

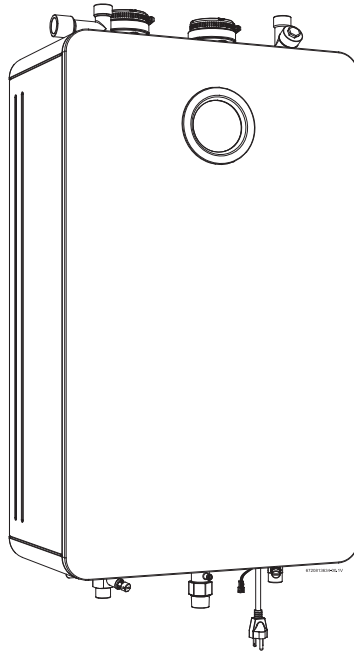
Bosch Greentherm T9900 SE 160/199 Gas Tankless Water Heater

Engineering
Submittal
Sheet



BOSCH

Product Overview & Certifications



Engineering Specifications

The system shall consist of ___ gas tankless water heater(s) model Greentherm T9900 SE 160/199 as manufactured by Bosch Thermotechnology.

Water Heater shall be CSA/ANSI Z21.10.3 listed, and capable to operate with natural gas and propane gas. The Greentherm T9900 SE 160 Water Heater shall have an input of 160,000 BTU/Hr with natural or propane fuel. The Greentherm T9900 SE 199 Water Heater shall have an input of 199,000 BTU/Hr with natural or propane fuel. Water Heater shall have Low NOx emissions and be 2016 SCAQMD NOx certified to rule 1146.2.

CONSTRUCTION

Water Heater shall be gas fired, condensing tankless design with a segmented power burner and modulating gas valve.

Primary heat exchanger/combustion chamber shall incorporate a multi pass copper tube and fin design. Secondary condensing heat exchanger shall incorporate a multi-pass stainless steel design. Heat exchangers shall be rated for maximum working pressure of 150 psig.

The Water Heater shall be equipped with an active bypass valve to achieve water temperature stability of less than +/- 2 °F under constant flow.

On the cold water inlet connection the Water Heater shall be equipped with an externally accessible in-line water filter.

The Water Heater shall allow three methods of control:

1. Using the front mounted control panel with a high resolution LCD display and touch keys.
2. Using a Bosch app available for iOS and Android when an optional wireless module is installed.
3. Using an external wired remote with a high resolution LCD display and touch keys.

These methods of control shall allow extensive self-diagnostic capabilities that incorporate a minimum of 38 separate fault codes.

The Water Heater shall come equipped with power cord and shall operate on 120V/1/60Hz electrical service.

Bosch Greentherm T9900 SE 160/199 Gas Tankless Water Heater



Engineering Specifications

INSTALLATION

All aspects of installation of Water Heater system shall be in strict accordance with manufacturer's instructions.

Materials shall conform to all manufacturer's recommendations including a manufacturer listed vent system. Equivalent vent length shall be up to 60' when using 2" pipe and 280' when using 3" pipe.

Water Heater will include a barometric pressure sensor that will be used to determine the altitude of installation and automatically implement combustion adjustments.

Water Heater will have top mounted water connections and bottom mounted flush ports.

Water Heater shall include an ASME approved temperature/pressure relief valve with a setting of 150 psig. Water Heater shall require a minimum gas pressure of 3.5" W.C. of natural gas and 8.0" W.C. for propane.

MODE OF OPERATION

The outlet water temperature shall be field adjustable between 100°F and 140°F.

Water Heater shall be capable of maintaining the outlet temperature within an accuracy of $\pm 2^\circ\text{F}$. This shall be accomplished by modulation of firing rate and the use of the active bypass valve.

The Water Heater shall be capable to allow domestic hot water recirculation with the use of an integrated pump, when the product is installed in accordance with manufacturer's instructions.

WARRANTY

The water heater shall carry a limited warranty subject to the manufacturer's warranty terms.

