### GAS FURNACES



## ML180DF MERIT® SERIES

Downflow

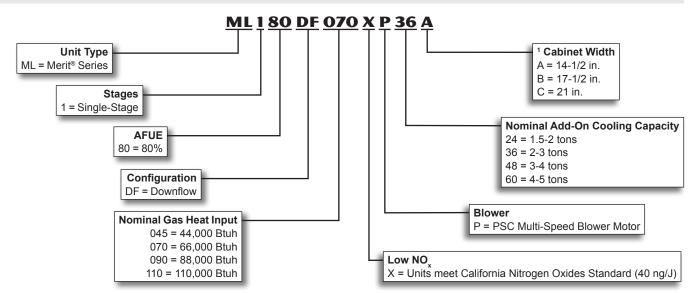
PRODUCT SPECIFICATIONS

Bulletin No. 210643
April 2019
Supersedes October 2018



AFUE - 80% Input - 44,000 to 110,000 Btuh Nominal Add-on Cooling - 1.5 to 5 Tons

### **MODEL NUMBER IDENTIFICATION**



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

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# NOTE - ML180DF FURNACES ARE NOT AVAILABLE IN CANADA!

#### **WARRANTY**

**Duralok™ Aluminized Steel Heat Exchanger -** Limited twenty year warranty in residential applications, ten years in non-residential applications.

**All other covered components -** Limited five year warranty in residential applications, one year in non-residential applications.

Refer to Lennox Equipment Limited Warranty certificate included with equipment for details.

#### **APPROVALS**

Units are Certified by AHRI.

Units tested and rated according to US DOE test procedures and FTC labeling regulations.

"X" models approved by the California Energy Commission and meet California Seasonal Efficiency requirements and California Nitrogen Oxides (NO<sub>x</sub>) Standards.

ISO 9001 Registered Manufacturing Quality System. Blower data from unit tests conducted in Lennox Laboratory air test chamber.

#### **California Only**

If installed in South Coast Air Quality Management District (SCAQMD) only:

This furnace <u>does not</u> meet the SCAQMD Rule 1111  $NO_x$  emission limit (14 ng/J), and thus is subject to a mitigation fee of up to \$450. This furnace is not eligible for the Clean Air Furnace Rebate Program:

#### www.CleanAirFurnaceRebate.com.

If installed in San Joaquin Valley Air Pollution Control District (SJVAPCD) only:

This furnace does not meet the SJVAPCD Rule 4905  $\rm NO_x$  emission limit (14 ng/J), and thus is subject to a mitigation fee of up to \$450.



### **APPLICATIONS**

Input capacities of 44,000, 66,000, 88,000 and 110,000 Btuh.

Energy efficiency (AFUE) of 80%.

Compact cabinet for downflow applications without any internal modifications to the unit.

Lennox add-on indoor coils, high-efficiency air cleaners and humidifiers can easily be added to furnace.

Shipped factory assembled with all controls installed and wired.

Each unit factory test operated to ensure proper operation.

#### **HEATING SYSTEM**

1 Lennox Duralok™ Heat Exchanger Assembly Heavy gauge aluminized steel heat exchanger.

Crimped seam clamshell type design.

Designed for normal expansion and contraction.



Minimum resistance to air flow.

Heat exchanger has been laboratory life cycle tested in excess of industry standards.

Compact size of heat exchanger permits low overall design of furnace cabinet.

### 2 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 is removable from the unit as a single component for ease of service.

### 3 SureLight® Hot Surface Ignitor

Tough, reliable, long-life, trouble-free performance. Silicon nitride ignitor.

### 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.

### 6 Combustion Air Inducer

Shaded pole heavy duty blower prepurges heat exchanger and safely vents flue products.

Pressure switch proves blower operation before allowing gas valve to open.

Operates only during heating cycle.

### **6** Flame Rollout Switch

Manual reset switch is factory installed on the front of the burner box.

Switches provides protection from abnormal operating conditions.

#### **Limit Controls**

Automatic reset, primary and secondary limits are accurately located.

