



Coleman Technical Guide: Z9ES Series - Condensing Residential Gas Furnaces

Single-Stage Standard ECM Multi-Position



York International Corporation, 5005 York
Drive, Norman, OK 73069

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Description

These compact units employ induced combustion, reliable hot surface ignition, a high heat transfer aluminized steel tubular primary heat exchanger, and a corrosion resistant stainless steel secondary heat exchanger. The units are factory shipped for installation in upflow applications and can be converted for downflow or horizontal 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.

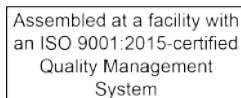
These units are Category IV, National Fuel Gas Code and can be vented either through side wall or roof applications using approved plastic combustion air and vent piping. Approved plastic combustion air and vent piping include PVC, CPVC, ABS, IPEX System 1738, Selkirk Polyflue, Duravent PolyPro, and Centrotherm InnoFlue polypropylene venting systems.

Due to continuous product improvement, specifications are subject to change without notice. **This document is only for distribution use - it is not to be used at point of retail sale.**

Visit us on the web at www.simplygettingthejobdone.com and www.colemanac.com.

Additional rating information can be found at www.ahridirectory.org.

Certification



Warranty

20-year limited warranty on the heat exchanger.

10-year heat exchanger warranty on non-residential applications.

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 the *Limited Warranty certificate* in the *Users Information Manual* for details.

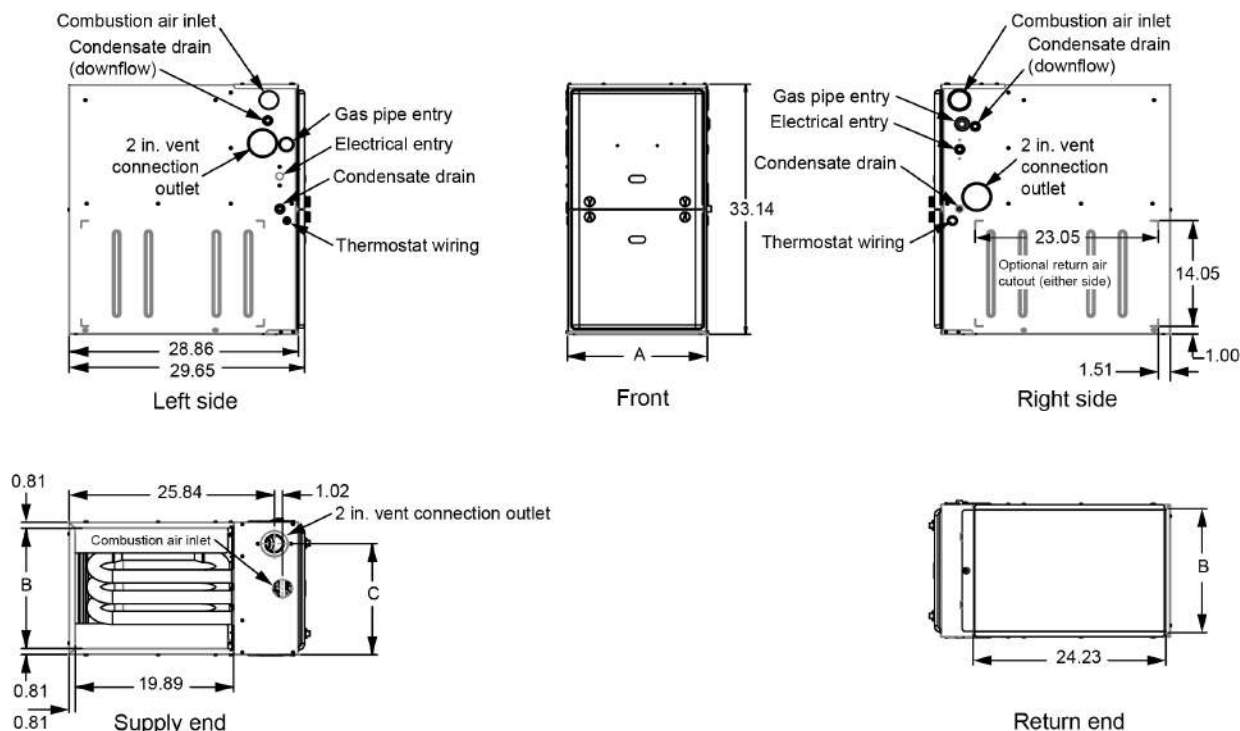
Features

- Easily applied in upflow, horizontal left or horizontal right, or downflow installation with minimal conversion necessary.