The warranty terms are available on Bosch website:

<https://www.bosch-climate.us/products-bosch-thermotechnology/gas-tankless-water-heaters/>

Performance Data

	Unit	T9900 SE 160	T9900 SE 199
Maximum flow rate at a 35 °F (19.4 °C) rise	GPM (l/min)	9.0 (34.0)	11.2 (42.4)
Maximum flow rate at a 45 °F (25 °C) rise	GPM (l/min)	7.0 (26.7)	8.7 (32.9)
Maximum flow rate at a 55 °F (30.6 °C) rise	GPM (l/min)	5.8 (21.9)	7.2 (27.5)
Maximum flow rate at a 75 °F (41.7 °C) rise	GPM (l/min)	4.2 (15.9)	5.2 (19.7)
Maximum flow rate at a 90 °F (50 °C) rise	GPM (l/min)	3.5 (13.2)	4.4 (16.6)
Maximum gas input ¹	BTU/hr (kW)	160 000 (46.64)	199,000 (58.3)
Minimum input ²	BTU/hr (kW)	9,000 (2.6)	9,000 (2.6)
Maximum output	BTU/hr (kW)	157 608 (46.2)	197,010 (57.7)
Thermal efficiency (Efficiency in %)	%	> 99%	> 99%

¹) Input rating is based on sea level operation and need not be changed for operation up to 2000 ft (610 m) elevation. For operation at elevations above 2000 ft (610 m), input rating is automatically reduced at the rate of 4 percent (US) or 10 percent (Canada) for each 1000 ft (305 m) above sea level.

²) When converted to LPG the minimum input is 17 000 BTU/hr (5 kW).

Bosch Greentherm T9900 SE 160/199 Gas Tankless Water Heater



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Operational Data			
	Unit	T9900 SE 160	T9900 SE 199
Temperature Control¹			
Selection range	°F (°C)	100 - 120 ² (38 - 49)	100 - 120 ² (38 - 49)
Default temperature	°F (°C)	120 (49)	120 (49)
Temperature stability ³	°F (°C)	± 2 (± 1)	± 2 (± 1)
Gas Requirement			
Gas connection	inches	¾	¾
Gas pressure range NG / LP	Inch W.C.	3.5" - 10.5" / 8" - 13"	3.5" - 10.5" / 8" - 13"
Water			
Top hot water connection NPT	inches	¾"	¾"
Top cold water connection NPT	inches	¾"	¾"
Minimum water flow ⁴	GPM (l/min)	0.45 (1.7)	0.45 (1.7)
Maximum water pressure	PSI (bar)	150 (10.3)	150 (10.3)
Minimum water pressure	PSI (bar)	18 (1.2)	18 (1.2)
Minimum well pressure	PSI	30 (2.1)	30 (2.1)
Water valve material	—	Polymer (PPS) (Polypropylene Sulfide)	Polymer (PPS) (Polypropylene Sulfide)
Combustion			
CO level	ppm	≤ 250 (measured)	≤ 250 (measured)
CO2 level (set from factory)	%	see installation manual	see installation manual
Weight			
Net weight	pounds (kg)	74.3 (33.7)	78.70 (35.7)
Gross weight	pounds (kg)	86.64 (39.3)	91.05 (41.3)
Electrical			
Voltage	V AC	120	120
Frequency	Hz	60	60
Amperage (Idle)	mA	40	40
Amperage (operation)	A	≤ 2.7	≤ 2.7
Water protection ⁵	IP	X4D	X4D
Venting			
Venting category	—	IV	IV
Approved vent or combustion air pipe material - United States	—	PP flexible/concentric/rigid PVC sched. 40, PVC-DWV, CPVC sched. 40, ABS-DWV sched. 40	PP flexible/concentric/rigid PVC sched. 40, PVC-DWV, CPVC sched. 40, ABS-DWV sched. 40
Approved vent or combustion air pipe material - Canada	—	CSA or ULC certified only (ULCS636)	CSA or ULC certified only (ULCS636)

¹) With constant flow.