Primary limit factory installed on vestibule panel on all units, secondary limit factory installed on blower housing.

#### **Optional Accessories**

### **High Altitude Pressure Switch Kit**

Required on most units for proper unit operation at altitudes from 4,501 to 7500 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.

### **BLOWER**

Multi-Speed direct drive blower.

Statically and dynamically balanced.

Resiliently mounted.

Blower assembly easily removed for servicing.

Motor is controlled by the Integrated Furnace Control.

Blower speeds are easily changed on the integrated furnace control. See blower performance tables.

### **8** CONTROLS

#### **SureLight® Integrated Furnace Control**

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.

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).

For air-conditioning applications, blower is automatically energized on thermostat demand for cooling.

Integrated furnace control has one red LED to indicate status and indicate diagnostic codes. Push button recall of the last 5 diagnostic codes aids in troubleshooting.

Integrated furnace control has built-in twinning capability ("TWIN" terminal on control) to operate two furnaces simultaneously without any additional controls. A field supplied isolation relay is required to operate the twinned (no thermostat connection) furnace.

Two accessory terminals furnished for additional power supply requirements for 120 volt (less than 1 amp) power humidifiers and powered air cleaners.

#### 24 Volt Transformer

9 Furnished and factory installed on outside of control box. 40VA transformer has fuse 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 on right side of furnace.

### **Optional Accessories**

#### iComfort® M30 Smart Wi-Fi Thermostat

Wi-Fi-enabled, electronic 7-day, universal, multi-stage,

7:28 pm

Ħ

65°

LENNOX

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, ML180DF / Page 4

*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.

Amazon® Alexa-enabled, smart-home-compatible. It works with Amazon Echo, Echo Dot and Tap devices.

Wi-Fi remote monitoring and adjustment through a home wireless network for desktop PCs, laptops and apps for smartphones or tablets.

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

#### **Remote Outdoor Temperature Sensor**

Used with the iComfort® M30 Smart Thermostat.

When installed outdoors, sensor allows thermostat to display outdoor temperature. Sensor is auto-detected when connected to thermostat.

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



#### **Thermostat**

Thermostat (programmable/non-programmable) is not furnished with unit.

See Thermostat bulletins in Controls Section and Lennox Price Book for selection.

### **CABINET**

Low-profile, narrow width cabinet allows easy installation in downflow applications.

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.

Insulated cabinet with foil faced insulation on sides and back of heating compartment.

Complete service access.

Safety interlock switch automatically shuts off power to unit when blower compartment access panel is removed.

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**

### **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.

"A" width cabinet includes one filter.

"B and "C" width cabinets have two filters.

Filter rails are furnished.

Front access for servicing.

Cleanable filter(s) are furnished.

SPECIFIC	CATIONS			
Gas Heating	Model No. Model No Low NO <sub>x</sub>	ML180DF045P24A 	ML180DF045P36A 	ML180DF070P36A ML180DF070XP36A
Performance	AHRI Ref. No. Non "X" Models	5338816	5202436	5202437
	"X" Models			5338848
	<sup>1</sup> AFUE	80%	80%	80%
	Input - Btuh	44,000	44,000	66,000
	Output - Btuh	35,000	36,000	53,000
	Temperature rise range - °F	25 - 55	15 - 45	25 - 55
	Gas Manifold Pressure (in. w.g.)  Nat. Gas / LPG/Propane	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0
High Static - i	n. w.g.	0.50	0.50	0.50
Connections	Flue connection - in. round	4	4	4
n.	Gas pipe size IPS	1/2	1/2	1/2
ndoor	Wheel nom. dia. x width - in.	10 x 7	10 x 8	10 x 8
Blower	Motor output - hp	1/5	1/3	1/3
	Tons of add-on cooling	1.5 - 2	2 - 3	2 - 3
	Air Volume Range - cfm	401 - 1157	739 - 1524	717 - 1562
Electrical	Voltage		120 volts - 60 hertz - 1 phase	e
Data	Blower motor full load amps	3.1	6.1	6.1
	Maximum overcurrent protection	15	15	15
Shipping Data	a lbs 1 package	105	113	128

