ML193DFE(K)
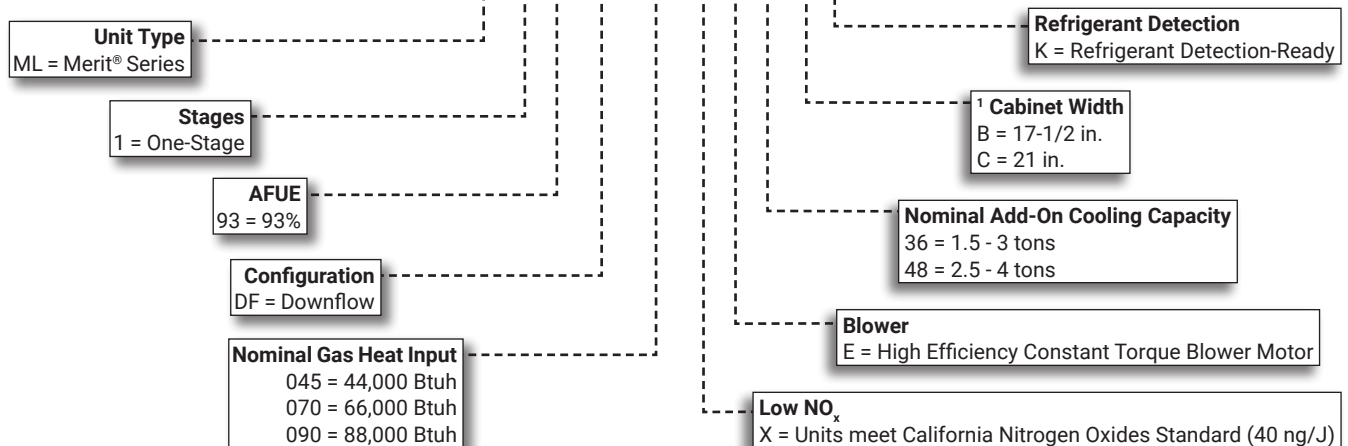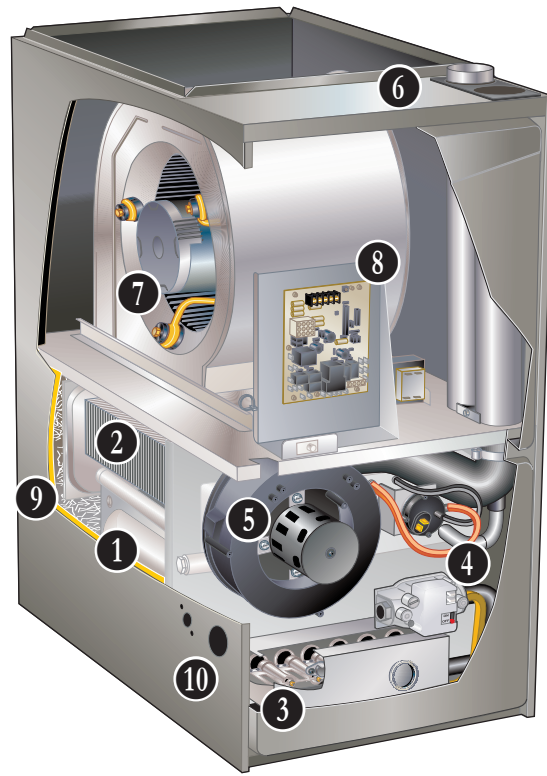
MERIT® SERIES

Downflow | High Efficiency Blower | Refrigerant Detection

RESIDENTIAL
PRODUCT SPECIFICATIONS (EHB)

AFUE - 93%
Input - 44,000 to 88,000 Btuh
Nominal Add-on Cooling - 1.5 to 4 Tons

MERIT® SERIES

QUALIFIED ONLY IN
U.S. SOUTH: AL, AZ, AR, CA, DC, DE, FL, GA, HI, KY, LA, MD, MS, NV, NM, NC, OK, SC, TN, TX, VA

QUALIFIED

ENERGY STAR

MODEL NUMBER IDENTIFICATION

ML 1 93 DF 070 X E 36 B K

Unit Type
ML = Merit® Series

Stages
1 = One-Stage

AFUE
93 = 93%

Configuration
DF = Downflow

Nominal Gas Heat Input
045 = 44,000 Btuh
070 = 66,000 Btuh
090 = 88,000 Btuh

Refrigerant Detection
K = Refrigerant Detection-Ready

¹ Cabinet Width
B = 17-1/2 in.
C = 21 in.

Nominal Add-On Cooling Capacity
36 = 1.5 - 3 tons
48 = 2.5 - 4 tons

Blower
E = High Efficiency Constant Torque Blower Motor

Low NO$_x$
X = Units meet California Nitrogen Oxides Standard (40 ng/J)

¹ Downflow indoor coils with the same letter designation will physically match the furnace **supply air opening**.

FEATURE HIGHLIGHTS

1. Lennox Duralok Plus™ Heat Exchanger
2. Secondary Heat Exchanger
3. Inshot Burners
4. Gas Control Valve
5. Combustion Air Inducer
6. SureLight® Integrated Furnace Control
7. Power Saver™ Constant Torque Blower
8. Insulated Cabinet
9. Safety Interlock Switch
10. Gas Piping And Electrical Inlets

CONTENTS

APPROVALS AND WARRANTY

APPROVALS

- AHRI Certified
- Tested and rated according to US DOE test procedures and FTC labeling regulations
- ENERGY STAR® units are certified only in the U.S. South in certain states and are designed to use less energy, help save money on utility bills, and help protect the environment
- ISO 9001 Registered Manufacturing Quality System
- Blower data from unit tests conducted in Lennox Laboratory air test chamber
- All models meet UL 60335-2-40 Refrigerant Detector Requirements

NOTE - This furnace has not been CSA International design certified for installation in mobile homes, recreational vehicles, or outdoors.

California Only

- These furnaces **do not meet** the South Coast Air Quality Management District (SCAQMD) Rule 1111 and San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4905 NOx emission limit (14 ng/J) and cannot be installed within the SCAQMD, SJVAPCD and Bay Area
- These furnaces are approved by the California Energy Commission and meets California Nitrogen Oxides Standard (NOx) limits of 40 ng/J

WARRANTY

- Duralok Plus™ Aluminized Steel Heat Exchanger:
  - Limited twenty year in residential applications
  - Limited ten years in non-residential applications
- All other covered components:
  - Limited five years in residential installations
  - Limited one year in non-residential installations

NOTE - Refer to Lennox® Basic Limited Warranty at www.Lennox.com for additional details.

FEATURES

APPLICATIONS

- Input capacities of 44,000, 66,000 and 88,000 Btuh.
- Energy efficiency (AFUE) 93%.
- Lennox add-on indoor coils, high-efficiency air cleaners and humidifiers can easily be added to furnace.
- Shipped factory assembled with controls installed and wired.
- Each unit factory test operated to ensure proper operation.

HEATING SYSTEM

1 Lennox Duralok Plus™ Heat Exchanger Assembly
- Lennox developed heat exchanger assembly consists of primary heat exchanger and secondary condenser coil assembly.
- Main multi-pass crimped seam design clamshell type heat exchanger.
- Constructed of heavy-gauge, aluminized steel.
- Designed for normal expansion and contraction with maximum efficiency and minimum resistance to air flow.

2 Secondary heat exchanger condenser coil constructed of aluminum fins fitted to stainless steel tubes.
- Coil is factory tested for leaks.

- Condensate drain header box assembly located on front of coil.
- Compact size of complete heat exchanger assembly permits low overall design of furnace cabinet.
- Heat exchanger assembly has been laboratory life cycle tested in excess of industry standards.

Lennox Designed Header Box
- Header box on end of condenser coil collects flue condensate for disposal through condensate drains.
- The drains are located on each side of the cabinet for easy field installation of condensate drain trap.
- Only one drain is used, the other drain is sealed.
- Condensate drain trap is included with unit for field installation.

FEATURES

HEATING SYSTEM (continued)

Lennox Designed Flue Condensate Trap Assembly
- Field installed outside the conditioned air stream
- Assembly can be mounted on either side of cabinet in upflow applications
- Assembly is mounted below the cabinet in horizontal applications
- Can also be mounted remotely (up to 5 ft. away) from unit
- See Dimension Drawing and Installation Instructions
- 90° street elbow furnished for ease of drain trap installation
- Drain connection can be made with field provided PVC pipe or PVC coupling
- Drain cap on trap allows easy cleaning and winterizing

❸ Inshot Burners
- Aluminized steel inshot burners provide efficient, trouble-free operation
- Burner venturi mixes air and gas in correct proportion for proper combustion
- Burner assembly can be removed from the unit as a single component for ease of service

SureLight® Hot Surface Ignitor
- Tough, reliable, long-life, trouble-free performance
- Silicon nitride ignitor
- Cemented to steatite block for protection against current leakage
- Ignition leads are constructed of nickel plated copper and are enclosed in high temperature Teflon® insulation for dependable operation

❹ Gas Control Valve
- 24 volt redundant combination gas control valve combines manual shut off switch (On-Off), automatic electric valve (dual) and gas pressure regulation into a compact combination control

Flame Rollout Switches (2)
- Factory installed on the front of the burner box
- Switch provides protection from abnormal operating conditions
- Manual reset

Limit Control
- Automatic reset, primary limit is accurately located on header box on all units

❺ Combustion Air Inducer
- Shaded pole heavy duty blower prepurges heat exchanger and safely vents flue products
- Operates only during heating cycle

Pressure Switch
- Proves Combustion Air Inducer operation before allowing gas valve to open

Optional Accessories

High Altitude Orifice Kits
- Required on all units for proper operation at altitudes from 7501 to 10,000 ft.
- Kits are available for natural gas and LPG/propane

High Altitude Pressure Switch Kit
- Required for proper unit operation on installations above 4500 ft.