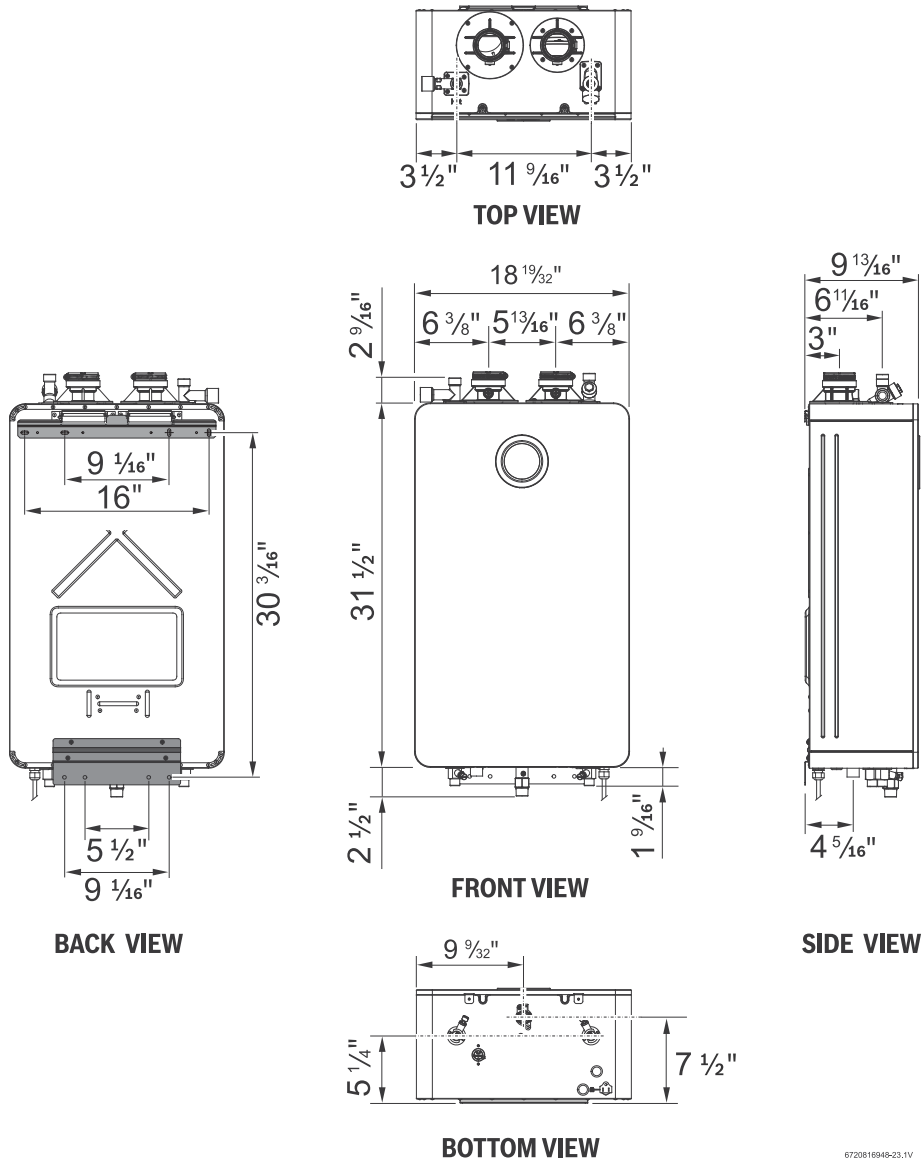
²) Can be reprogrammed to achieve 140 °F (60 °C).

³) Requirements: Steady flows, single unit installations, up to 140 °F (60 °C).

⁴) Refers to activation point. Deactivation point value is 0.35GPM (1.3 l/min).

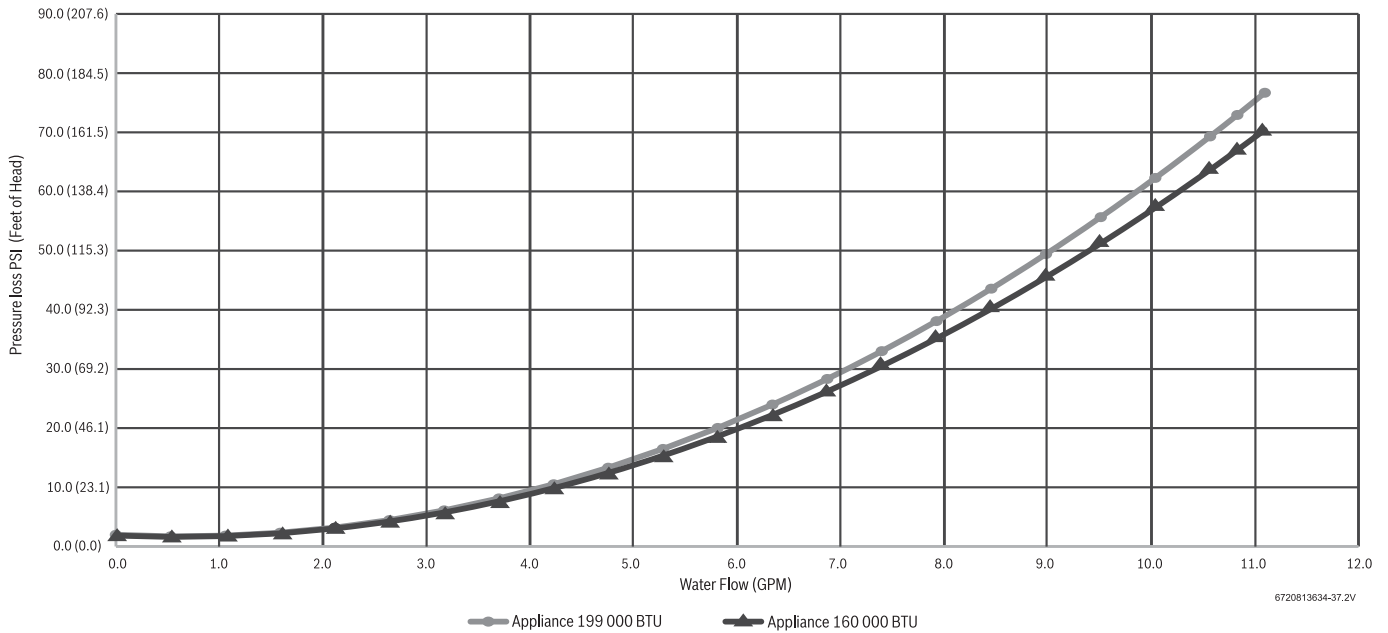
⁵) Protection against water splashing.

