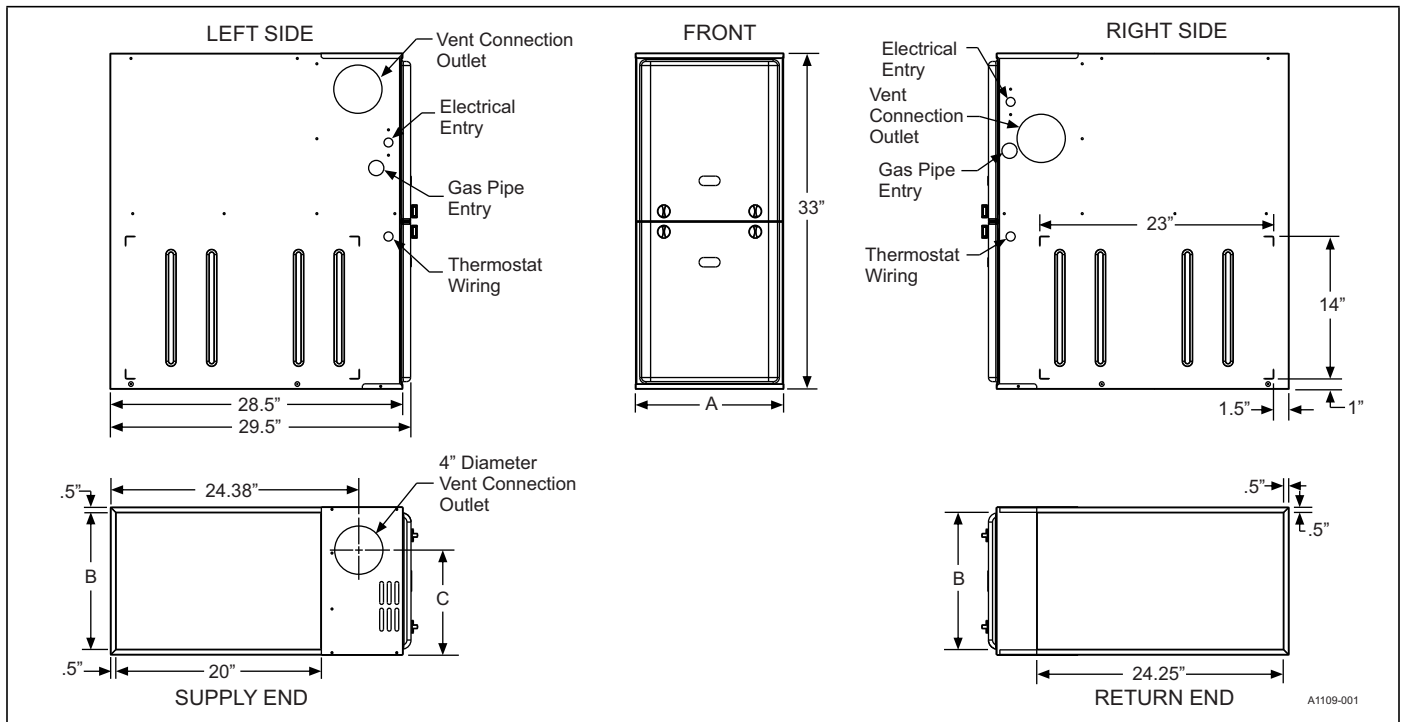
These compact units employ induced combustion, reliable hot surface ignition, and high heat transfer aluminized tubular heat exchangers. The units are factory shipped for installation in upflow applications and may be converted for horizontal or downflow applications.

These furnaces are designed for residential installation in a basement, closet, alcove, attic, recreation room, or garage and are also ideal for commercial applications. All units are factory assembled, wired, and tested to assure safe, dependable, and economical installation and operation.

These units are Category I listed and may be common vented with another gas appliance as allowed by the National Fuel Gas Code.

## FEATURES

- Easily applied in upflow, horizontal left or right, or downflow installation with minimal conversion necessary.
- Compact, easy to install, ideal height 33" tall cabinet.
- Blower-off delay for cooling SEER improvement.
- Easy access to controls to connect power/control wiring.
- Built-in, high level self diagnostics with fault code displays standard on integrated control module for reliable operation.
- Low unit amp requirement for easy replacement application.
- All models are convertible to use propane (LP) gas.
- Electronic Hot Surface Ignition saves fuel cost with increased dependability and reliability.
- 100% shut off main gas valve for extra safety.
- 5 speed direct drive Standard ECM blower motor.
- 24V, 40 VA control transformer and blower relay supplied for add-on cooling.
- Hi-tech tubular aluminized steel primary heat exchanger.
- Timed on, adjustable off blower capability for maximum comfort.
- Blower door safety switch.
- Solid removable bottom panel allows easy conversion.
- Low NOx models have been designed to meet specific code requirements.
- Airflow leakage less than 1% of total airflow at duct performance testing conditions.
- No knockouts to deal with, making installation easier.
- Movable duct connector flanges for application flexibility.
- Quiet inducer operation.
- Inducer rotates for easy conversion of venting options.
- Fully supported blower assembly for easy access and removal of blower.
- External air filters used for maximum flexibility in meeting customers' IAQ needs.
- Venting applications - may be installed as a common vent with other gas-fired appliances or use a masonry chimney.
- 1/4 turn knobs provided for easy door removal.
- High-efficiency blower motor for lower electrical power usage and improved A/C SEER ratings.
- Insulated blower compartment for thermal and acoustic performance.