- Venting kit for downflow (counter-flow) applications on B, C, and D cabinets where side discharge is not possible.
- The unit cabinet is compact and easy to install with an ideal height of 33 in.
- Full length fold-up duct connector flanges for application flexibility.
- Easy access to controls to connect power and control wiring.
- No electrical knockouts to deal with, making installation easier.
- 24 V, 40 VA control transformer and control provisions supplied for single or multi-stage add on cooling.
- Built-in, high level self diagnostics with fault code displays standard on integrated control module for reliable operation.
- Front-facing screws on flame sensor and hot surface ignitor for ease of service.
- Front-facing screws on blower assembly for easy access and removal of blower.
- Constant torque blower motor for cooling SEER2 enhancement.
- Blower-off delay for cooling SEER2 improvement.
- Continuous fan options for indoor air quality (IAQ) performance.
- Airflow leakage less than 2% of nominal airflow for duct performance testing conditions.
- Low unit current requirement for easy replacement application.
- Electronic hot surface ignition saves fuel cost with increased dependability and reliability.
- 100% shut-off main gas valve for extra safety.
- Inducer rotates for easy conversion of venting options.
- The 26k model is not convertible for use with propane (LP) gas. All other models are field-convertible for use with propane (LP) gas with an optional propane accessory conversion kit.
- Five-speed direct drive standard ECM blower motor.
- Hi-tech tubular aluminized steel primary heat exchanger.
- Corrosion resistant stainless steel secondary heat exchanger including rear cover pan and front vestibule panel.
- Quiet inducer operation.
- Timed on, adjustable off blower capability for maximum comfort.
- Blower door safety switch below the blower deck.
- Solid removable bottom panel allows easy conversion for bottom return air applications.
- Twinning terminal for controlling two identical models installed with a common duct system. No external kit is required.
- External air filters are used for maximum flexibility in meeting customers' IAQ needs.
- 1/4 turn knobs are provided for easy independent door removal.
- Insulated blower compartment for thermal and acoustic performance.
- 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 (except 26k) using indoor combustion air.
- No special vent termination required.
- These condensing furnace models produce <40 ng/J NO_x emissions.
- Fold-up duct connector flanges for application flexibility.
- Patented self-priming internal condensate trap design for easy installation.

Dimensions

Figure 1: Dimensions



A1795-001

Table 1: Cabinet and duct dimensions

Model	Cabinet size	A		B		C		Approximate operating weight	
		in.	cm	in.	cm	in.	cm	lb	kg
Z9ES026A08SMPS1	A	14.5	36.8	13.4	34	11.7	29.7	103	47
Z9ES040A10SMPS1	A	14.5	36.8	13.4	34	11.7	29.7	106	48
Z9ES060A10SMPS1	A	14.5	36.8	13.4	34	11.7	29.7	109	49
Z9ES060B12SMPS1	B	17.5	44.4	16.4	41.6	14.7	37.4	112	51
Z9ES080B12SMPS1	B	17.5	44.4	16.4	41.6	14.7	37.4	117	53
Z9ES080C16SMPS1	C	21	53.3	19.8	50.5	18.2	46.2	127	58
Z9ES080C20SMPS1	C	21	53.3	19.8	50.5	18.2	46.2	135	61
Z9ES100C16SMPS1	C	21	53.3	19.8	50.5	18.2	46.2	131	59
Z9ES100C20SMPS1	C	21	53.3	19.8	50.5	18.2	46.2	138	63
Z9ES120D20SMPS1	D	24.5	62.2	23.4	59.4	21.7	55.1	147	67