Natural Gas to LPG/Propane Conversion Kit
- Required for field changeover from natural gas to LPG/Propane

LPG/Propane to Natural Gas Conversion Kit
- Required for field changeover from LPG/Propane to natural gas

Muffler (US Only)
- Significantly reduces outdoor operating sound levels
- Two-inch diameter muffler is optional for all models
- Installed vertically in the exhaust piping
- See Optional Accessory Dimension Drawing

DIRECT VENT / NON-DIRECT VENT SEALED COMBUSTION SYSTEM

- Furnace features a "sealed combustion" system and can be installed in either Direct Vent or Non-Direct applications
- In Direct Vent applications, combustion air is supplied from outdoors and flue gases are discharged outdoors
- In Non-Direct Vent applications, combustion air is supplied from indoors and flue gases are discharged outdoors
- **NOTE** - Lennox has approved the use of DuraVent® PolyPro® and Centrotherm InnoFlue® manufactured vent pipe and terminations as an alternative to PVC vent pipe. Must be ordered separately.
  Tested and listed to the ULC S636 standard in Canada.
- The polypropylene venting system must follow the uninsulated and unconditioned space vent lengths listed in the table on Page 12
- Refer to the Installation Instructions for additional details

FEATURES

DIRECT VENT / NON-DIRECT VENT SEALED COMBUSTION SYSTEM (continued)

Flue Coupling
- Assists with exhaust flue piping connection and servicing
- Includes flexible one 2-inch rubber coupling and two adjustable bands
- Approved for all Lennox 90% furnaces

Vent Termination Kits
- Facilitates installation of combustion air intake pipe and flue exhaust pipe
- Refer to venting table in this bulletin to determine pipe size needed and proper termination kit required
- See Optional Accessories table and dimension drawings

Concentric Termination Kit - Direct Vent Applications
- 2 or 3 inch kit contains concentric termination assembly, reducer bushing and 45° elbow
- 2 inch kit for -030-045-070 models contains an outdoor exhaust accelerator
- Kit requires single hole penetration of roof or wall for installation
- Roof Termination Flashing Kit is available for use with 2 inch Kits
- CSA certified

Flush-Mount Termination Kit
- Kit contains flush-mount termination, accelerator, mounting template and hardware
- Kit may be used with 2, 2-1/2 or 3 in. pipe

Wall Assembly Termination Kits

Close Couple (US Only) - Direct Vent Applications
- 2 or 3 inch kit consists of close-couple, side-by-side PVC piping with galvanized steel wall cover plate
- Seals and isolates intake and exhaust piping penetration of wall
- Piping spacing and length is sized for proper wall installations
- CSA certified

Close Couple WTK (Canada Only) - Direct Vent Applications
- 2 or 3 inch kit contains one insulated faceplate, one insulated exhaust pipe, elbow and fittings

NOTE - Maintain a maximum of 6 inches between the inlet and outlet openings in the installation of the pipes.

Roof Termination Flashing Kit
- For vertical venting through a roof
- 2 or 3 inch kit contains two neoprene rubber roof flashings
- Vent pipe and insulation not furnished
- Flashing Kit can also be used with Concentric Vent Termination Kits used in vertical venting rooftop applications

CONTROLS

6 SureLight® Integrated Furnace Control
- Contains all necessary controls and relays to operate furnace
- Combustion air inducer is operated by the integrated furnace control. Prior to ignition, a pre-purge cycle for 15 seconds is initiated
- After the main burners are turned off, a post-purge cycle for 5 seconds is run
- Flame sensor assures safe and reliable operation
- Should loss of flame occur, the integrated furnace control will initiate 4 re-attempts at ignition before locking out unit operation for 60 minutes
- Watchguard type circuit automatically resets ignition controls after one hour of continuous thermostat demand after unit lockout, eliminating nuisance calls for service
- Display LED - Seven segment LED displays numeric information related to diagnostics as well as system operation and status
  - Diagnostic codes are held in non-volatile memory, immune from power interruptions
  - Holds up to ten diagnostic codes in order of occurrence for recall on demand
  - Port on blower door allows for easy viewing
- Fan control consists of adjustable blower timed-off delay (60, 90, 120, 180 seconds - factory setting 120 seconds) and fixed blower timed-on delay (30 seconds heating, 2 seconds cooling)
- For air-conditioning applications, blower is automatically energized on thermostat demand for cooling
- Two accessory terminals furnished for additional power supply requirements for 120 volt (less than 1 amp) power humidifiers and powered air cleaners
- One additional terminal is furnished for power supply requirements for 24V (less than 0.5 amp) low voltage accessories
- Ignition control has a single red LED to indicate status

Twinning
- Terminal furnished on furnace control for twinning two furnaces together

24 Volt Transformer (40VA)
- Furnished and factory installed on outside of control box
- Circuit breaker (furnished) is wired in series

Field Wiring Make-Up Box
- Furnished for line voltage wiring
- Factory installed internally on left side of furnace
- Box may be installed internally on right side of furnace

CONTROLS (Continued)

Refrigeration Detection System (RDS)(Part of the SureLight® Integrated Furnace Control)

- Complies with UL 60335-2-40 approved standard
- Required for all systems using R-454B refrigerant
- Plug-in connection to the RDS Coil Sensor
- Supports up to two RDS Coil Sensors (factory setting)
- Used as an interface between indoor unit and thermostat to control system
- Ensures safe operation for systems equipped with R-454B refrigerant
- If R-454B refrigerant is detected, the refrigerant detection system will stop compressor and/or heating operation and operate the blower to reduce concentrations in the conditioned space
- Once safe levels are reached the HVAC system will resume normal operation
- Low GWP test button for troubleshooting
- Alarm/Zone relay interface can trigger an external alarm if R-454B refrigerant is detected and open all zone dampers (if part of a zoning system) if R-454B refrigerant is detected
- Power is disabled to non-communicating thermostats to prevent demand if R-454B refrigerant is detected
- On system start-up blower will run for five minutes and any thermostat demands are disabled

Optional Accessories

M30 Smart Wi-Fi Thermostat

- Wi-Fi-enabled, electronic 7-day, universal, multi-stage, programmable, touchscreen thermostat
- 4 Heat/2 Cool
- Auto-changeover
- Dual-fuel control with optional outdoor sensor
- Controls dehumidification during cooling mode and humidification during heating mode
- Offers enhanced capabilities including humidification / dehumidification / dewpoint measurement and control, Humiditrol® control, and equipment maintenance reminders
- Easy to read 4.3 in. color touchscreen (measured diagonally)
- LCD display with backlight shows the current and set temperature, time, inside relative humidity, system status (operating mode and schedules) and outside temperature (optional outdoor sensor required)
- Smooth Setback Recovery starts system early to achieve setpoint at start of program period
- Compressor short-cycle protection (5 minutes)
- Up to four separate schedules are available plus Schedule IQ™
- One-Touch Away Mode - A quick and easy way to set the cooling and heating setpoints while away
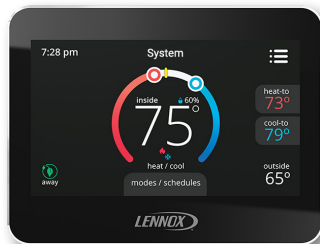
- Smart Away™ - Uses geo-fencing technology to determine when the homeowner is within a predetermined distance from the home to operate the system when leaving, away and arriving
- Wi-Fi remote monitoring and adjustment through a home wireless network for desktop PCs, laptops and apps for smartphones or tablets
- Smart home automation compatible with Amazon Alexa® and Google Assistant
- Service Dashboard features online real-time monitoring of installed Lennox® smart thermostats

NOTE - See the M30 Smart Wi-Fi Thermostat Product Specifications bulletin in the Controls section for more information.

Remote Outdoor Temperature Sensor

- Used with the M30 Smart Thermostat
- Outdoor sensor allows thermostat to display outdoor temperature

NOTE - Sensor is required for the Enhanced Dehumidification Accessory (EDA).

