

TECHNICAL GUIDE

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95.0% AFUE STANDARD ECM SINGLE STAGE MULTI-POSITION RESIDENTIAL GAS FURNACES

MODELS: TM9E

NATURAL GAS
40–120 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

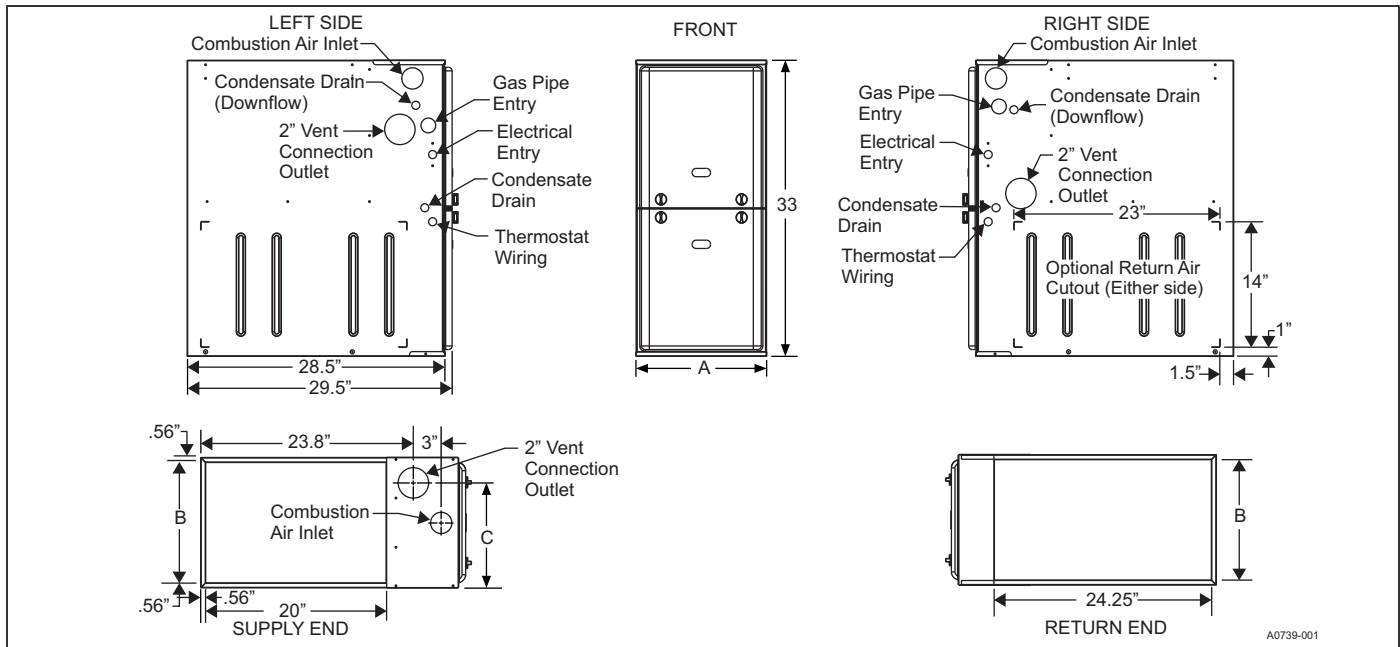
These compact units employ induced combustion, reliable hot surface ignition, and high heat transfer aluminized tubular heat exchangers. The units are factory shipped for installation in upflow or horizontal applications and can be converted for downflow applications.

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 ensure safe, dependable, and economical installation and operation.

These units are Category IV, National Fuel Gas Code and can be vented either through side wall or roof applications using approved plastic combustion air and vent piping. Approved plastic combustion air and vent piping include Selkirk Polyflue, Duravent Polypro, and Centrotherm Innoflue polypropylene venting systems.

FEATURES

- Easily applied in upflow, horizontal left or right, or downflow installation with minimal conversion necessary.
- Compact, easy to install, ideal height 33 in. 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 current 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 high efficiency motor.
- 24 V, 40 VA control transformer and blower relay supplied for add-on cooling.
- Hi-tech tubular aluminized steel primary heat exchanger.
- Secondary heat exchanger made of corrosion resistant stainless steel materials.
- Timed on, adjustable off blower capability for maximum comfort.
- Blower door safety switch.
- Solid removable bottom panel allows easy conversion.
- Airflow leakage less than 1% of nominal 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.
- Protection included from air intake, exhaust vent, or condensate blockage.
- Patented self priming internal condensate trap design for easy installation.
- Venting applications - can be installed as a two-pipe (sealed combustion) or single-pipe vent (using indoor combustion air).
- No special vent termination required.
- 1/4 turn knobs provided for easy door removal.
- High-efficiency blower motor for lower electrical power usage and improved AC SEER ratings.
- Insulated blower compartment for terminal and acoustic performance.