Dimensions and Connections

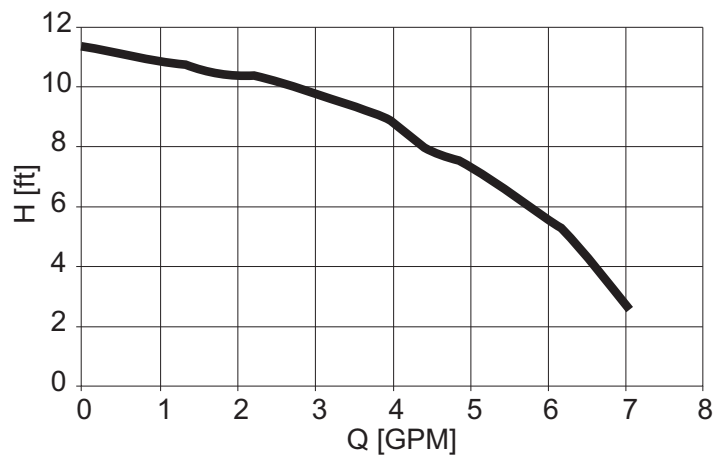


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Water Heater Pressure Drop Curve

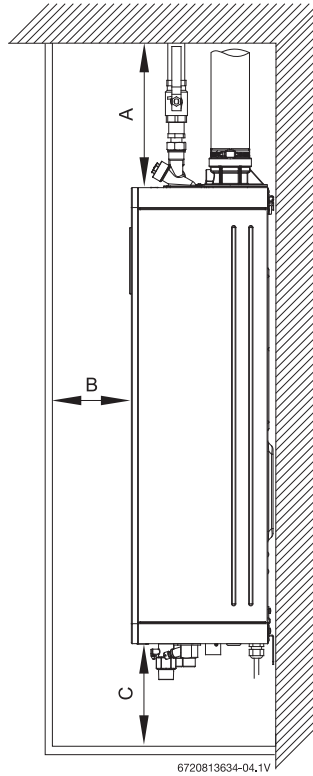


Recirculation Internal Pump Hydraulic Curve





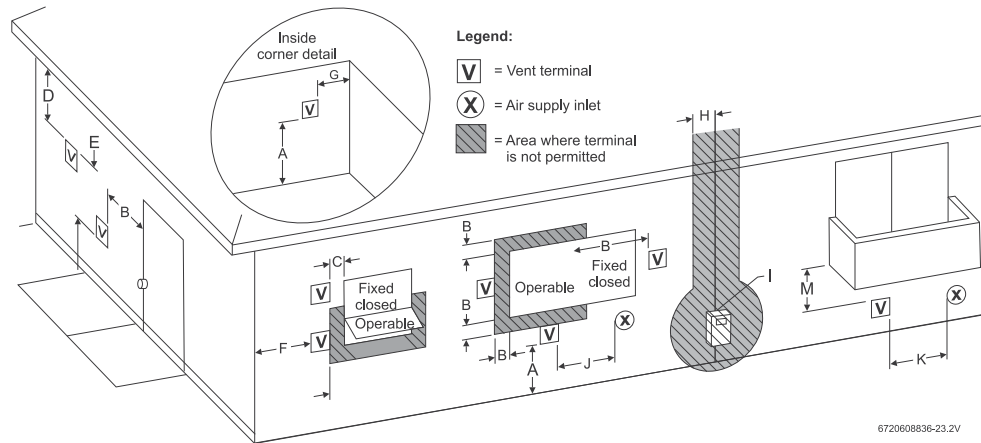
Clearances



* For servicing access, a 2ft clearance is recommended to the front cover.

