



## Technical Guide

### 96% AFUE Two Stage Variable Speed ECM Residential Gas Furnaces Multi-position Models: TM9V\*C

Natural Gas

40 MBH to 120 MBH Input



ISO 9001  
Certified Quality  
Management System

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

See Limited Warranty certificate in Users Information Manual for details.

## Description

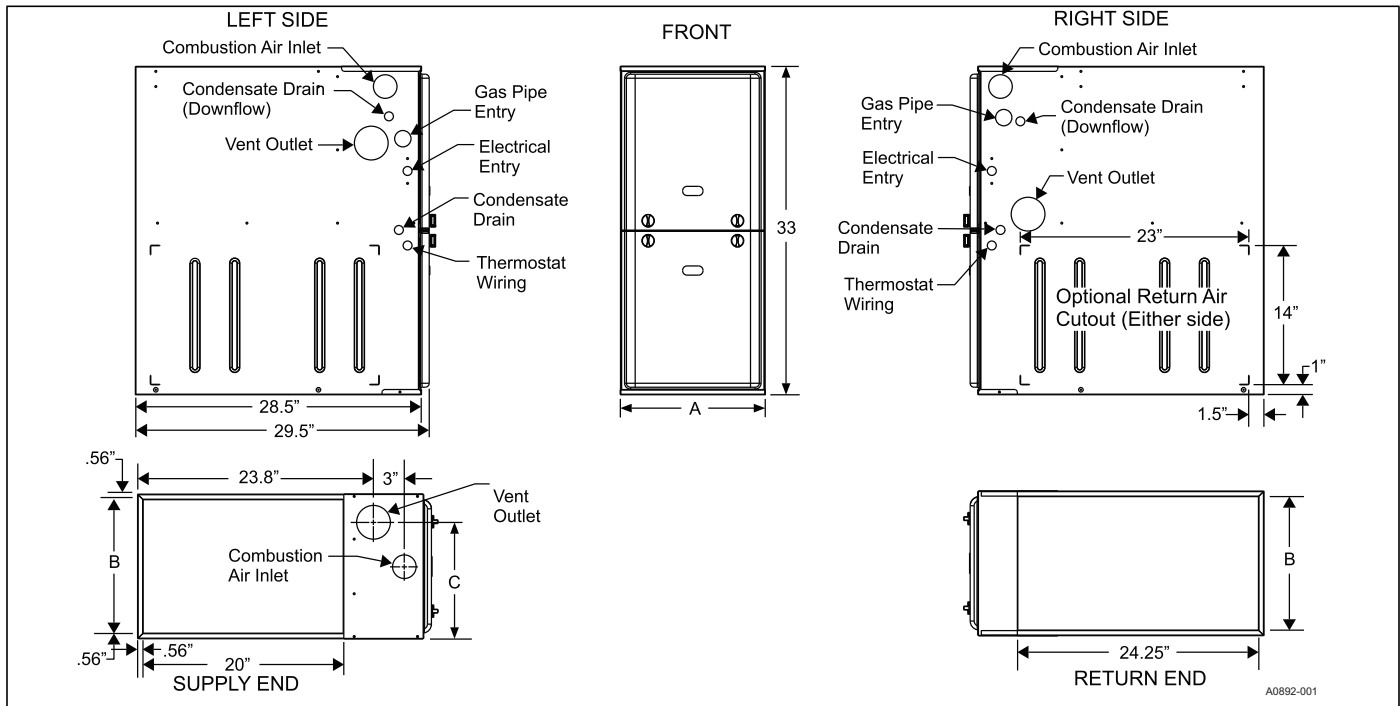
These compact units employ induced combustion, reliable hot surface ignition and high heat transfer aluminized tubular heat exchangers. The units are factory shipped for installation in upflow or horizontal applications and may be converted for downflow applications.

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 assure safe dependable and economical installation and operation.

These units are Category IV, National Fuel Gas Code and may 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 PVC, CPVC, ABS, IPEX System 1738, Selkirk Polyflue, Duravent PolyPro, and Centrotherm InnoFlue polypropylene venting systems.