Cabinet and Duct Dimensions

| Model | Nominal CFM (m ³ /min) | Cabinet Size | Cabinet Dimensions (in.) | | | Approximate Operating Weights (lb) |
|----------------|-----------------------------------|--------------|--------------------------|--------|--------|------------------------------------|
| | | | A | B | C | |
| TM9E040A10MP12 | 1000 | A | 14-1/2 | 13-3/8 | 11-3/4 | 113 |
| TM9E060A10MP12 | 1200 | A | 14-1/2 | 13-3/8 | 11-3/4 | 118 |
| TM9E060B12MP12 | 1200 | B | 17-1/2 | 16-3/8 | 13-1/4 | 122 |
| TM9E080B12MP12 | 1200 | B | 17-1/2 | 16-3/8 | 14-3/4 | 126 |
| TM9E080C16MP12 | 1600 | C | 21 | 19-7/8 | 16-1/2 | 136 |
| TM9E080C20MP12 | 2000 | C | 21 | 19-7/8 | 18-1/4 | 139 |
| TM9E100C16MP12 | 1600 | C | 21 | 19-7/8 | 18-1/4 | 142 |
| TM9E100C20MP12 | 2000 | C | 21 | 19-7/8 | 18-1/4 | 145 |
| TM9E120D20MP12 | 2000 | D | 24-1/2 | 23-3/8 | 21-3/4 | 156 |

Ratings and Physical/Electrical Data

| Model | Input | Output | AFUE | Air Temperature Rise | Maximum Outlet Air Temperature | Blower | | Blower Size | Recommended Fuse or Circuit Breaker | Total Unit | Gas Pipe Connection, NPT |
|----------------|-------|--------|------|----------------------|--------------------------------|--------|------|-------------|-------------------------------------|------------|--------------------------|
| | MBH | MBH | % | °F | °F | HP | A | in. | A | A | in. |
| TM9E040A10MP12 | 40 | 38 | 95.0 | 30-60 | 190 | 1/2 | 6.8 | 11 x 8 | 15 | 10.4 | 1/2 |
| TM9E060A10MP12 | 60 | 57 | 95.0 | 35-65 | 190 | 1/2 | 6.8 | 11 x 8 | 15 | 10.4 | 1/2 |
| TM9E060B12MP12 | 60 | 57 | 95.0 | 30-60 | 190 | 1/2 | 6.8 | 11 x 8 | 15 | 10.4 | 1/2 |
| TM9E080B12MP12 | 80 | 76 | 95.0 | 40-70 | 190 | 1/2 | 6.8 | 11 x 8 | 15 | 10.4 | 1/2 |
| TM9E080C16MP12 | 80 | 76 | 95.0 | 40-70 | 190 | 5/8 | 8.0 | 11 x 10 | 15 | 11.6 | 1/2 |
| TM9E080C20MP12 | 80 | 76 | 95.0 | 30-60 | 190 | 1 | 10.9 | 11 x 11 | 20 | 14.5 | 1/2 |
| TM9E100C16MP12 | 100 | 95 | 95.0 | 40-70 | 190 | 5/8 | 8.0 | 11 x 10 | 15 | 11.6 | 1/2 |
| TM9E100C20MP12 | 100 | 95 | 95.0 | 35-65 | 190 | 1 | 10.9 | 11 x 11 | 20 | 14.5 | 1/2 |
| TM9E120D20MP12 | 120 | 114 | 95.0 | 45-75 | 190 | 1 | 10.9 | 11 x 11 | 20 | 14.5 | 1/2 |

Notes:

Annual Fuel Utilization Efficiency (AFUE) numbers are determined in accordance with DOE Test procedures. Wire size and overcurrent protection must comply with the National Electrical Code (NFPA-70-latest edition) and all local codes. The furnace must be installed so the electrical components are protected from water.

FILTER PERFORMANCE

The airflow capacity data in the Blower Performance CFM - Any Position (Without Filters) table 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.

Note: 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 of a 20 x 25 filter.

Recommended Filter Sizes (High velocity 600 FPM)

| CFM (m ³ /min) | Cabinet Size | Side (in.) | Bottom (in.) |
|---------------------------|--------------|-------------|--------------|
| 800 (22.6) | A | 16 x 25 | 14 x 25 |
| 1000 (28.3) | A | 16 x 25 | 14 x 25 |
| 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 |

Notes:

Air velocity through throwaway filters must not exceed 300 ft/min (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 16 x 25 filter. For CFM greater than 1800, you can use two side returns, or one side and the bottom, or one return with a transition to allow use of a 20 x 25 filter.