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

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

SPECIFIC	CATIONS			
Gas Heating	Model No. Model No Low $\mathrm{NO_x}$	ML180DF090P36B	ML180DF090P48B ML180DF090XP48B	ML180DF110P60C ML180DF110XP60C
Performance	AHRI Ref. No. Non "X" Models	5338849	5338852	5202439
	"X" Models		5338853	5338854
	<sup>1</sup> AFUE	80%	80%	80%
	Input - Btuh	88,000	88,000	110,000
	Output - Btuh	71,000	71,000	89,000
	Temperature rise range - °F	35 - 65	25 - 55	30 - 60
	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	Flue connection - in. round	4	4	4
in.	Gas pipe size IPS	1/2	1/2	1/2
Indoor	Wheel nom. dia. x width - in.	10 x 9	10 x 10	11-1/2 x 10
Blower	Motor output - hp	1/3	1/2	1
	Tons of add-on cooling	2 - 3	3 - 4	4 - 5
	Air Volume Range - cfm	743 -1695	917 - 1929	1517 - 2760
Electrical	Voltage		120 volts - 60 hertz - 1 phase	;
Data	Blower motor full load amps	6.1	8.2	10.0
	Maximum overcurrent protection	15	15	15
Shipping Dat	a lbs 1 package	131	140	160

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

<sup>&</sup>lt;sup>1</sup> Annual Fuel Utilization Efficiency based on DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces.

OPTIONAL ACCESSORIES - ORDER SEPARATELY									
	"A" Width Models	"B" Width Models	"C" Width Models						
CABINET ACCESSORIES									
<b>Downflow Combustible Flooring Base</b>	11M59	11M60	11M61						
CONTROLS									
iComfort® M30 Smart Wi-Fi Thermostat	<b>15Z69</b>	15Z69	<b>15Z69</b>						
Remote Outdoor Air Temperature Sensor	X2658	X2658	X2658						
FILTERS									
<sup>1</sup> Downflow Filter Cabinet	51W06	51W07	51W08						
No. and Size of	filter - in. (1) 20 x 20 x 1	(2) 20 x 16 x 1	(2) 20 x 16 x 1						
NIGHT SERVICE KIT									
Night Service Kit	68W80	68W80	68W80						

<sup>&</sup>lt;sup>1</sup> Cleanable polyurethane, frame-type filter.

GAS H	GAS HEAT ACCESSORIES											
Input	ı	High Altitude Natural Gas to Pressure Switch Kit LPG/Propane Kit				LPG/Propane to Natural Gas Kit	Natural Gas High Altitude Orifice Kit					
	0 - 4500 ft.	4501 - 7500 ft.	7501 - 10,000 ft.	0 - 7500 ft.	7501 - 10,000 ft.	0 - 7500 ft.	7501 - 10,000 ft.					
045	No Change	No Change	80W51	11K49	11K44	73W81	73W37					
070	No Change	80W52	80W51	11K49	11K44	73W81	73W37					
090	No Change	No Change	80W51	11K49	11K44	73W81	73W37					
090X	No Change	80W52	80W51	11K49	11K44	73W81	73W37					
110	No Change	80W52	80W51	11K49	11K44	73W81	73W37					

### **HIGH ALTITUDE DERATE**

NOTE - Units may be installed at altitudes up to 4500 ft. above sea level without any modifications.

At altitudes above 4500 ft. units must be derated to match information in the shaded areas shown below.

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

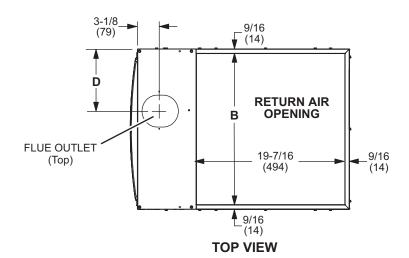
		Gas Ma	Line Pressure - in. w.g.						
Input	0 - 4500 Feet		4501 - 7500 Feet		7501 - 10,000 ft.		Minimum		
,	Natural Gas	LPG/ Propane	Natural Gas	LPG/ Propane	<sup>1</sup> Natural Gas	LPG/ Propane	Natural Gas	LPG/ Propane	Maximum
045	3.5	10	3.5	10	3.5	10	4.5	11	13
070	3.5	10	3.3	10	3.5	10	4.5	11	13
090	3.5	10	3.3	10	3.5	10	4.5	11	13
110	3.5	10	3.3	10	3.5	10	4.5	11	13