Thermostat

- Thermostat is not furnished with unit
- See Lennox Price Book for selection

Blower Relay Kit
(For Use With Two-Stage Outdoor Units)

- Allows furnace blower speed changes when matched with two-stage air conditioners or heat pumps

Transformer (75VA)

- Recommended when furnace is used with zoning or dual-fuel systems and other 24V accessories requiring a higher VA rating
- Circuit breaker (furnished) is wired in series
- Replaces the standard 40VA transformer

BLOWER

- Direct drive blower
- Statically and dynamically balanced
- Resiliently mounted
- Blower assembly easily removed for servicing

7 Power Saver™ Constant Torque Blower Motor
- DC Brushless Motor
- High Efficiency Constant Torque
- ECM (Electronically Commutated Motor)
- Motor is programmed to provide constant torque at each of the selectable speeds
- Motor is controlled by the Integrated Furnace Control
- Blower speeds are easily changed on the integrated furnace control
- See Blower Data tables

FEATURES

CABINET

- Low-profile, narrow width allows easy installation
- Heavy-gauge, cold rolled steel construction
- Pre-painted cabinet finish
- Flanges provided on supply air opening for ease of plenum connection or alignment with indoor coil
(8) • Insulated with foil faced insulation on sides and back of heating compartment
- Sealed blower compartment
- Complete service access
(9) • Safety interlock switch automatically shuts off power to unit when blower compartment access door is remove
(10) • Gas piping and electrical inlets are provided in both sides of cabinet

Coil Match-Up
- All Lennox downflow indoor coils will physically match the furnace supply air opening with the same letter designation (A, B, C, D) as in the furnace model number

Low Leakage Cabinet
- All models have less than 2% air leakage and meet ANSI/ASHRAE Standard 193-2010 "Method of Test for Determining the Air Tightness of HVAC Equipment"

Optional Accessories

Condensate Drain Heat Cable Kits
- Self-limiting wattage heat cable prevents condensate drain from freezing in unconditioned areas
- Available in 6 or 24 ft. lengths

Crawl Space Vent Drain Kit
- Allows venting through a crawl space for downflow applications
- Includes 2 or 3 in. sanitary tee, 2 in. PVC assembly, PVC boot and clamp
- Kit for Canada is certified to ULC S636

Downflow Combustible Flooring Base
- Required for heating only units installed on combustible floors
- Not required in add-on cooling applications
- See Dimension Drawing

FILTER (not furnished)

- Filter and provisions for external mounting must be field provided

Optional Accessories

Downflow Filter Cabinet
- Filter cabinet mounts directly on top of furnace
- "B and "C" width cabinets have two filters
- Filter rails are furnished
- Front access for servicing
- Cleanable filter(s) are furnished

INDOOR AIR QUALITY PRODUCTS

Healthy Climate® PureAir® Air Purification System

- Filtration - The Carbon Clean 16® (MERV 16) media filter captures more than 95% of particles 0.3 microns and larger and more than 90% of particles 0.01 microns and larger

- Highest airflow performance and lowest pressure drop when compared to a leading brand.

- Long life filters up to 1 year

Healthy Climate® Media Air Cleaner

- High performance in a narrow 7 in. cabinet

- Available with MERV 11, 13, or 16 rated filters

- Multi-position heavy gauge steel cabinet will support furnace/coil or air handler and associated duct work

- Tool-less entry

- Tool-less assembly for quick installation

Healthy Climate® Whole Home In Duct Air Purifiers

- Compact Duct Mounted Design

- Effective against odors and VOC's

- Certified Ozone free

- UVC lamp and carbon cells

Healthy Climate® Ultraviolet Germicidal Lights

- Compact duct mounted design

- Single or dual applications

- Certified ozone free

- Effective against odors to help keep the system clean

- Safety Interlocks
  (Additional UVC Compliance Kit for UL 60335-2-40 is available for A2L applications)

- Low power consumption

- Available for 24V or 110/230V

- Up to 1340 microwatts /cm² output (dual lamp model)

NOTE - Please refer to the individual Product Specifications for these products for full information.

NOTE - Please refer to the individual Product Specifications for these products for full information.

INDOOR AIR QUALITY PRODUCTS - ORDERING

NOTE - Refer to the individual Product Specifications documents for additional accessories and maintenance items.

Description	Dimensions	Order Number
Healthy Climate® PureAir® Air Purification System		
PCO3-14-16	21.125 x 8.75 x 23.75	**Y6601**
PCO3-16-16	17.5 x 8.75 x 26.5	**Y6598**
PCO3-20-16	21.125 x 8.75 x 26.5	**Y6595**
Healthy Climate® Media Air Cleaner		
HCC14-23 (Cabinet)	21.25 x 23 x 7	**X7930**
HCF14-16 (Filter) MERV 16	20 x 20 x 5	**X7935**
HCXF14-16 (Expandable Filter) MERV 16	20 x 20 x 5	**X8308**
HCF14-13 MERV 13	20 x 20 x 5	**19L14**
HCF14-11 (Filter) MERV 11	20 x 20 x 5	**X0585**
HCXF14-11 (Expandable Filter) MERV 11	20 x 20 x 5	**X8305**
HCC16-28 (Cabinet)	17.5 x 28.5 x 7	**Y2920**
HCC16-28 (Cabinet) 4-pack	17.5 x 28.5 x 7	**Y2921**
HCF16-16 (Filter) MERV 16	16 x 25 x 5	**X6672**
HCXF16-16 (Expandable Filter) MERV 16	16 x 25 x 5	**X8306**
HCF16-13 MERV 13	16 x 25 x 5	**19L16**
HCF16-11 (Filter) MERV 11	16 x 25 x 5	**X6670**
HCXF16-11 (Expandable Filter) MERV 11	16 x 25 x 5	**X8303**
HCC20-28 (Cabinet)	21 x 28.5 x 7	**X6661**
HCC20-28 (Cabinet) 4-pack	21 x 28.5 x 7	**X7751**
HCF20-16 (Filter) MERV 16	20 x 25 x 5	**X6675**
HCXF20-16 (Expandable Filter) MERV 16	20 x 25 x 5	**X8307**
HCF20-13 MERV 13	20 x 25 x 5	**19L17**
HCF20-11 (Filter) MERV 11	20 x 25 x 5	**X6673**
HCXF20-11 (Expandable Filter) MERV 11	20 x 25 x 5	**X8304**
Healthy Climate® Whole Home In Duct Air Purifiers		
HCWHAP1	8 x 7 x 16.5	**23V99**
Healthy Climate® Ultraviolet Germicidal Lights		
UVC-24V (24V) 17.5 in.	Ballast 4.75 x 2.25 x 2	**X9423**
UVC-41W-S (110/230V) 17.5 in.	Ballast 11.75 x 2.75 x 1.625	**X9424**
UVC-41W-D (110/230V) 17.5 in.	Ballast 11.75 x 2.75 x 1.625	**X9425**

SPECIFICATIONS

Gas Heating Performance	Model	ML193DF045XE36BK	ML193DF070XE36BK	ML193DF090XE48CK
	AHRI Reference No.	20556884	20556885	20556886
	[1] AFUE	93%	93%	93%
	Input - Btuh	44,000	66,000	88,000
	Output - Btuh	43,000	63,000	84,000
	Temperature rise range - °F	30 - 60	40 - 70	45 - 75
	Gas Manifold Pressure (in. w.g.) Nat. Gas / LPG/Propane	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0
	High static - in. w. g.	0.50	0.50	0.50
Connections	Intake / Exhaust Pipe (PVC)	2 / 2	2 / 2	2 / 2
	Gas pipe size IPS	1/2	1/2	1/2
	Condensate Drain Trap (PVC pipe) - i.d.	3/4	3/4	3/4
	with furnished 90° street elbow	3/4 slip x 3/4 MIPT	3/4 slip x 3/4 MIPT	3/4 slip x 3/4 MIPT
	with field supplied (PVC coupling) - o.d.	3/4 slip x 3/4 MPT	3/4 slip x 3/4 MPT	3/4 slip x 3/4 MPT
Indoor Blower	Wheel diameter x width - in.	10 x 8	10 x 8	10 x 10
	Motor output - hp	1/2	1/2	3/4
	Tons of add-on cooling	1.5 - 3	1.5 - 3	2.5 - 4
	Air Volume Range - cfm	335 - 1430	340 - 1415	825 - 1720
Electrical Data	Voltage	120 volts - 60 hertz - 1 phase		
	Blower motor full load amps	6.8	6.8	8.4
	Maximum overcurrent protection	15	15	15
Shipping Data	lbs. - 1 package	122	128	151

NOTE - Filters and provisions for mounting are not furnished and must be field provided.

[1] Annual Fuel Utilization Efficiency based on DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces.

INSTALLATION CLEARANCES

Sides	[1] 0 inches (0 mm)
Rear	0 inches (0 mm)
Top/Plenum	1 inch (25 mm)
Front	0 inches (0 mm)
Front (service/alcove)	24 inches (610 mm)
Floor	[2] Combustible

NOTE - Air for combustion must conform to the methods outlined in the National Fuel Gas Code (NFPA 54/ANSI-Z223.1) or the National Standard of Canada CAN/CSA-B149.1 "Natural Gas and Propane Installation Code".

NOTE - In the U.S. flue sizing must conform to the methods outlined in the current National Fuel Gas Code (NFPA 54/ANSI-Z223.1) or applicable provisions of local building codes. In Canada flue sizing must conform to the methods outlined in National Standard of Canada CAN/CSA-B149.1.