Ratings and physical and electrical data

Table 2: Ratings and physical and electrical data

Model	Input	Output	AFUE	Air temperature rise	Maximum outlet air temperature	Blower		Blower size	Fuse or circuit breaker	Total unit	Gas pipe connection, NPT
	MBH	MBH	%	°F	°F	hp	A	in.	A	A	in.
Z9ES026A08	26	25	97.0	25 to 55	190	1/3	4.1	11 x 8	15	6.5	1/2
Z9ES040A10	40	38	96.0	30 to 60	190	1/2	6.4	11 x 8	15	8.8	1/2
Z9ES060A10	60	57	96.0	35 to 65	190	1/2	6.4	11 x 8	15	8.8	1/2
Z9ES060B12	60	57	96.0	30 to 60	190	1/2	6.4	11 x 8	15	8.8	1/2
Z9ES080B12	80	76	96.0	40 to 70	190	1/2	6.4	11 x 8	15	8.8	1/2
Z9ES080C16	80	76	96.0	40 to 70	190	3/4	8.4	11 x 10	20	10.8	1/2
Z9ES080C20	80	76	96.0	30 to 60	190	1	12.2	11 x 11	20	14.6	1/2
Z9ES100C16	100	95	96.0	40 to 70	190	3/4	8.4	11 x 10	20	10.8	1/2
Z9ES100C20	100	95	96.0	35 to 65	190	1	12.2	11 x 11	20	14.6	1/2
Z9ES120D20	120	114	96.0	45 to 75	190	1	12.2	11 x 11	20	14.6	1/2

- Note:**
- For optimal performance, external static pressures of 0.2 in. W.C. to 0.5 in. W.C. are recommended. Heating applications are tested at 0.5 in. W.C. external static pressure.
 - 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

CAUTION

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

The airflow capacity data shown in [Table 6](#) 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 the filter manufacturer's recommendation and a transition is used to allow use of a 20 x 25 filter.

Table 3: Recommended filter sizes

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

① **Note:**

- Air velocity through disposable type 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 may 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.

Table 4: Unit clearances to combustibles - all dimensions in inches and all surfaces identified with the unit in an upflow configuration

Application	Top in. (cm)	Vent in. (cm)	Rear in. (cm)	Side in. (cm)	Front in. (cm)	Floor	Closet	Line contact
Upflow	1 (2.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	Combustible	Yes	No
Downflow	1 (2.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	Combustible ¹	Yes	No
Horizontal	1 (2.5)	0 (0.0)	0 (0.0)	1 (2.5)	0 (0.0)	Combustible	Yes	Yes

¹ For combustion floors but only when used with special sub-base

① **Note:** Ensure a 24 in. clearance in front and 18 in. on side for service access. All furnaces are approved for alcove and attic installation.

Accessories

Propane (LP) conversion kit

This accessory conversion kit can be used to convert natural (NAT) gas units for propane (LP) operation, with the exception of the 26k model.

S1-1NP0347

Propane (LP) conversion kit with stainless steel burners

This accessory conversion kit can be used to convert natural (NAT) gas units for propane (LP) operation, with the exception of the 26k model. The kit includes stainless steel burners.

S1-1NP0820

Propane (LP) stainless steel burner kit

This accessory conversion kit can be used to convert existing burners to stainless steel burners for propane (LP) use only.

S1-32926889000 - all propane (LP) models

Natural (NAT) gas stainless steel burner kit

This accessory kit can be used to replace existing burners with stainless steel burners for natural (NAT) gas use only.

S1-32924441000 - all natural (NAT) gas models

Concentric vent termination

For use through rooftop, sidewall. 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 Source 1 Parts (P/N 026-30228-000).

S1-1NK0301

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

Side return filter racks

The S1-1SR0402 kit accommodates only a 1 in. filter.

S1-1SR0402 - all models

Combustible floor base kit

This kit is required to prevent potential overheating situations when the furnace is installed in a downflow application directly onto combustible flooring material. This kit is also required in any application 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 switch kit

A high altitude pressure switch kit is required for installation at altitudes above 5,000 ft. Use the correct kit for the furnace input rate and size.

Table 5: High-altitude pressure switch kits

Furnace input rate in kBtu/h and size	High-altitude pressure switch kit part number
26A08	S1-1PS3313
40A10	S1-1PS3315
60A10	S1-1PS3313
60B12	S1-1PS3313
80B12	S1-1PS3316
80C16	S1-1PS3314
80C20	S1-1PS3314
100C16	S1-1PS3317
100C20	S1-1PS3318
120D20	S1-1PS3314

Thermostats

Compatible thermostat controls are available through accessory sourcing. For optimum performance, these outdoor units are fully compatible with our residential Hx™ Touch Screen Thermostat available through Source 1. For more information, refer to the *Thermostat & Controllers* section at <http://www.simplygettingthejobdone.com>.