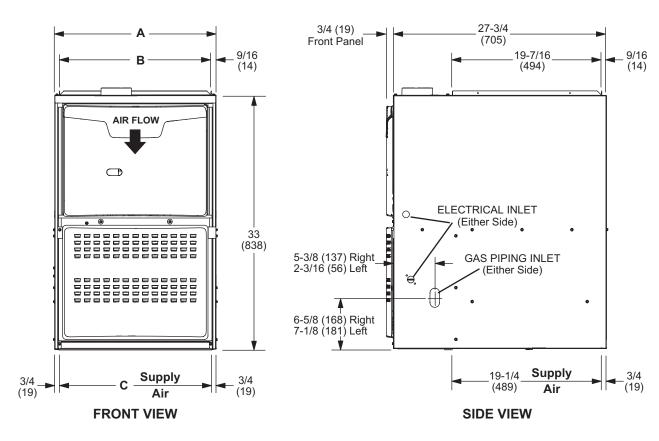
<sup>&</sup>lt;sup>1</sup> Natural Gas High Alitude Orifice Kit required.

**INSTALLATION CLEARANCES** 

Vent Type	Type B1	Type C		
Sides	0 in. (0 mm)	<sup>1</sup> in. (0 mm)		
Rear	0 in. (0 mm)	0 in. (0 mm)	_	
Тор	1 in. (25 mm)	1 in. (25 mm)	_ <sub>1</sub>	
Front	2-1/4 in. (57 mm)	2-1/4 in. (57 mm)	2	
Front (service/alcove)	24 in. (610 mm)	24 in. (610 mm)	_	
Floor	<sup>2</sup> Combustible	<sup>2</sup> Combustible	_	
Flue	1 in. (25 mm)	6 in. (152 mm)	_	

- NOTE Air for combustion must conform to the methods outlined in the National Fuel Gas Code (NFPA 54/ANSI-Z223.1).
- 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.
- <sup>1</sup> Left side requires 4 in. if single wall vent is used on 14-1/2 in. "A" width cabinets, 2 in. on 17-1/2 in. "B" width cabinets.
- <sup>2</sup> 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, National Fuel Gas Code ANSI-Z223.1 or National Standard of Canada CAN/CSA-B149.1 and CAN/CSA-B149.2 Installation Code for Gas Burning Appliances". Do not install the furnace directly on carpeting, tile, or other combustible materials other than wood flooring.

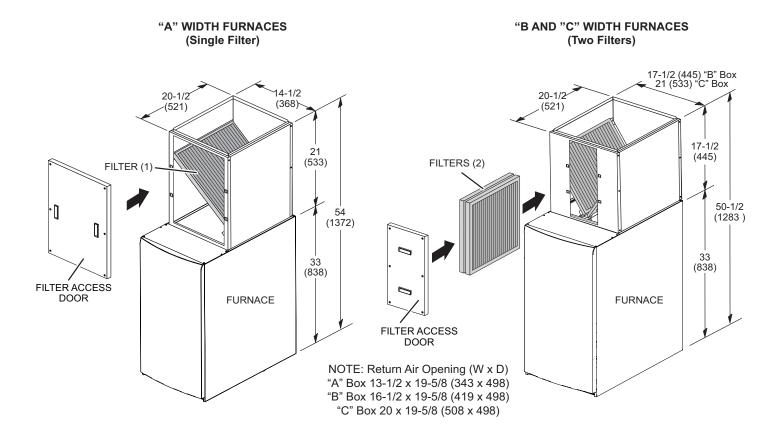




Model No.	A		В		С		D	
woder No.	in.	mm	in.	mm	in.	mm	in.	mm
ML180DF045P24A								
ML180DF045P36A	14-1/2	368	13-3/8	340	13	330	4-3/4	121
ML180DF070P36A								
ML180DF090P36B	47.4/0	440	10.0/0	440	10	400	0.4/4	450
ML180DF090P48B	17-1/2	446	16-3/8	416	16	406	6-1/4	159
ML180DF110P60C	21	533	19-7/8	505	19-1/2	495	8	203