## Features

- Two-stage heating operation includes two-stage gas valve, two-stage inducer operation, and variable speed ECM blower operation. Adjustable delay timer allows two-stage operation with a single-stage thermostat.
- 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.
- ECM variable speed drive for cooling SEER enhancement, improved comfort with optional airflow delay profiles, and continuous fan options for IAQ performance.
- Easy access to controls to connect power/control wiring.
- Built-in, high level self diagnostics with fault code display.
- 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.
- 24 V, 40 VA control transformer and blower relay supplied for add-on cooling.
- Hi-tech tubular aluminized steel primary heat exchanger with stainless steel tube/aluminum fin secondary heat exchanger for outstanding efficiency.
- Solid removable bottom panel allows easy conversion.
- Airflow leakage less than 1% of nominal airflow for duct performance testing conditions.
- No knockouts, making installation easier.
- Movable duct connector flanges for application flexibility.
- Quiet inducer operation, burner, and blower 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.
- Insulated blower compartment for thermal and acoustic performance.
- 1/4 turn knobs provided for easy independent door removal.
- Internal condensate trap design (patent pending) provides condensate management options and is self priming to prevent nuisance problems.
- Protection included from air intake, exhaust vent or condensate blockage.
- Venting applications may be installed as either two-pipe sealed combustion or single-pipe vent using indoor combustion air.
- Models may be connected as part of a communicating control system using a four-wire connection bus.



**Cabinet and duct dimensions**

Model	Nominal CFM (m <sup>3</sup> /min)	Cabinet size	Cabinet dimensions (in.)			Approximate operating weights
			A	B	C	lb
TM9V040A10MP12C	1000	A	14 1/2	13 3/8	11 3/4	113
TM9V060B12MP12C	1200	B	17 1/2	16 3/8	13 1/4	122
TM9V080B12MP12C	1200	B	17 1/2	16 3/8	13 1/4	126
TM9V080C16MP12C	1600	C	21	19 7/8	16 1/2	136
TM9V100C16MP12C	1600	C	21	19 7/8	18 1/4	142
TM9V100C20MP12C	2000	C	21	19 7/8	18 1/4	145
TM9V120D20MP12C	2000	D	24 1/2	23 3/8	21 3/4	156

**Ratings and physical/electrical data**

Model	Input high/low	Output high/low	Total unit amps	AFUE	High fire air temperature rise	Low fire air temperature rise
	MBH	MBH	A	%	°F	°F
TM9V040A10MP12C	40/26	38/25	9.6	96	30 - 60	20 - 50
TM9V060B12MP12C	60/39	58/37	9.6	96	35 - 65	35 - 65
TM9V080B12MP12C	80/52	77/50	9.6	96	40 - 70	35 - 65
TM9V080C16MP12C	80/52	77/50	11.5	96	35 - 65	35 - 65
TM9V100C16MP12C	100/65	96/62	11.5	96	35 - 65	30 - 65
TM9V100C20MP12C	100/65	96/62	14.7	96	35 - 65	35 - 65
TM9V120D20MP12C	120/78	115/75	14.7	96	35 - 65	35 - 65
Model	Maximum outlet air temperature	Blower		Blower wheel size	Recommended fuse or circuit breaker	Gas pipe connection, NPT
	°F	HP	A	in.	A	in.
TM9V040A10MP12C	190	1/2	7.7	11 x 8	15	1/2
TM9V060B12MP12C	190	1/2	7.7	11 x 8	15	1/2
TM9V080B12MP12C	190	1/2	7.7	11 x 8	15	1/2
TM9V080C16MP12C	190	3/4	9.6	11 x 10	15	1/2
TM9V100C16MP12C	190	3/4	9.6	11 x 10	15	1/2
TM9V100C20MP12C	190	1	12.8	11 x 11	20	1/2
TM9V120D20MP12C	190	1	12.8	11 x 11	20	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 is installed so that the electrical components are protected from water.

## Filter performance

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 (high velocity 600 FPM)

CFM	Cabinet size	Side (in.)	Bottom (in.)
1000	A	16 x 25	14 x 25
1200	B	16 x 25	16 x 25
1600	C	16 x 25	20 x 25
2000	C	(2) 16 x 25	20 x 25
2000	D	(2) 16 x 25	22 x 25

- Air velocity through throwaway type filters may not exceed 300 ft/min (91.4 m/min). All velocities over this require the use of high velocity filters.
- Do not exceed 1,800 CFM using a single side return and a 16x25 filter. For CFM greater than 1,800, 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 furnaces approved for alcove and attic installation.