**Cabinet and Duct Dimensions**

Models	Nominal CFM (m <sup>3</sup> /min)	Cabinet Size	Cabinet Dimensions (Inches)			Approximate Operating Weights
			A	B	C	Lbs
RGF1L040AE12MP12	1200	A	14 1/2	13 3/8	10.3	89
RGF1L060AE12MP12	1200	A	14 1/2	13 3/8	10.3	94
RGF1L080BE12MP12	1200	B	17 1/2	16 3/8	11.8	103
RGF1L080CE16MP12	1600	C	21	19 7/8	13.6	116
RGF1L080CE20MP12	2000	C	21	19 7/8	13.6	121
RGF1L100BE12MP12	1200	B	17 1/2	16 3/8	11.8	108
RGF1L100CE16MP12	1600	C	21	19 7/8	13.6	120
RGF1L100CE20MP12	2000	C	21	19 7/8	13.6	124
RGF1L120CE16MP12	1600	C	21	19 7/8	13.6	125
RGF1L120CE20MP12	2000	C	21	19 7/8	15.8	131
RGF1L130DE20MP12	2000	D	24 1/2	23 3/8	17.5	137

## Ratings &amp; Physical / Electrical Data

Models	Input	Output	AFUE	Air Temp. Rise	Max. Outlet Air Temp	Blower		Blower Size	Recommended Fuse or Circuit Breaker Amps	Total Unit Amps	Gas Pipe Connection, NPT
	MBH	MBH		°F	°F	HP	Amps				
RGF1L040AE12MP12	40	32	80.0	20-50	190	1/2	6.4	11 x 8	15	8.2	1/2"
RGF1L060AE12MP12	60	48	80.0	30-60	190	1/2	6.4	11 x 8	15	8.2	1/2"
RGF1L080BE12MP12	80	64	80.0	35-65	190	1/2	6.4	11 x 8	15	8.7	1/2"
RGF1L080CE16MP12	80	64	80.0	30-60	190	3/4	8.4	11 x 10	15	10.7	1/2"
RGF1L080CE20MP12	80	64	80.0	25-55	190	1	12.2	11 x 11	20	14.5	1/2"
RGF1L100BE12MP12	100	80	80.0	40-70	190	1/2	6.4	11 x 8	15	8.7	1/2"
RGF1L100CE16MP12	100	80	80.0	40-70	190	3/4	8.4	11 x 10	15	10.7	1/2"
RGF1L100CE20MP12	100	80	80.0	25-55	190	1	12.2	11 x 11	20	14.5	1/2"
RGF1L120CE16MP12	120	96	80.0	40-70	190	3/4	8.4	11 x 10	15	10.6	1/2"
RGF1L120CE20MP12	120	96	80.0	35-65	190	1	12.2	11 x 11	20	14.4	1/2"
RGF1L130DE20MP12	130	104	80.0	35-65	190	1	12.2	11 x 11	20	14.4	1/2"

Annual Fuel Utilization Efficiency (AFUE) numbers are determined in accordance with DOE Test procedures.

Wire size and over current protection must comply with the National Electrical Code (NFPA-70-latest edition) and all local codes.

The furnace shall be installed so that the electrical components are protected from water.

## HORIZONTAL SIDEWALL VENTING

For applications where vertical venting is not possible, the only approved method of horizontal venting is the use of an auxiliary power vent. Auxiliary power venters must be approved by CSA, UL, or other recognized safety agencies. Follow all application and installation details provided by the manufacturer of the power vent.

## FILTER PERFORMANCE



*In downflow furnace arrangement, the filter must be located a minimum of 12" from the return air inlet of furnace.*

The airflow capacity data published in the "Blower Performance" table shown represents blower performance WITHOUT filters.

All applications of these furnaces require the use of field installed air filters. All filter media and mounting hardware or provisions must be field installed external to the furnace cabinet. DO NOT attempt to install any filters inside the furnace.