Downflow vent kit

This kit can be used when the furnace is in the downflow position and there is not enough room for venting through the side of the furnace cabinet.

S1-37348990001 internal vent kit 17.5 in.

S1-37348991001 internal vent kit 21.0 in.

S1-37348992001 internal vent kit 24.5 in.

Note: There is no kit available for A width cabinet models.

Blower performance

Table 6: Blower performance CFM - any position (without filter)

Model	Speed	Airflow (SCFM)							
		External static pressure (in. H ₂ O)							
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Z9ES026A08	High	950	900	875	850	800	775	750	725
	Medium high	875	850	825	775	750	725	675	650
	Medium	775	750	700	675	625	600	550	525
	Medium low	750	700	675	625	600	550	525	475
	Low	650	600	550	525	475	425	400	350
Z9ES040A10	High	1050	1025	1000	975	950	900	875	850
	Medium high	825	800	775	750	700	675	650	600
	Medium	775	750	700	675	625	600	550	525
	Medium low	725	675	650	600	550	525	475	450
	Low	575	525	475	425	375	325	275	225
Z9ES060A10	High	1100	1075	1050	1025	1000	950	925	900
	Medium high	1050	1000	975	950	925	875	850	825
	Medium	875	825	775	725	675	650	600	575
	Medium low	775	750	700	650	625	575	525	500
	Low	675	575	475	400	325	275	200	175
Z9ES060B12	High	1300	1275	1250	1225	1200	1175	1150	1100
	Medium high	1175	1150	1125	1100	1075	1050	1000	975
	Medium	1050	1025	1000	975	950	925	900	850
	Medium low	1000	975	950	900	875	850	800	775
	Low	900	850	800	750	700	675	625	600
Z9ES080B12	High	1400	1375	1350	1325	1300	1275	1250	1200
	Medium high	1250	1225	1200	1150	1125	1100	1075	1050
	Medium	1100	1075	1025	1000	975	950	900	875
	Medium low	975	950	900	875	825	800	750	725
	Low	775	725	675	625	600	550	500	450
Z9ES080C16	High	1750	1725	1700	1675	1625	1600	1550	1500
	Medium high	1575	1525	1500	1475	1450	1400	1375	1325
	Medium	1325	1275	1250	1200	1175	1125	1100	1050
	Medium low	1225	1175	1125	1075	1025	1000	950	900
	Low	1025	950	875	825	750	700	650	600
Z9ES080C20	High	1950	1925	1900	1850	1825	1775	1725	1675
	Medium high	1850	1800	1775	1750	1700	1675	1625	1575
	Medium	1550	1500	1475	1425	1375	1350	1300	1250
	Medium low	1325	1275	1250	1200	1150	1100	1050	1000
	Low	1200	1150	1075	1025	975	925	875	800
Z9ES100C16	High	1925	1900	1875	1825	1800	1750	1700	1650
	Medium high	1725	1700	1675	1625	1600	1575	1525	1500
	Medium	1600	1575	1550	1525	1500	1450	1425	1375
	Medium low	1325	1275	1225	1175	1125	1100	1050	1000
	Low	1225	1175	1125	1075	1025	975	925	875
Z9ES100C20	High	1975	1925	1900	1875	1825	1775	1725	1675
	Medium high	1800	1775	1750	1725	1675	1650	1600	1550
	Medium	1700	1675	1650	1625	1575	1550	1500	1450
	Medium low	1325	1275	1225	1175	1150	1100	1050	1000
	Low	1175	1125	1075	1025	975	925	875	825
Z9ES120D20	High	1950	1925	1900	1875	1825	1800	1750	1725
	Medium high	1825	1800	1750	1725	1700	1650	1625	1600
	Medium	1625	1575	1550	1500	1450	1425	1375	1350
	Medium low	1525	1475	1450	1400	1350	1325	1275	1250
	Low	1400	1350	1300	1275	1225	1175	1125	1075
Note: - The airflow is expressed in standard cubic feet per minute (SCFM). - The motor voltage is at 115 V. - Do not use shaded values as heating speeds.									

Third-party trademarks

Third-Party Trademarks Notice: For information about third-party trademarks, refer to the relevant company websites.