Application	Upflow	Downflow (in.)	Horizontal (in.)
Top (in.)	1	0	0
Vent (in.)	0	0	0
Rear (in.)	0	0	0
Side (in.)	0	0	1
Front <sup>1</sup> (in.)	0	0	0
Floor	Combustible	Combustible <sup>2</sup>	Combustible
Closet	Yes	Yes	Yes
Line Contact	No	No	Yes

- 24 in. clearance in front and 18 in. on side for service access
- For combustible floors only when used with special sub-base

## Accessories

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

S1-1NP0347 - All models

**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

**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. Provide 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 a 1/2 in. plastic tube fittings for installation in the drain line. Calcium carbonate refill media is 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 that the pressure switch be changed. For altitudes above 5,000 ft, see kits below.

S1-1PS3308 - All models

**Thermostats** - Compatible thermostat controls are available through accessory sourcing. For optimum performance, these outdoor units are fully compatible with our Hx™ Touchscreen Thermostats available through Source1. For more information, see the thermostat section of the Product Equipment Catalog.

## Airflow data

High and low speed cooling and heat pump CFM									
040A10		060B12		080B12		080C16		Jumper settings	
HIGH COOL	LOW COOL	HIGH COOL	LOW COOL	HIGH COOL	LOW COOL	HIGH COOL	LOW COOL	COOL Tap	ADJ Tap
1033	749	1425	838	1228	834	1741	1049	A	B
941	666	1087	714	1058	739	1505	916	B	B
950	675	1200	771	1143	781	1446	946	A	A
877	611	996	658	952	686	1343	843	B	A
886	620	1075	703	1037	728	1402	858	A	C
785	538	861	579	845	611	1255	799	C	B
804	547	895	590	866	622	1167	769	B	C
685	483	669	454	686	505	1005	666	D	B
740	492	782	533	792	568	1108	710	C	A
630	428	613	421	632	473	916	593	D	A
666	437	714	477	739	526	990	637	C	C
565	428	556	421	579	473	828	534	D	C
		100C16		100C20		120D20		Jumper settings	
		HIGH COOL	LOW COOL	HIGH COOL	LOW COOL	HIGH COOL	LOW COOL	COOL Tap	ADJ Tap
		1757	1093	2105	1423	2176	1374	A	B
		1531	966	1724	1121	1733	1100	B	B
		1474	995	1945	1282	1986	1248	A	A
		1376	896	1583	1021	1585	1016	B	A
		1432	910	1744	1141	1775	1121	A	C
		1291	854	1543	961	1501	973	C	B
		1206	825	1423	880	1374	910	B	C
		1051	727	1302	800	1248	847	D	B
		1150	769	1423	840	1332	889	C	A
		966	656	1182	700	1163	784	D	A
		1037	698	1242	760	1206	805	C	C
		882	600	1081	599	1037	699	D	C

High/low heat CFM									
040A10		060B12		080B12		080C16		Jumper settings	
HIGH HEAT	LOW HEAT	HIGH HEAT	LOW HEAT	HIGH HEAT	LOW HEAT	HIGH HEAT	LOW HEAT	HEAT Jumper	ADJ Jumper
890	770	1200	870	1366	1156	1580	1156	A	any
790	660	1070	770	1293	1022	1422	1027	B	any
711	578	970	693	1185	924	1293	924	C	any
646	514	890	630	1094	840	1185	840	D	any
		100C16		100C20		120D20		Jumper settings	
		HIGH HEAT	LOW HEAT	HIGH HEAT	LOW HEAT	HIGH HEAT	LOW HEAT	HEAT Jumper	ADJ Jumper
		1975	1444	1975	1284	2250	1539	A	any
		1778	1284	1778	1156	2133	1385	B	any
		1616	1156	1616	1050	1939	1259	C	any
		1481	1050	1481	963	1778	1154	D	any

All CFMs are shown at 0.5 in. W.C. external static pressure. These units have variable speed motors that automatically adjust to provide constant CFM from 0 in. W.C. to 0.6 in. W.C. static pressure. From 0.6 in. to 1 in. static pressure, CFM is reduced by 2% per 0.1 in. increase in static.

Do not operate on duct systems with greater than 1 in. W.C. external static pressure.

**Note:** At some settings, LOW COOL or LOW HEAT airflow may be lower than what is required to operate an airflow switch on certain models of electronic air cleaners. Consult the instructions for the electronic air cleaner for further details.

\* Do not use the ADJ D tap.

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