## NOTICE

*Single side return above 1800 CFM is approved as long as the filter velocity does not exceed filter manufacturer's recommendation and a transition is used to allow use on a 20x25 filter.*

## Recommended Filter Sizes

CFM (m <sup>3</sup> /min)	Cabinet Size	Side (in)	Bottom (in)
1200 (34.0)	A	16 x 25	14 x 25
1200 (34.0)	B	16 x 25	16 x 25
1600 (45.3)	C	16 x 25	20 x 25
2000 (56.6)	C	(2) 16 x 25	20 x 25
2000 (56.6)	D	(2) 16 x 25	22 x 25

- Air velocity through throwaway type filters may not exceed 300 feet per minute (91.4 m/min). All velocities over this require the use of high velocity filters.
- Do not exceed 1800 CFM using a single side return and a 16x25 filter. For CFM greater than 1800, you may use two side returns or one side and the bottom or one return with a transition to allow use of a 20x25 filter.

## Unit Clearances to Combustibles (All dimensions in inches, and all surfaces identified with the unit in an upflow configuration)

Application	Top	Front	Rear	Left Side	Right Side	Flue	Floor/Bottom	Closet	Alcove	Attic	Line Contact
Upflow	1	6	0	0	3	6	Combustible	Yes	Yes	Yes	No
Upflow B-Vent	1	3	0	0	0	1	Combustible	Yes	Yes	Yes	No
Downflow	1	6	0	0	3	6	1 <sup>1</sup>	Yes	Yes	Yes	No
Downflow B-Vent	1	3	0	0	0	1	1 <sup>1</sup>	Yes	Yes	Yes	No
Horizontal	1	6	0	0	3	6	Combustible	No	Yes	Yes	Yes <sup>2</sup>
Horizontal B-Vent	1	3	0	0	0	1	Combustible	No	Yes	Yes	Yes <sup>2</sup>

1. Special floor base or air conditioning coil required for use on combustible floor.

2. Line contact only permitted between lines formed by the intersection of the rear panel and side panel (top in horizontal position) of the furnace jacket and building joists, studs, or framing.

## ACCESSORIES

**Propane (LP) Conversion Kit** - This accessory conversion kit may be used to convert natural gas units for LP operation.

S1-1NP0347 - All Models except 130,000 BTU input

S1-1NP0501 - 130,000 BTU input only

**LP Stainless Steel Burner Kit** - This accessory conversion kit may be used to convert existing burners to stainless steel burners for LP use only.

S1-32926889000 - All LP Models

**Natural (NAT) Gas Stainless Steel Burner Kit** - This accessory kit may be used to replace existing burners with stainless steel burners for NAT gas use only.

S1-32924441000 - All NAT gas Models

**Side Return Filter Racks** - The S1-1SR0200 Kit accommodates a 1", 2", or 4" filter. The S1-1SR0402 Kit accommodates a 1" filter only.

S1-1SR0200 - All Models

S1-1SR0402 - All Models

**Bottom Return Filter Racks** - The S1-1BR05\* series are galvanized steel filter racks. The S1-1BR06\* series are pre-painted steel filter racks to match the appearance of the furnace cabinet. The S1-1BR05\* and S1-1BR06\* series filter racks accommodate a 1", 2", or 4" filter.

S1-1BR0514 or S1-1BR0614 - For 14-1/2" cabinets

S1-1BR0517 or S1-1BR0617 - For 17-1/2" cabinets

S1-1BR0521 or S1-1BR0621 - For 21" cabinets

S1-1BR0524 or S1-1BR0624 - for 24-1/2" cabinets

**Masonry Chimney Kits** - This accessory kit allows upflow 80% models to be vented into a tile-lined masonry chimney.

S1-1CK0604 - All 80% Non-modulating Models

**Combustible Floor Base Kit** - These kits are required to prevent potential overheating situations when the furnaces are installed in downflow applications directly onto combustible flooring material. These kits are also required in any applications where the furnace is installed in a downflow configuration without an indoor coil and where the combustible floor base kit provides access for combustible airflow.

S1-1CB0514 - For 14-1/2" cabinets

S1-1CB0517 - For 17-1/2" cabinets

S1-1CB0521 - For 21" cabinets

S1-1CB0524 - for 24-1/2" cabinets

**High Altitude Pressure Switches** - For installation where the altitude is less than 5,000 feet, it is not required that the pressure switch be changed. For altitudes above 5,000 feet, see kits below.

S1-1PS3301 - 040, 060, 080, 120

S1-1PS3302 - 100, 130

**Thermostats** - Compatible thermostat controls are available through accessory sourcing. For optimum performance, these outdoor units are fully compatible with our residential touch screen thermostat with proprietary (patent-pending) hexagon interface. For more information, see the thermostat section of the Product Equipment Catalog.