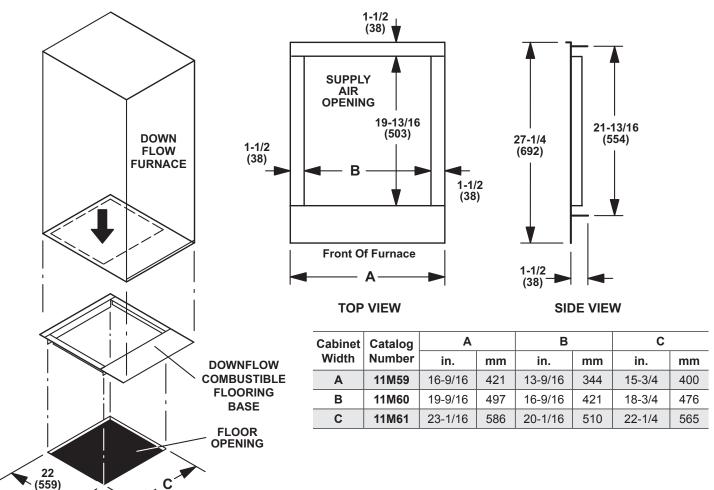
### **OPTIONAL ACCESSORY DIMENSIONS**

#### **DOWNFLOW FILTER CABINET**

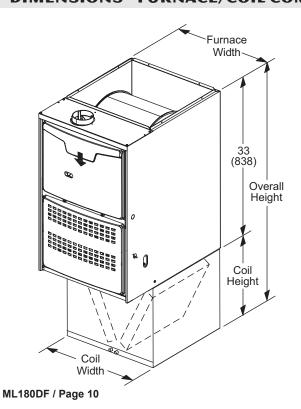


### **OPTIONAL ACCESSORY DIMENSIONS**

### **DOWNFLOW COMBUSTIBLE FLOORING BASE**



### **DIMENSIONS - FURNACE/COIL COMBINED DIMENSIONS**



Model Number	Coil Width		Furnace Width		Coil Height		Overall Height	
	in.	mm	in.	mm	in.	mm	in.	mm
CR33-18A-F	17-1/2	446	14-1/2	368	14-1/8	359	47-1/8	1197
CR33-24A-F	17-1/2	446	14-1/2	368	14-1/8	359	47-1/8	1197
CR33-24B-F	17-1/2	446	17-1/2	446	14-1/8	359	47-1/8	1197
CR33-30/36A-F	17-1/2	446	14-1/2	368	16-1/8	410	49-1/8	1248
CR33-30/36B-F	17-1/2	446	17-1/2	446	16-1/8	410	49-1/8	1248
CR33-30/36C-F	21	533	21	533	16-1/8	410	49-1/8	1248
CR33-48B-F	21	533	17-1/2	446	20	508	53	1346
CR33-48C-F	21	533	21	533	20	508	53	1346
CR33-50/60C-F	24-1/2	622	21	533	23-5/8	600	56-5/8	2276

### **BLOWER DATA**

### ML180DF045P24A PERFORMANCE (Less Filter)

External	Air Volume / Watts at Various Blower Speeds									
Static Pressure	High		Medium- High		Medium- Low		Low			
in. w.g.	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts		
0.10	1157	399	938	333	764	273	699	243		
0.20	1120	381	924	322	745	264	677	237		
0.30	1084	362	890	311	723	258	650	230		
0.40	1027	349	864	298	695	250	633	224		
0.50	975	334	814	283	674	238	605	215		
0.60	902	322	764	268	623	225	564	203		
0.70	831	305	682	248	549	208	477	186		
0.80	713	280	576	228	470	192	401	171		