[1] Allow proper clearances to accommodate condensate trap and vent pipe installation.

[2] Clearance for installation on combustible floor if Optional Downflow Combustible Flooring Base is installed between furnace and combustible floor. Not required in add-on cooling applications if installed in accordance with local codes or National Fuel Gas Code ANSI-Z223.1 or CAN/CGA−149.1,.2. Do not install the furnace directly on carpeting, tile, or other combustible materials other than wood flooring.

OPTIONAL ACCESSORIES

		"B" Width Models	"C" Width Models
CABINET ACCESSORIES			
Downflow Combustible Flooring Base		**11M60**	**11M61**
CONDENSATE DRAIN KITS			
Condensate Drain Heat Cable	6 ft.	**26K68**	**26K68**
	24 ft.	**26K69**	**26K69**
Crawl Space Vent Drain Kit	US	**51W18**	**51W18**
	Canada	**15Z70**	**15Z70**
CONTROLS			
M30 Smart Wi-Fi Thermostat		**15Z69**	**15Z69**
Remote Outdoor Temperature Sensor		**X2658**	**X2658**
Blower Relay Kit (for two-stage outdoor units)		**85W66**	**85W66**
Transformer (75VA)		**27J32**	**27J32**
DOWNFLOW FILTER KITS			
[1] Downflow Filter Cabinet		**51W07**	**51W08**
	No. and Size of filter - in.	(2) 16 x 20 x 1	(2) 16 x 20 x 1
TERMINATION KITS			

See Installation Instructions for specific venting information.

			"B" Width Models	"C" Width Models
Direct Vent	Concentric	US - 2 in.	**71M80**	**69M29**
		3 in.	- - -	**60L46**
		Canada - 2 in.	**44W92**	**44W92**
		3 in.	- - -	**44W93**
	Flush-Mount	US - 2, 2-1/2 or 3 in.	**51W11**	**51W11**
		Canada - 2, 2-1/2 or 3 in.	**51W12**	**51W12**
	Wall - Close Couple	US - 2 in.	**22G44**	- - -
		3 in.	**44J40**	**44J40**
	Wall - Close Couple WTK	Canada - 2 in.	**30G28**	- - -
		3 in.	**81J20**	**81J20**
	Roof Termination Flashing Kit (no vent pipe - 2 flashings)	2 in.	**15F75**	**15F75**
		3 in.	**44J41**	**44J41**
VENTING				
Flue Coupling		2 in.	**17H92**	**17H92**

[1] Cleanable polyurethane frame type filter.

NOTE - Termination Kits (**44W92**, **44W93**, **30G28**, **51W12**, **81J20**) and Crawl Space Vent Drain Kit (**15Z70**) are certified to ULC S636 standard for use in Canada only.

GAS HEAT ACCESSORIES

Models	High Altitude Pressure Switch Kit		Natural Gas to LPG/Propane Kit	LPG/Propane to Natural Gas Kit	Natural Gas High Altitude Orifice Kit	LPG/Propane High Altitude Orifice Kit	Muffler (US Only)
	4501 - 7500 ft.	7501 - 10,000 ft.	0 - 7500 ft.	0 - 7500 ft.	7501 - 10,000 ft.	7501 - 10,000 ft.	
045	11U65	11U66	11K49	73W81	73W37	11K44	15Y66 (2-inch)
070	11U65	11U66	11K49	73W81	73W37	11K44	15Y66 (2-inch)
090	11U65	11U66	11K49	73W81	73W37	11K44	15Y66 (2-inch)

HIGH ALTITUDE DERATE

NOTE - Units may be installed at altitudes up to 10,000 ft.
At altitudes above 4501 ft. the unit must be derated to match the manifold pressure information shown below.
Units installed at altitudes of 4501 to 10,000 ft. require a pressure switch change.
Units installed at altitudes of 7501 to 10,000 ft. require an orifice change.
See the Gas Heat Accessories table for ordering information.

NOTE - This is the only permissible derate for these units.

NOTE - In Canada, certification for installations at elevations over 4500 feet is the jurisdiction of local authorities.

Input	Gas	Manifold Pressure in. w.g.					Supply Line Pressure in. w.g.	
		0 - 4500 ft.	4501 - 5500 ft.	5501 - 6500 ft.	6501 - 7500 ft.	7501 - 10,000 ft.	0 - 10,000 ft.	
All Sizes	Natural	3.5	3.3	3.2	3.1	3.5	4.5	13.0
	LPG/Propane	10.0	9.4	9.1	8.9	10.0	11.0	13.0

VENT LENGTHS - UNINSULATED EXHAUST PIPE IN UNCONDITIONED SPACE

[1] Winter Design Temperatures	Vent Pipe Diameter	Unit Input Size					
		045		070		090	
		Maximum Uninsulated Exhaust Vent Length (ft.)					
		PVC	PolyPro InnoFlue	PVC	PolyPro InnoFlue	PVC	PolyPro InnoFlue
32 to 21°F	1-1/2 in.	25	N/A	25	N/A	N/A	N/A
	2 in.	18	16	31	28	50	48
	2-1/2 in.	13	N/A	24	N/A	42	N/A
	3 in.	9	9	18	18	35	35
20 to 1°F	1-1/2 in.	15	N/A	20	N/A	N/A	N/A
	2 in.	9	8	18	16	32	29
	2-1/2 in.	5	N/A	13	N/A	24	N/A
	3 in.	N/A	N/A	8	8	19	19
0 to −20°F	1-1/2 in.	10	N/A	15	N/A	N/A	N/A
	2 in.	5	N/A	12	10	22	19
	2-1/2 in.	N/A	N/A	7	N/A	15	N/A
	3 in.	N/A	N/A	N/A	N/A	10	10

NOTE - Concentric terminations are equivalent to 5 ft. of straight pipe and should be included when measuring total pipe length.
[1] Refer to 99% Minimum Design Temperature table provided in the current edition of the ASHRAE Handbook-Fundamentals.
PolyPro® poly-propylene vent pipe is a registered trademark of DuraVent®.
Innoflue® is a registered trademark of Centrotherm Eco Systems.

OUTDOOR TERMINATION KIT USAGE

Input Size	Vent Pipe Diameter (in.)	Standard Terminations				Concentric Terminations		
		Flush Mount Kit	Wall Kit		Field Fabricated Exhaust Accelerator Size Required	Concentric Kit		
			2 inch	3 inch		1-1/2 inch	2 inch	3 inch
		51W11 (US) [5] 51W12 (CA)	22G44 (US) [5] 30G28 (CA)	44J40 (US) [5] 81J20 (CA)		71M80 (US) [5] 44W92 (CA)	69M29 (US) [5] 44W92 (CA)	60L46 (US) [5] 44W93 (CA)
045	[1] 1-1/2	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
	2	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
	2-1/2	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
	3	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
070	[1] 1-1/2	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
	2	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
	2-1/2	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
	3	[4] YES	YES	[2] YES	1-1/2 in.	[3] YES	- - -	- - -
090	2	[4] YES	- - -	YES	2 in.	- - -	YES	YES
	2-1/2	[4] YES	- - -	YES	2 in.	- - -	YES	YES
	3	[4] YES	- - -	YES	2 in.	- - -	YES	YES

NOTE - Standard Terminations do not include any vent pipe or elbows external to the structure.
Any vent pipe or elbows external to the structure must be included in total vent length calculations. See Vent Length Tables.

[1] 2 inch to 1-1/2 inch reducer required, must be field provided.

[2] Requires field provided 1-1/2 in. outdoor exhaust accelerator.

[3] Concentric Kits 71M80 and 44W92 include 1-1/2 in. outdoor exhaust accelerator, required when used with 045 and 070 input models. Accelerator is not used with 090 input models. NOTE - When using 1-1/2 in. piping, the pipe must be transitioned to 2 in. pipe when used with the Concentric Kit.

[4] Flush Mount Kit 51W11 and 51W12 includes 1-1/2 in. outdoor exhaust accelerator, required when used with all models. NOTE - When using 1-1/2 in. piping, the pipe must be transitioned to 2 in. pipe when used with the Flush Mount Kit.

[5] Termination Kits 30G28, 44W92, 44W93, 51W12 and 81J20 are certified to ULC S636 standard for use in Canada only.

VENT LENGTHS

STANDARD TERMINATION AT ELEVATION 0 - 10,000 ft.

Pipe Size		1-1/2 in.			2 in.			2-1/2 in.			3 in.		
Input		045	070	090	045	070	090	045	070	090	045	070	090
No. of 90 ELL	1	20	15	N/A	61	46	24	100	80	43	127	127	108
	2	15	10	N/A	56	41	19	95	75	38	122	122	103
	3	10	N/A	N/A	51	36	14	90	70	33	117	117	98
	4	N/A	N/A	N/A	46	31	N/A	85	65	28	112	112	93
	5	N/A	N/A	N/A	41	26	N/A	80	60	23	107	107	88
	6	N/A	N/A	N/A	36	21	N/A	75	55	18	102	102	83
	7	N/A	N/A	N/A	31	16	N/A	70	50	13	97	97	78
	8	N/A	N/A	N/A	26	11	N/A	65	45	N/A	92	92	73
	9	N/A	N/A	N/A	21	N/A	N/A	60	40	N/A	87	87	68
	10	N/A	N/A	N/A	10	N/A	N/A	55	35	N/A	82	82	63

CONCENTRIC TERMINATION ELEVATION 0 - 10,000 ft.