Description	Unit	Recommended Minimum clearance*
TOP (A)	Inch	12
FRONT (B)	Inch	1
BACK	Inch	0
SIDES	Inch	1
FLOOR (C)	Inch	12

Required direct vent terminal clearances (twin pipe / concentric penetration)



Clearance Data

Item	Description	Canadian installations ¹⁾	U.S. installations ²⁾
A	Clearance above grade, veranda, porch, deck or balcony	12 in. (30cm)	12 in. (30cm)
B	Clearance to window or door that may be opened	36 in. (91cm)	12 in. (30cm) below or to side of opening; 12 in. (30cm) above opening.
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (61cm) from the center line of the terminal.	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	36 in. (91cm) within a height 15 ft (4.6m) above the meter/regulator assembly	*
I	Clearance to service regulator vent outlet	36 in. (91cm)	*
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance.	36 in. (91cm)	12 in. (30cm)
K	Clearance to a mechanical air supply inlet	6 feet (1.83m)	36 in. (91cm) above if within 10 ft (3m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13m) ³⁾	*
M	Clearance under veranda, porch deck or balcony	12 in. (30cm) ⁴⁾	*

1) In accordance with the current CSA B149.1 Natural Gas and Propane Installation Code

2) In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code

3) A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

4) Permitted only if veranda, porch, deck or balcony is fully open on a minimum of two sides beneath the floor.

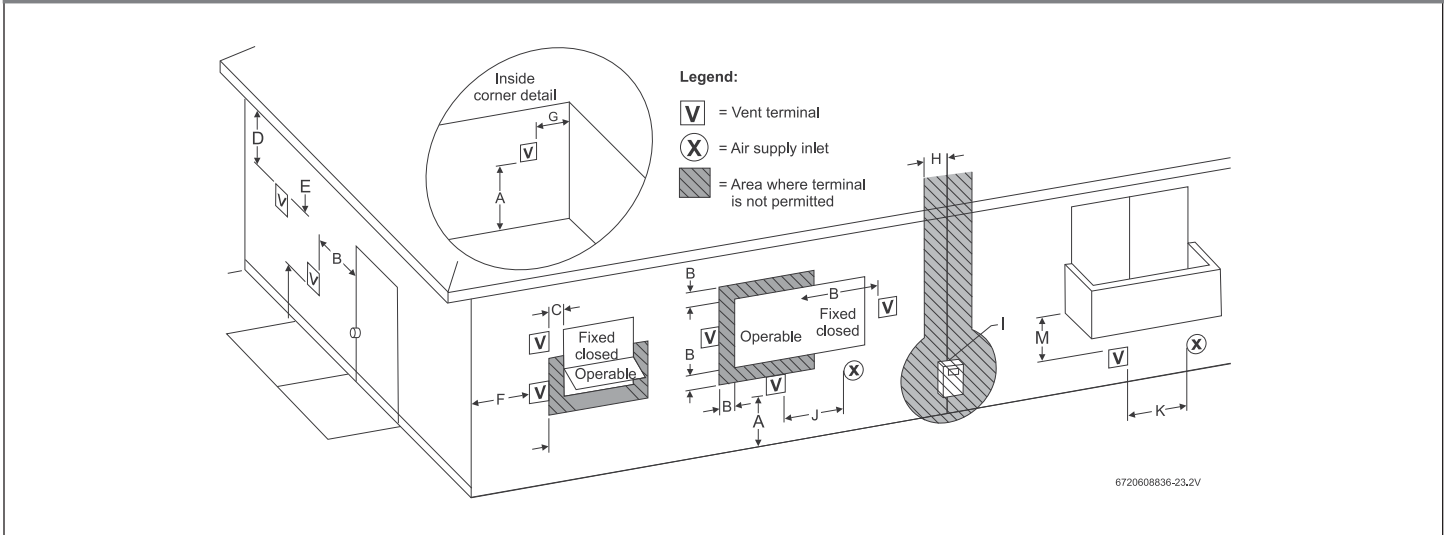
* For clearances not specified in ANSI Z223.1 / NFPA 54 or CSA-B149.1, one of the following shall be indicated:

a) A minimum clearance value determined by testing in accordance with section 2.20, or;

b) A reference to the following footnote:

"Clearance in accordance with local installation codes and the requirements of the gas supplier."