Unit Clearances to Combustibles

| Application | Upflow | Downflow | Horizontal |
|--------------------|-------------|--------------------------|-------------|
| Top | 1 in. | 0 in. | 0 in. |
| Vent | 0 in. | 0 in. | 0 in. |
| Rear | 0 in. | 0 in. | 0 in. |
| Side | 0 in. | 0 in. | 1 in. |
| Front ¹ | 0 in. | 0 in. | 0 in. |
| Floor | Combustible | Combustible ² | Combustible |
| Closet | Yes | Yes | Yes |
| Line Contact | No | No | Yes |

1. 24 in. clearance in front and 18 in. on side is recommended for service access.

2. A special sub-base is required for downflow applications on combustible floors.

Note: All furnaces are approved for alcove and attic installation.

ACCESSORIES

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

S1-1NP0347 - All models

S1-1NP0820 - Same as S1-1NP0347 except includes stainless steel LP burners

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

S1-32926889000 - All LP models

Twinning Kit Accessory - For installation with two identical model furnaces with a common duct system and properly sized heating and cooling equipment.

S1-33103764000

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

S1-32924441000 - All NAT gas models

Concentric Vent Termination - For use through rooftop, side-wall. Allows combustion air to enter and exhaust to exit through single common hole. Eliminates unsightly elbows for a cleaner installation.

S1-1CT0302 (2 in.) and S1-1CT0302-636 (2 in.)

S1-1CT0303 (3 in.) and S1-1CT0303-636 (3 in.)

Sidewall Vent Termination Kit - For use on sidewall, two-pipe installations only. Provides a more attractive termination for locations where the terminal is visible on the side of the home.

S1-1HT0901 (3 in.)

S1-1HT0902 (2 in.)

Condensate Neutralizer Kit - Neutralizer cartridge has 1/2 in. plastic tube fittings for installation in the drain line. Calcium carbonate refill media is also available from the Source 1 Parts (P/N 026-30228-000).

S1-1NK0301

Side Return Filter Racks - The S1-1SR0200 kit accommodates a 1 in., 2 in., or 4 in. filter. The S1-1SR0402 Kit accommodates a 1 in. 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 in., 2 in., or 4 in. filter.

S1-1BR0514 or S1-1BR0614 - For 14-1/2 in. cabinets

S1-1BR0517 or S1-1BR0617 - For 17-1/2 in. cabinets

S1-1BR0521 or S1-1BR0621 - For 21 in. cabinets

S1-1BR0524 or S1-1BR0624 - For 24-1/2 in. cabinets

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 in. cabinets

S1-1CB0517 - For 17-1/2 in. cabinets

S1-1CB0521 - For 21 in. cabinets

S1-1CB0524 - For 24-1/2 in. cabinets

High Altitude Pressure Switches - For installation where the altitude is less than 5,000 ft, it is not required to change the pressure switch. For altitudes above 5,000 ft, see the kits below.

S1-1PS3306 - 060

S1-1PS3307 - 040, 080

S1-1PS3302 - 100, 120

Thermostats - Compatible thermostat controls are available through accessory sourcing. For optimum performance, these outdoor units are fully compatible with our residential Hx™ Touch Screen Thermostats available through Source 1. For more information, see the thermostat section of the Product Equipment Catalog.

Blower Performance CFM - Any Position (Without Filter)