Pipe Size		1-1/2 in.			2 in.			2-1/2 in.			3 in.		
Input		045	070	090	045	070	090	045	070	090	045	070	090
No. of 90 ELL	1	15	10	N/A	53	38	22	90	70	39	111	111	104
	2	10	N/A	N/A	48	33	17	85	65	34	106	106	99
	3	N/A	N/A	N/A	43	28	12	80	60	29	101	101	94
	4	N/A	N/A	N/A	38	23	N/A	75	55	24	96	96	89
	5	N/A	N/A	N/A	33	18	N/A	70	50	19	91	91	84
	6	N/A	N/A	N/A	28	13	N/A	65	45	14	86	86	79
	7	N/A	N/A	N/A	23	N/A	N/A	60	40	N/A	81	81	74
	8	N/A	N/A	N/A	18	N/A	N/A	55	35	N/A	76	76	69
	9	N/A	N/A	N/A	13	N/A	N/A	50	30	N/A	71	71	64
	10	N/A	N/A	N/A	N/A	N/A	N/A	45	25	N/A	66	66	59

NOTES - Additional vent pipe and elbows used to terminate vent pipe outside the structure must be included in the total vent length calculation.
Intake and exhaust pipes are sized separately.
Values in table are for separate intake or exhaust pipe lengths.
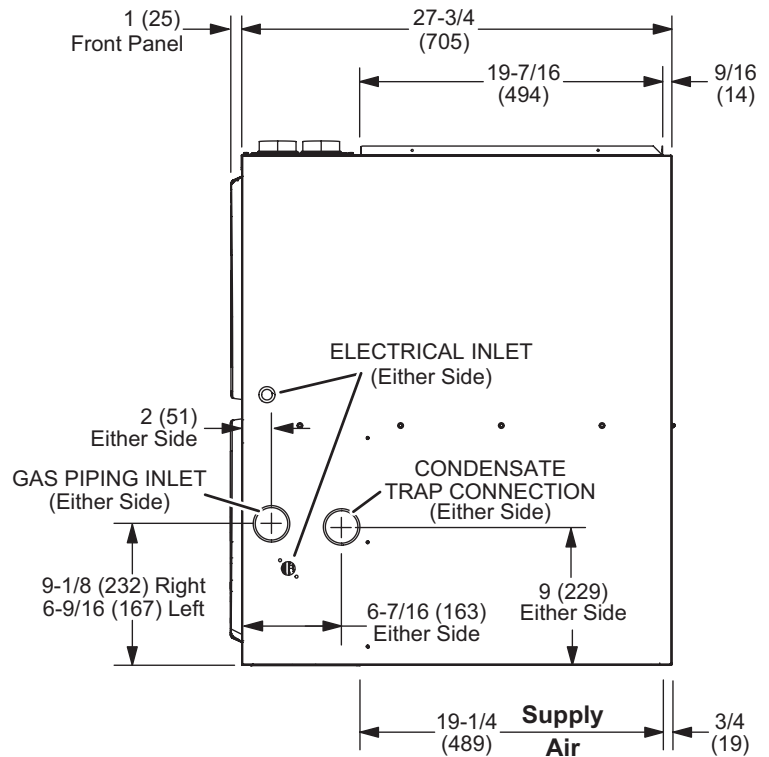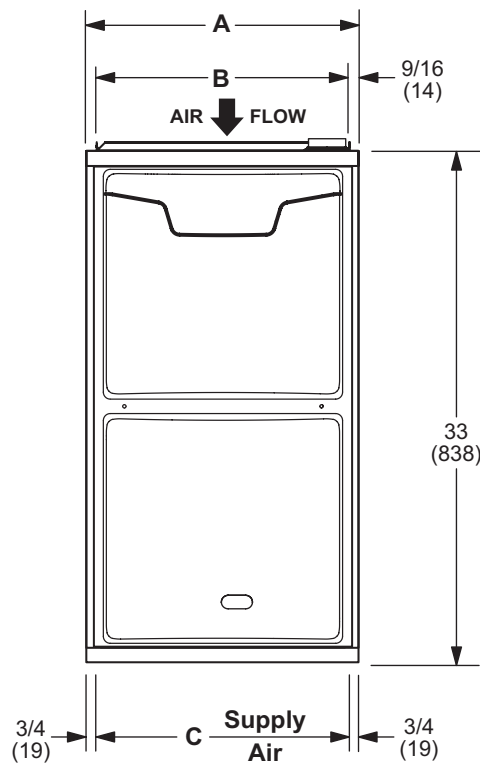Both intake and exhaust pipe must be the same size diameter.

VENT LENGTHS (EXHAUST) - VENTILATED ATTIC OR CRAWLSPACE INTAKE AIR - FEET

STANDARD TERMINATION AT ELEVATION 0 - 10,000 ft.

Pipe Size	1-1/2 in.			2 in.			2-1/2 in.			3 in.		
Input	045	070	090	045	070	090	045	070	090	045	070	090
No. of 90 ELL — 1	15	10	N/A	51	36	14	85	65	28	107	107	88
2	10	N/A	N/A	46	31	9	80	60	23	102	102	83
3	N/A	N/A	N/A	41	26	4	75	55	18	97	97	78
4	N/A	N/A	N/A	36	21	N/A	70	50	8	92	92	73
5	N/A	N/A	N/A	31	16	N/A	65	45	3	87	87	68
6	N/A	N/A	N/A	26	11	N/A	60	40	N/A	82	82	63
7	N/A	N/A	N/A	21	6	N/A	55	35	N/A	77	77	58
8	N/A	N/A	N/A	16	1	N/A	50	30	N/A	72	72	53
9	N/A	N/A	N/A	11	N/A	N/A	45	25	N/A	67	67	48
10	N/A	N/A	N/A	6	N/A	N/A	40	20	N/A	62	62	43

NOTES - Additional vent pipe and elbows used to terminate vent pipe outside the structure must be included in the total vent length calculation.

DIMENSIONS - UNIT

Flue Condensate Trap Assembly
Furnished for external field installation on either side of unit. (See installation instructions for additional information.)

7 (178)

TOP VIEW

9/16 (14)

COMBUSTION AIR INTAKE

EXHAUST AIR OUTLET

B **RETURN AIR OPENING**

2-1/16 (52)

2-1/4 (57)

5 (127)

9/16 (14)

FRONT VIEW

A

B

9/16 (14)

AIR FLOW

33 (838)

3/4 (19)

C **Supply Air**

3/4 (19)

SIDE VIEW

1 (25) Front Panel

27-3/4 (705)

19-7/16 (494)

9/16 (14)

ELECTRICAL INLET (Either Side)

2 (51) Either Side

GAS PIPING INLET (Either Side)

CONDENSATE TRAP CONNECTION (Either Side)

9-1/8 (232) Right
6-9/16 (167) Left

6-7/16 (163) Either Side

9 (229) Either Side

19-1/4 (489) **Supply Air**

3/4 (19)

Model No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ML193DF045XE36BK ML193DF070XE36BK	17-1/2	446	16-3/8	416	16	406
ML193DF090XE48CK	21	533	19-7/8	505	19-1/2	495

DOWNFLOW FILTER CABINET

"B AND "C" WIDTH FURNACES
(Two Filters)

FILTERS (2)

20-1/2 (521)

17-1/2 (445) "B" Box
21 (533) "C" Box

17-1/2 (445)

50-1/2 (1283)

33 (838)

FURNACE

FILTER ACCESS DOOR

NOTE: Return Air Opening (W x D)
"B" Box 16-1/2 x 19-5/8 (419 x 498)
"C" Box 20 x 19-5/8 (508 x 498)