Required other than direct vent terminal clearances (single pipe penetration)

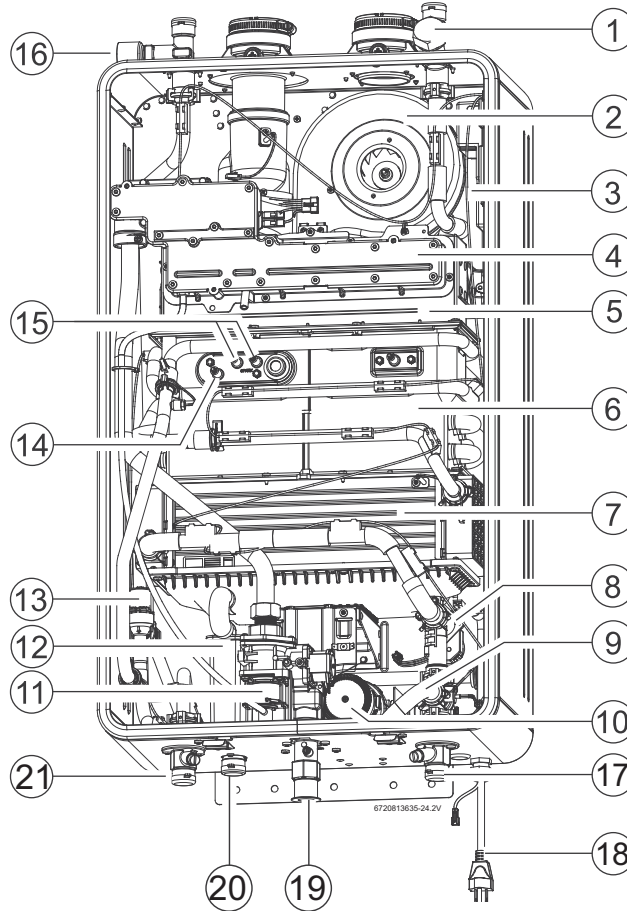


Clearance Data			
Item	Description	Canadian installations ¹⁾	U.S. installations ²⁾
A	Clearance above grade, veranda, porch, deck or balcony.	12 in. (30cm)	12 in. (30cm)
B	Clearance to window or door that may be opened.	36 in. (91cm)	48 in. (1.2 m) below or to side of opening; 12 in. (30cm) above opening)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	36 in. (91cm) within a height 15 ft (4.6m) above the meter/regulator assembly	*
I	Clearance to service regulator vent outlet	36 in. (91cm)	*
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	36 in. (91cm)	48 in. (1.2m) below or to side of opening; 1 ft (300mm) above opening
K	Clearance to mechanical air supply inlet	6 ft (1.83 m)	36 in. (91cm) above if within 10 ft (3m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13m) ³⁾	*
M	Clearance under veranda, porch deck or balcony	12 in (30cm) ⁴⁾	*

1) In accordance with the current CSA B149.1 Natural Gas and Propane Installation Code
 2) In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code
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 "Clearance in accordance with local installation codes and the requirements of the gas supplier."



Tankless Components



T9900 SE 160/199 Components

- | | |
|-------------------------|--------------------------|
| [1] Inlet water filter | [12] Condensate trap |
| [2] Air fan | [13] By-pass water valve |
| [3] Control unit | [14] Ionization sensor |
| [4] Gas manifold | [15] Ignition electrodes |
| [5] Burner | [16] PRV connection |
| [6] Heat exchanger | [17] HE drain |
| [7] Condensing unit | [18] Power cord |
| [8] Main water valve | [19] Gas connection |
| [9] By-pass pipe | [20] Condensate drain |
| [10] Recirculation pump | [21] HE drain |
| [11] Gas valve | |

DISCLAIMER

Specifications subject to change without notice. All dimensions shown on these engineering submittal sheets are for reference only and should not be used for field installation purposes. Please refer to current product installation manuals for detailed installation instructions and dimensions.