### ML180DF045P36A PERFORMANCE (Less Filter)

External	Air Volume / Watts at Various Blower Speeds								
Static Pressure	High		Medium- High		Medium- Low		Low		
in. w.g.	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	
0.10	1524	567	1385	528	1144	431	947	366	
0.20	1465	542	1351	490	1129	407	943	354	
0.30	1414	517	1293	463	1111	393	950	341	
0.40	1343	489	1236	436	1083	371	945	329	
0.50	1255	464	1190	409	1038	356	897	311	
0.60	1205	443	1106	380	999	333	870	292	
0.70	1140	421	1059	366	943	317	816	275	
0.80	1031	388	962	335	870	297	739	252	

### ML180DF070P36A PERFORMANCE (Less Filter)

	1									
External	Air Volume / Watts at Various Blower Speeds									
Static Pressure	High		Medium- High		Medium- Low		Low			
in. w.g.	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts		
0.10	1562	591	1386	539	1159	436	956	374		
0.20	1506	553	1355	504	1149	418	953	361		
0.30	1459	528	1314	473	1119	392	941	343		
0.40	1390	500	1264	442	1082	374	915	323		
0.50	1306	477	1200	415	1048	352	904	305		
0.60	1213	441	1129	391	987	332	849	288		
0.70	1140	417	1066	361	901	304	798	270		
0.80	1038	395	975	342	836	283	717	244		

### ML180DF090P36B PERFORMANCE (Less Filter)

External	Air ۱	Volume	/ Watts at Various Blower Speeds						
Static Pressure	High		Medium- High		Medium- Low		Low		
in. w.g.	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	
0.10	1695	647	1431	546	1180	468	973	379	
0.20	1641	611	1405	516	1162	443	967	368	
0.30	1595	589	1384	492	1146	420	958	349	
0.40	1525	548	1344	472	1136	399	954	337	
0.50	1438	515	1271	432	1110	374	929	319	
0.60	1370	489	1197	400	1057	352	886	299	
0.70	1260	451	1119	374	983	328	823	273	
0.80	1164	425	1020	344	900	300	743	249	

### ML180DF090P48B PERFORMANCE (Less Filter)

External	Air ۱	Volume	e / Watts at Various Blower Speeds						
Static Pressure	High		Medium- High		Medium- Low		Low		
in. w.g.	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	
0.10	1929	755	1794	668	1585	572	1332	489	
0.20	1864	717	1745	623	1544	540	1321	463	
0.30	1779	683	1676	588	1496	510	1296	440	
0.40	1694	647	1600	558	1443	473	1265	417	
0.50	1596	607	1502	511	1363	440	1212	393	
0.60	1483	577	1413	485	1258	406	1148	370	
0.70	1340	544	1273	449	1148	374	1042	339	
0.80	1221	505	1138	416	1018	350	917	307	

### ML180DF110P60C PERFORMANCE (Less Filter)

	External	Air Volume / Watts at Various Blower						er Sp	er Speeds	
Static Pressure		High		Medium- High		Medium- Low		Low		
	in. w.g.	cfm	Watts	cfm	Watts	cfm	Watts	cfm	Watts	
	0.10	2760	1401	2325	1045	1888	871	1531	686	
	0.20	2670	1362	2319	1003	1937	847	1565	679	
	0.30	2557	1292	2257	964	1945	832	1605	674	
	0.40	2536	1287	2220	949	1935	812	1622	661	
	0.50	2384	1230	2152	911	1918	782	1626	644	
	0.60	2273	1191	2063	884	1884	762	1617	630	
	0.70	2197	1151	2021	875	1822	737	1574	610	
	0.80	2115	1140	1950	854	1749	708	1517	579	

REVISIONS				
Sections	Description of Change			
Controls	Added iComfort® M30 Smart Thermostat and Remote Outdoor Temperature Sensor.			







Visit us at www.lennox.com

For the latest technical information, <a href="www.LennoxPROs.com">www.LennoxPROs.com</a> Contact us at 1-800-4-LENNOX