DIMENSIONS - OPTIONAL ACCESSORIES

DOWNFLOW COMBUSTIBLE FLOORING BASE

TOP VIEW

SIDE VIEW

Cabinet Width	Catalog Number	A		B		C	
		in.	mm	in.	mm	in.	mm
B	11M60	19-9/16	497	16-9/16	421	18-3/4	476
C	11M61	23-1/16	586	20-1/16	510	22-1/4	565
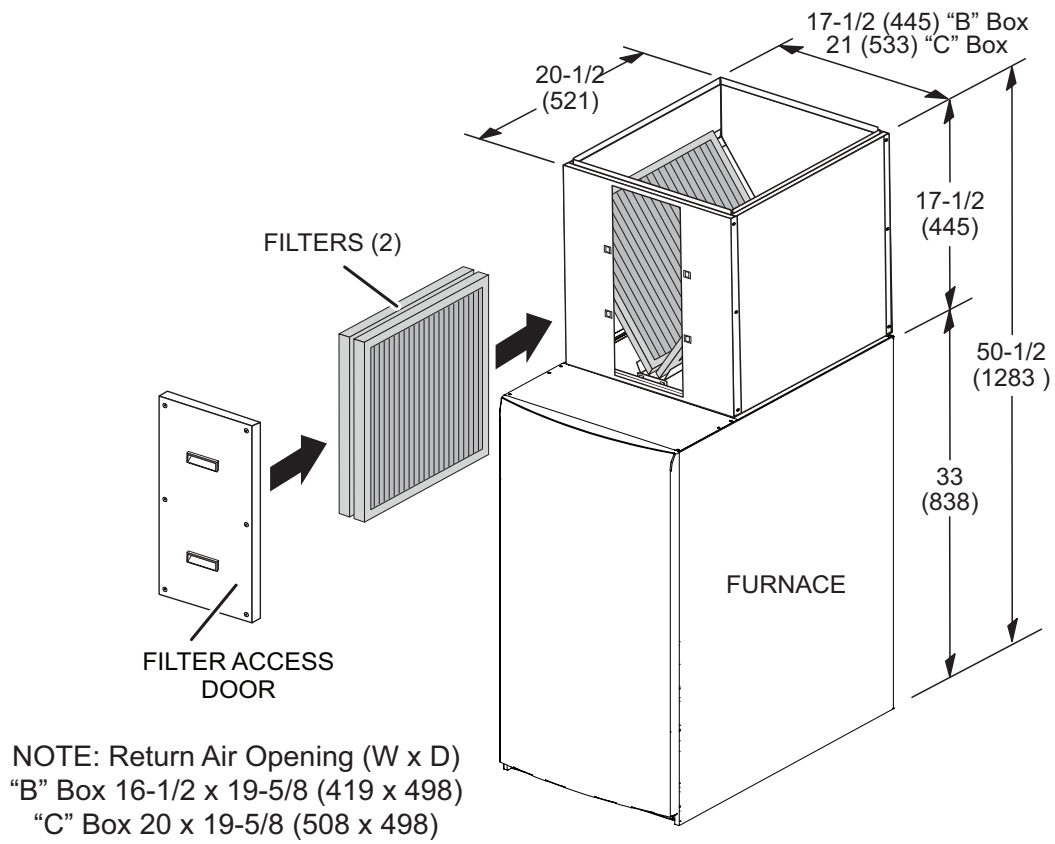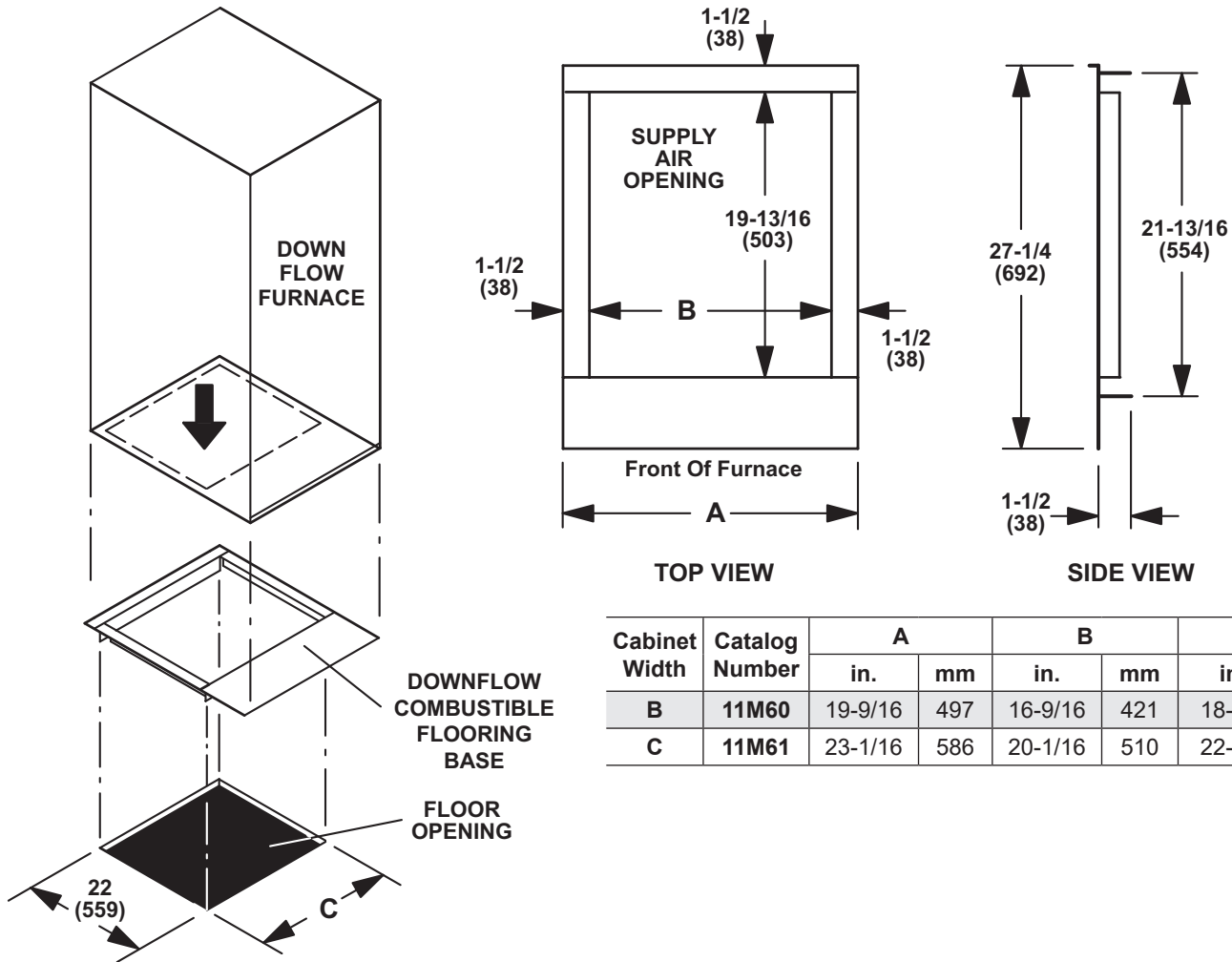
DIMENSIONS - FURNACE/COIL COMBINED DIMENSIONS

DOWNFLOW POSITION

Model		Coil/Furnace Width		Coil Height		Overall Height	
CK40DT	CRX35	in.	mm	in.	mm	in.	mm
CK40DT-24B	CRX35-24B	17-1/2	445	18	457	51	1295
CK40DT-30/36B	CRX35-30/36B	17-1/2	445	23-1/2	597	56-1/2	1435
CK40DT-30/36C	CRX35-30/36C	21	533	23-1/2	597	56-1/2	1435
CK40DT-42B	CRX35-42B	17-1/2	445	23-1/2	597	56-1/2	1435
CK40DT-48C	CRX35-48C	21	533	27-1/2	699	60-1/2	1537
CK40CT-50/60C	CRX35-50/60C	21	533	27-1/2	699	60-1/2	1537

DIMENSIONS - OPTIONAL ACCESSORIES - VENTING
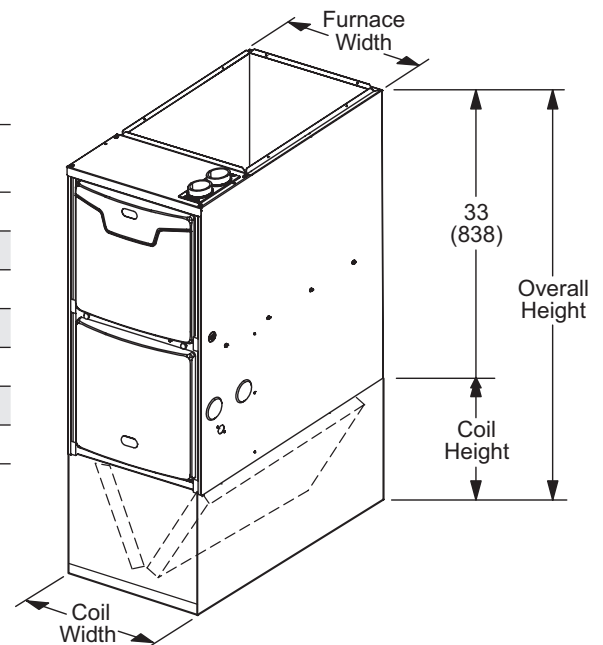
FLUSH-MOUNT VENT TERMINATION KIT 51W11 (US) or 51W12 (CANADA)

With 2 or 2-1/2 in. (51 or 64 mm) PVC pipe

Exhaust   Intake (Behind Plate)

With 3 in. (76 mm) PVC pipe

Exhaust   Intake (Behind Plate)

Seal all openings (typical)

2-3/8 (60)

12 (305) minimum (recommended)

2 (51) PVC pipe

3 (76) PVC pipe

NOTE - PVC pipe and fittings are not furnished and must be field furnished.