S1-THXU280 - All Models

## Blower Performance CFM - Any Position (without filter)

Models	Speed	Airflow Data (SCFM) <sup>1,2</sup>							
		Ext. Static Pressure (in. H2O)							
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
RGF1L040AE12MP12	High	1408	1358	1313	1275	1227	1180	1133	1088
	Medium High	1195	1153	1093	1043	1005	957	904	850
	Medium	1053	1008	954	897	851	797	755	702
	Medium Low	947	892	838	783	738	684	626	582
	Low	649	697	682	630	575	518	471	422
RGF1L060AE12MP12	High	1343	1309	1279	1238	1193	1163	1123	1075
	Medium High	1149	1107	1074	1031	993	942	900	857
	Medium	997	959	911	877	825	777	737	697
	Medium Low	921	878	831	782	731	696	651	599
	Low	838	784	742	695	648	601	551	518
RGF1L080BE12MP12	High	1457	1421	1387	1358	1325	1289	1256	1220
	Medium High	1336	1302	1269	1233	1198	1163	1124	1083
	Medium	1118	1088	1052	1016	973	945	885	841
	Medium Low	994	957	926	880	839	786	734	686
	Low	811	770	725	673	625	572	521	467
RGF1L080CE16MP12	High	1784	1746	1704	1660	1607	1556	1504	1466
	Medium High	1444	1405	1354	1304	1252	1210	1157	1114
	Medium	1253	1211	1157	1111	1064	1015	969	908
	Medium Low	1083	1033	979	924	872	816	755	693
	Low	902	849	787	724	659	593	538	475
RGF1L080CE20MP12	High	2200	2162	2110	2061	2021	1981	1931	1970
	Medium High	1980	1939	1892	1846	1804	1758	1701	1652
	Medium	1734	1687	1645	1592	1547	1504	1456	1408
	Medium Low	1597	1547	1504	1457	1410	1357	1310	1256
	Low	1413	1362	1304	1247	1195	1148	1095	1046
RGF1L100BE12MP12	High	1360	1321	1288	1259	1223	1182	1146	1105
	Medium High	1197	1154	1127	1085	1046	1005	957	912
	Medium	1016	981	945	899	859	805	761	710
	Medium Low	916	878	839	794	743	691	643	595
	Low	781	741	696	643	594	535	482	433
RGF1L100CE16MP12	High	1795	1755	1715	1673	1631	1587	1533	1479
	Medium High	1464	1417	1364	1325	1290	1227	1188	1138
	Medium	1217	1171	1120	1072	1021	978	924	869
	Medium Low	1062	1011	956	910	858	801	738	669
	Low	905	847	784	732	668	601	540	465
RGF1L100CE20MP12	High	2219	2179	2136	2095	2044	2001	1952	1912
	Medium High	1994	1951	1911	1872	1820	1774	1733	1678
	Medium	1727	1687	1648	1595	1558	1502	1456	1406
	Medium Low	1618	1574	1528	1480	1432	1383	1337	1288
	Low	1410	1364	1316	1255	1206	1164	1109	1042
RGF1L120CE16MP12	High	1765	1721	1684	1635	1606	1542	1503	1442
	Medium High	1429	1384	1340	1292	1256	1209	1164	1114
	Medium	1207	1169	1119	1077	1028	977	930	888
	Medium Low	1055	1018	955	907	862	810	761	705
	Low	885	834	783	733	675	618	544	500
RGF1L120CE20MP12	High	2235	2199	2148	2108	2066	2034	1984	1932
	Medium High	1960	1901	1860	1819	1776	1723	1682	1642
	Medium	1693	1640	1593	1557	1504	1455	1413	1365
	Medium Low	1580	1533	1488	1444	1394	1342	1296	1244
	Low	1417	1362	1313	1269	1223	1169	1120	1079

For notes, see Page 6.

**Blower Performance CFM - Any Position (without filter) (Continued)**

Models	Speed	Airflow Data (SCFM) <sup>1,2</sup>							
		Ext. Static Pressure (in. H <sub>2</sub> O)							
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
RGF1L130DE20MP12	High	2229	2182	2133	2088	2047	1996	1946	1893
	Medium High	2009	1968	1925	1881	1829	1778	1737	1679
	Medium	1818	1765	1729	1675	1616	1580	1540	1480
	Medium Low	1569	1520	1472	1427	1376	1329	1281	1237
	Low	1448	1394	1341	1275	1221	1183	1131	1085

**NOTES:**

1. Airflow expressed in standard cubic feet per minute (SCFM).
2. Motor voltage at 115 V.
3. Not all speeds are recommended for use as heating speeds.