| Models | Speed | Airflow Data (SCFM) ^{1,2} | | | | | | | |
|----------------|-------------|---|------|------|------|------|------|------|------|
| | | External Static Pressure (in. H ₂ O) | | | | | | | |
| | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 |
| TM9E040A10MP12 | High | 1172 | 1147 | 1116 | 1083 | 1035 | 984 | 933 | 870 |
| | Medium High | 952 | 919 | 896 | 865 | 839 | 809 | 780 | 765 |
| | Medium | 882 | 861 | 824 | 802 | 771 | 746 | 709 | 685 |
| | Medium Low | 754 | 716 | 688 | 650 | 610 | 588 | 551 | 523 |
| | Low | 688 | 648 | 619 | 584 | 541 | 518 | 481 | 446 |
| TM9E060A10MP12 | High | 1239 | 1209 | 1175 | 1143 | 1124 | 1095 | 1066 | 1019 |
| | Medium High | 1142 | 1102 | 1080 | 1050 | 1019 | 989 | 960 | 924 |
| | Medium | 971 | 935 | 909 | 869 | 839 | 805 | 761 | 731 |
| | Medium Low | 915 | 891 | 848 | 818 | 776 | 744 | 708 | 691 |
| | Low | 773 | 739 | 687 | 655 | 604 | 572 | 527 | 496 |
| TM9E060B12MP12 | High | 1342 | 1316 | 1290 | 1268 | 1243 | 1219 | 1172 | 1116 |
| | Medium High | 1297 | 1267 | 1247 | 1217 | 1189 | 1159 | 1129 | 1087 |
| | Medium | 1165 | 1139 | 1108 | 1080 | 1051 | 1020 | 983 | 948 |
| | Medium Low | 1027 | 995 | 965 | 936 | 894 | 862 | 825 | 778 |
| | Low | 822 | 775 | 740 | 687 | 649 | 605 | 566 | 512 |
| TM9E080B12MP12 | High | 1418 | 1390 | 1364 | 1333 | 1304 | 1281 | 1246 | 1205 |
| | Medium High | 1305 | 1281 | 1244 | 1217 | 1182 | 1149 | 1109 | 1066 |
| | Medium | 1139 | 1112 | 1071 | 1035 | 992 | 951 | 908 | 874 |
| | Medium Low | 1017 | 986 | 948 | 901 | 859 | 819 | 765 | 727 |
| | Low | 885 | 821 | 763 | 711 | 651 | 611 | 560 | 518 |
| TM9E080C16MP12 | High | 1706 | 1678 | 1649 | 1621 | 1602 | 1560 | 1505 | 1437 |
| | Medium High | 1390 | 1344 | 1313 | 1267 | 1235 | 1194 | 1150 | 1109 |
| | Medium | 1212 | 1167 | 1125 | 1086 | 1041 | 996 | 951 | 902 |
| | Medium Low | 1016 | 964 | 914 | 861 | 803 | 734 | 653 | 594 |
| | Low | 920 | 791 | 733 | 666 | 568 | 506 | 448 | 388 |
| TM9E080C20MP12 | High | 2130 | 2086 | 2065 | 2016 | 2001 | 1932 | 1863 | 1775 |
| | Medium High | 1922 | 1894 | 1835 | 1810 | 1771 | 1727 | 1688 | 1627 |
| | Medium | 1684 | 1648 | 1616 | 1559 | 1516 | 1471 | 1429 | 1382 |
| | Medium Low | 1563 | 1528 | 1474 | 1435 | 1392 | 1329 | 1291 | 1244 |
| | Low | 1371 | 1321 | 1281 | 1222 | 1173 | 1131 | 1076 | 1017 |
| TM9E100C16MP12 | High | 1762 | 1733 | 1688 | 1659 | 1625 | 1594 | 1565 | 1512 |
| | Medium High | 1428 | 1386 | 1337 | 1291 | 1245 | 1205 | 1161 | 1114 |
| | Medium | 1225 | 1178 | 1127 | 1083 | 1034 | 988 | 918 | 886 |
| | Medium Low | 1108 | 1059 | 1001 | 948 | 889 | 821 | 764 | 702 |
| | Low | 1022 | 867 | 799 | 732 | 660 | 579 | 521 | 496 |
| TM9E100C20MP12 | High | 2140 | 2100 | 2070 | 2038 | 2006 | 1932 | 1871 | 1786 |
| | Medium High | 1883 | 1854 | 1818 | 1777 | 1720 | 1676 | 1649 | 1590 |
| | Medium | 1671 | 1624 | 1595 | 1557 | 1498 | 1450 | 1407 | 1351 |
| | Medium Low | 1581 | 1525 | 1493 | 1443 | 1394 | 1346 | 1292 | 1253 |
| | Low | 1350 | 1311 | 1244 | 1202 | 1138 | 1098 | 1053 | 978 |
| TM9E120D20MP12 | High | 2159 | 2118 | 2089 | 2050 | 2005 | 1939 | 1856 | 1756 |
| | Medium High | 1941 | 1907 | 1864 | 1824 | 1779 | 1736 | 1688 | 1645 |
| | Medium | 1789 | 1749 | 1714 | 1677 | 1629 | 1586 | 1540 | 1494 |
| | Medium Low | 1643 | 1607 | 1555 | 1515 | 1468 | 1420 | 1380 | 1332 |
| | Low | 1396 | 1343 | 1302 | 1250 | 1190 | 1152 | 1095 | 1034 |

1. Airflow expressed in standard cubic feet per minute (SCFM).

2. Motor voltage at 115 V.

Note: Shaded conditions are not recommended for use as heating speeds.