When required Use Field Provided 2-1/2 to 2 in. (64 to 51 mm) Coupling

2-1/2 (64) PVC pipe
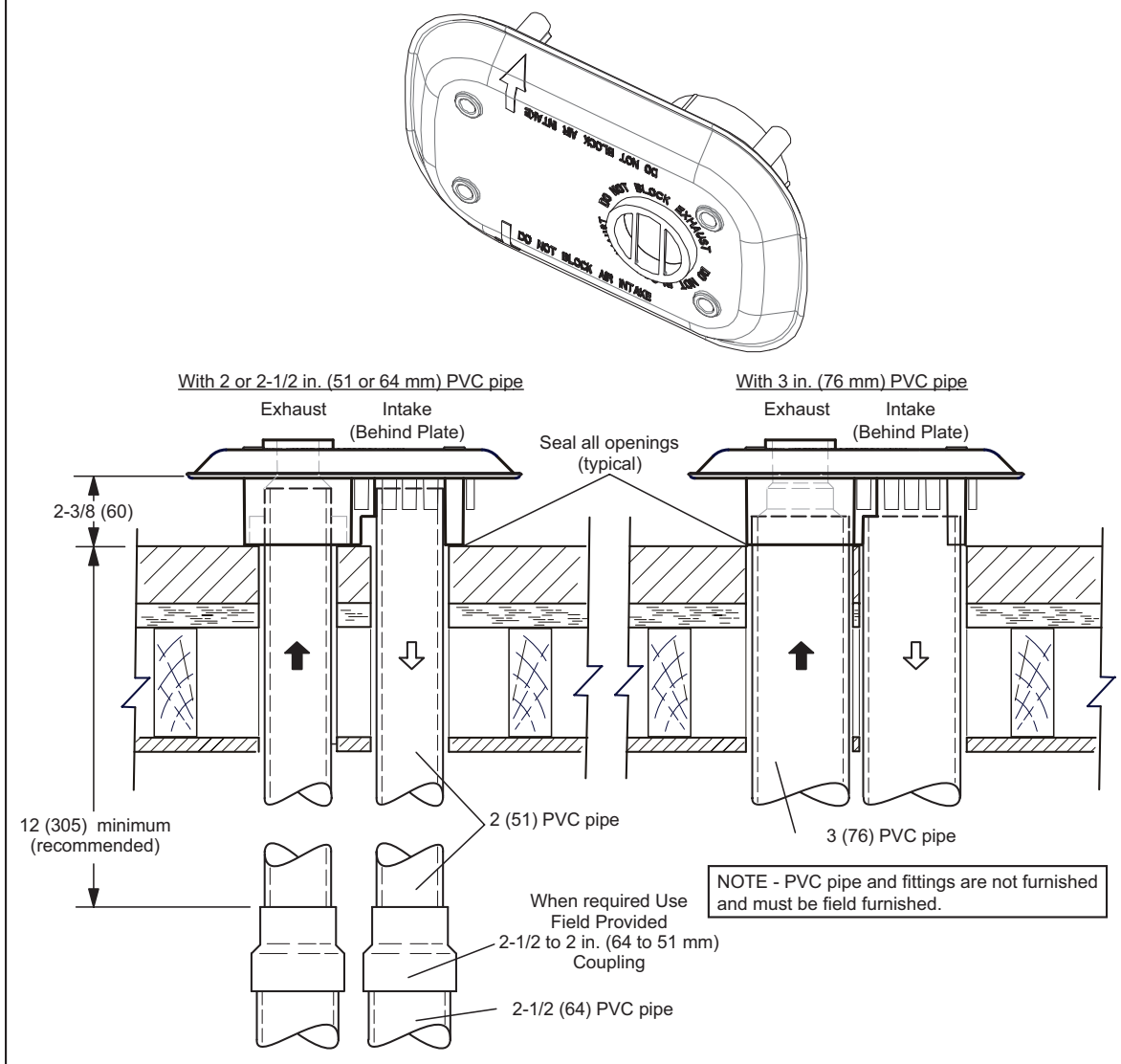
MUFFLERS
15Y66 - 2-inch

18-3/4 (476)

4-1/2 (114)

(Installed Vertically in the Exhaust Pipe)

CONCENTRIC WALL TERMINATION APPLICATIONS

OUTSIDE WALL
INTAKE AIR
EXHAUST AIR
EXHAUST AIR
INTAKE AIR
CLAMP (Not Furnished)
INTAKE AIR
12 (305) Minimum Above Grade or Average Snow Accumulation
GRADE
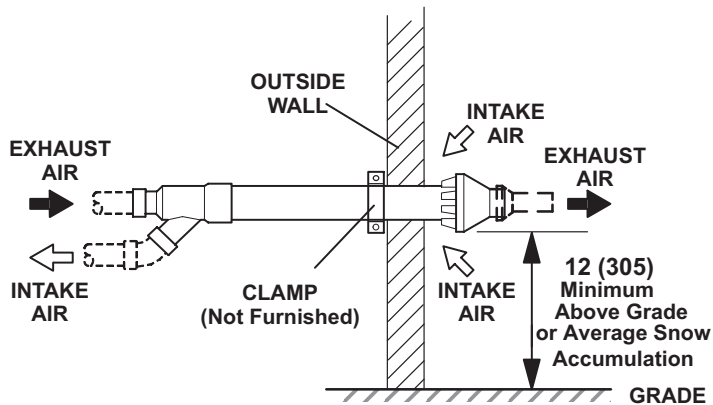
CONCENTRIC ROOF TERMINATION APPLICATIONS

FLASHING (Not Furnished)
12 (305) Minimum Above Average Snow Accumulation
CLAMP
SHEET METAL STRAP (Clamp and sheet metal strap must be field installed to support the weight of the termination kit.)
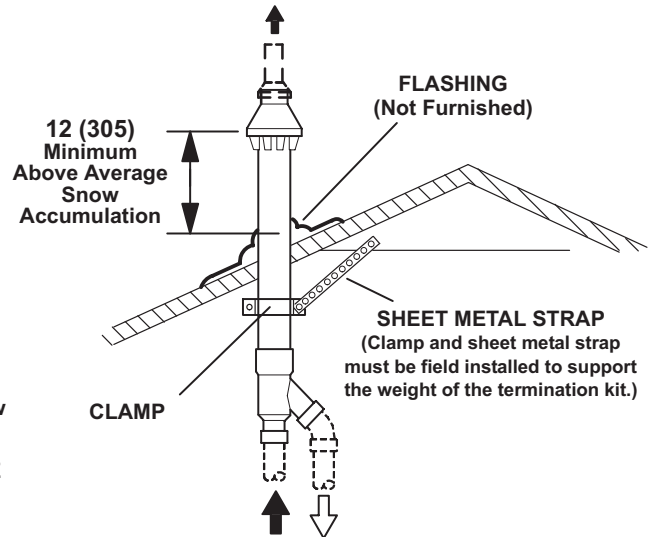
71M80 / 69M29 / 44W92 − 2 inch kits
60L46 / 44W93 − 3 inch kits
See Installation Instructions for additional information.

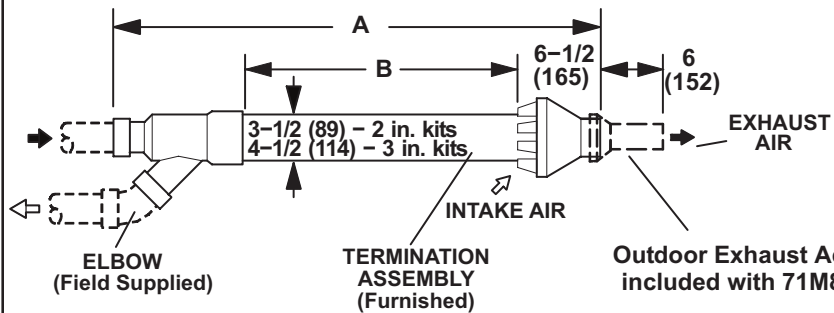Note - Field provided reducer may be required to adapt different vent pipe sizes to termination.

A
B
6−1/2 (165)
6 (152)
3−1/2 (89) − 2 in. kits
4−1/2 (114) − 3 in. kits
EXHAUST AIR
INTAKE AIR
ELBOW (Field Supplied)
TERMINATION ASSEMBLY (Furnished)
Outdoor Exhaust Accelerator included with 71M80/44W92

Cat. No.	A		B	
	in.	mm	in.	mm
71M80 69M29	33−3/8	848	16−3/4	425
44W92 (Canada)	29	737	15−1/2	394
60L46	38−7/8	987	21−3/16	538
44W93 (Canada)	36−1/8	918	19−1/2	495

NOTE − Typical illustration for dimensions only. Design may vary depending on kit ordered.
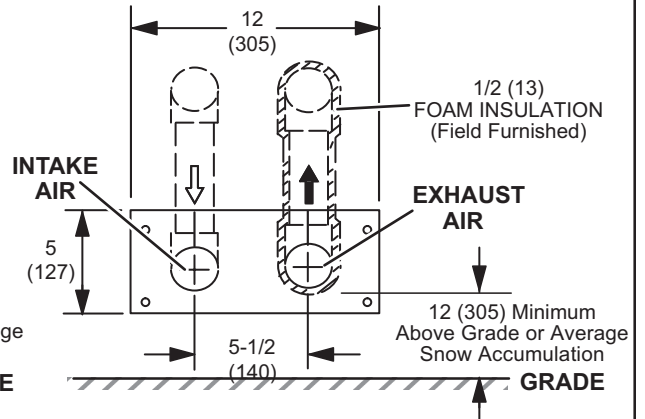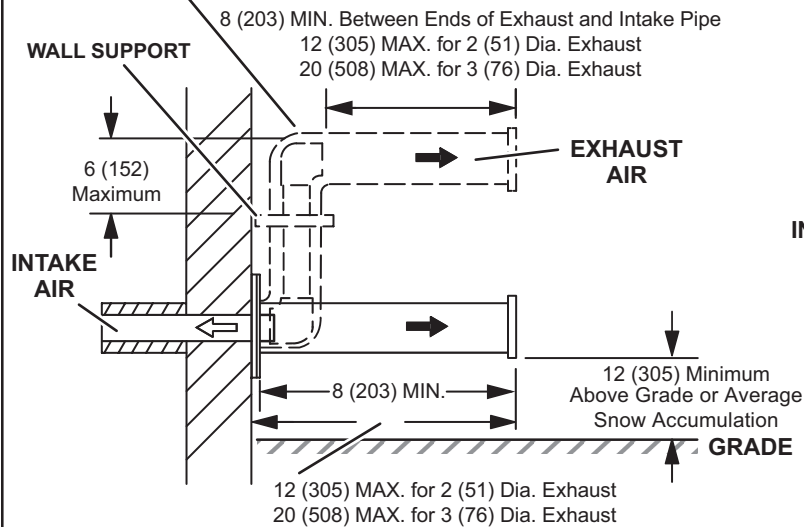
WALL TERMINATION KITS (CLOSE-COUPLE)
EXTENDED VENT FOR GRADE CLEARANCE
2 inch (51 mm) 22G44 (US)
3 inch (76 mm) 44J40 (US)
See Installation Instructions for additional information.
Note - Field provided reducer may be required to adapt different vent pipe sizes to termination.

If Intake and Exhaust Pipe is less than12 in. (305 mm)
above snow accumulation or other obstructions,
field fabricated piping must be installed.

8 (203) MIN. Between Ends of Exhaust and Intake Pipe
12 (305) MAX. for 2 (51) Dia. Exhaust
20 (508) MAX. for 3 (76) Dia. Exhaust

WALL SUPPORT

6 (152) Maximum

EXHAUST AIR

INTAKE AIR

8 (203) MIN.

12 (305) Minimum Above Grade or Average Snow Accumulation

GRADE

12 (305) MAX. for 2 (51) Dia. Exhaust
20 (508) MAX. for 3 (76) Dia. Exhaust

12 (305)

1/2 (13) FOAM INSULATION (Field Furnished)

INTAKE AIR

EXHAUST AIR

5 (127)

12 (305) Minimum Above Grade or Average Snow Accumulation

5-1/2 (140)

GRADE

WALL TERMINATION KITS (CLOSE-COUPLE)
EXTENDED VENT FOR GRADE CLEARANCE
2 inch (51 mm) 30G28 (WTK Canada)
3 inch (76 mm) 81J20 (WTK Canada)
See Installation Instructions for additional information.
Note - Field provided reducer may be required to adapt different vent pipe sizes to termination.

If Intake and Exhaust Pipe is less than 12 in. (305 mm)
above snow accumulation or other obstructions,
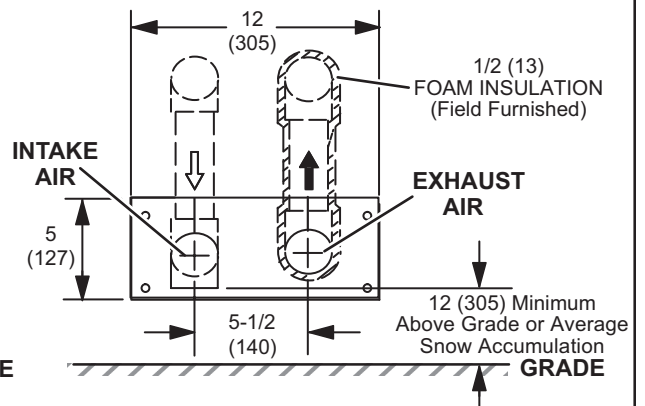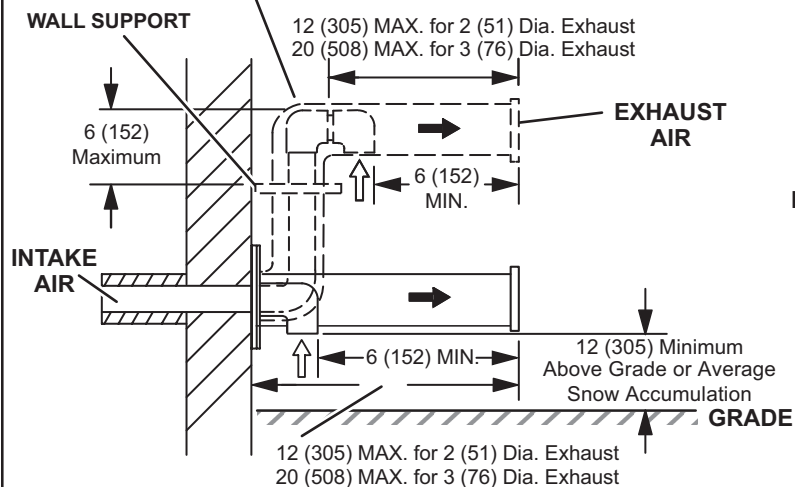field fabricated piping must be installed.

WALL SUPPORT

12 (305) MAX. for 2 (51) Dia. Exhaust
20 (508) MAX. for 3 (76) Dia. Exhaust

6 (152) Maximum

EXHAUST AIR

6 (152) MIN.

INTAKE AIR

6 (152) MIN.

12 (305) Minimum Above Grade or Average Snow Accumulation

GRADE

12 (305) MAX. for 2 (51) Dia. Exhaust
20 (508) MAX. for 3 (76) Dia. Exhaust

12 (305)

1/2 (13) FOAM INSULATION (Field Furnished)

INTAKE AIR

EXHAUST AIR

5 (127)

12 (305) Minimum Above Grade or Average Snow Accumulation

5-1/2 (140)

GRADE

BLOWER DATA

ML193DF045XE36BK PERFORMANCE (Less Filter)

External Static Pressure in. w.g.	Air Volume / Watts at Various Blower Speeds									
	High (Black)		Medium-High (Brown)		Medium (Blue)		Medium-Low (Yellow)		Low (Red)	
	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts
0.10	1376	357	1247	281	1101	203	918	122	744	78
0.20	1349	365	1223	287	1074	210	890	125	712	81
0.30	1324	372	1199	294	1048	216	854	131	672	86
0.40	1295	381	1172	302	1018	223	824	136	631	91
0.50	1272	389	1143	311	992	230	786	141	596	95
0.60	1253	395	1121	317	961	237	764	146	528	100
0.70	1226	404	1096	325	932	243	704	150	517	103
0.80	1202	411	1074	333	898	251	688	157	466	107
0.90	1177	420	1041	341	876	256	659	160	436	111
1.00	1146	431	1014	348	833	262	634	163	392	116

ML193DF070XE36BK PERFORMANCE (Less Filter)

External Static Pressure in. w.g.	Air Volume / Watts at Various Blower Speeds									
	High (Black)		Medium-High (Brown)		Medium (Blue)		Medium-Low (Yellow)		Low (Red)	
	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts
0.10	1413	355	1283	280	1132	203	908	119	756	78
0.20	1384	365	1264	286	1109	209	882	124	708	83
0.30	1365	373	1241	294	1078	216	852	129	676	87
0.40	1340	379	1212	302	1051	223	802	136	648	90
0.50	1318	388	1185	309	1024	228	771	141	574	97
0.60	1291	396	1166	315	995	234	732	145	524	100
0.70	1274	402	1143	321	963	241	716	148	479	105
0.80	1243	411	1099	332	925	248	650	156	452	108
0.90	1226	416	1077	338	909	254	635	158	407	112
1.00	1199	425	1056	344	874	260	578	163	299	103

ML193DF090XE48CK PERFORMANCE (Less Filter)

External Static Pressure in. w.g.	Air Volume / Watts at Various Blower Speeds									
	High (Black)		Medium-High (Brown)		Medium (Blue)		Medium-Low (Yellow)		Low (Red)	
	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts
0.10	1701	437	1477	302	1364	241	1289	207	1158	160
0.20	1673	445	1444	310	1335	248	1255	213	1123	166
0.30	1640	455	1430	318	1299	257	1215	220	1085	173
0.40	1611	463	1370	326	1266	264	1178	227	1035	180
0.50	1586	470	1351	334	1230	274	1147	235	1003	187
0.60	1542	480	1313	343	1185	282	1088	244	957	195
0.70	1519	488	1289	351	1156	288	1057	251	908	204
0.80	1485	496	1255	359	1122	296	1007	258	878	207
0.90	1468	509	1225	367	1071	307	964	264	788	214
1.00	1417	513	1184	376	1075	309	924	270	784	218

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