

AIR CONDITIONERS



Two-Stage Compressor | Quantum™ Coil | **R-410A** | Three-Phase | 60Hz

ML18XC2

MERIT® SERIES

COMMERCIAL
PRODUCT SPECIFICATIONS (EHB)

SEER2 up to 17.0

3 to 5 Tons

Cooling Capacity - 32,800 to 58,000 Btuh



MERIT® SERIES



MODEL NUMBER IDENTIFICATION

ML 18 X C 2 - 036 - 233 A 01

Product Tier
ML = Merit® Series

Nominal Efficiency

Refrigerant
X = R-410A

Unit Type
C = Air Conditioner

Cooling Stages
2 = Two-Stage Compressor

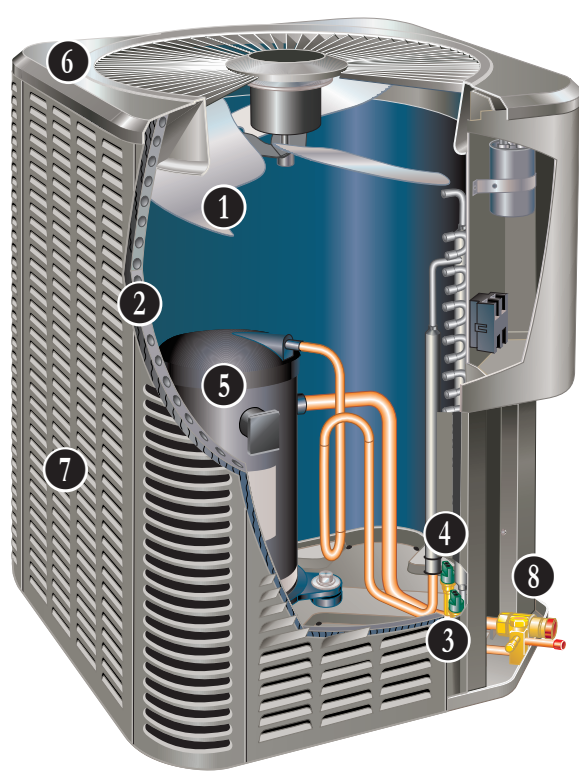
Minor Revision Level

Ratings Revision Level

Voltage
233 = 208/230V-3ph-60Hz
463 = 460V-3ph-60Hz

Nominal Cooling Capacity
036 = 3 tons
048 = 4 tons
060 = 5 tons

FEATURE HIGHLIGHTS



- 1. Outdoor Coil Fan
- 2. Quantum™ Coil
- 3. High Pressure Switch
- 4. Low Pressure Switch
- 5. Two-Stage Scroll Compressor
- 6. Heavy Gauge Steel Cabinet
- 7. Louvered Steel Panels
- 8. Refrigerant Line Connections and Access

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APPROVALS AND WARRANTY

APPROVALS

- AHRI Standard 210/240-2023 certified
- AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com
- Sound rated to AHRI Standard 270-2008 test conditions
- Tested in Lennox' Research Laboratory environmental test room
- Rated According to U.S. Department of Energy (DOE) test procedures
- Unit and components ETL, NEC and CEC bonded for grounding to meet safety standards for servicing
- ETL certified (U.S. and Canada)
- ISO 9001 Registered Manufacturing Quality System

WARRANTY

- Compressor - Limited five years
- All other covered components - Limited one year

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

FEATURES

APPLICATIONS

- 3 through 5 ton
- 208/230V or 460V-3ph models
- Sound levels as low as 76 dBA
- Applicable to indoor air handlers or gas furnaces with indoor add-on coils
- Shipped completely factory assembled, piped and wired

NOTE - Installer must set outdoor unit, connect refrigerant lines and make electrical connections to complete job.

REFRIGERATION SYSTEM

R-410A Refrigerant

- Non-chlorine, ozone friendly
- Unit is factory pre-charged

1 Outdoor Coil Fan

- Direct drive fan
- Vertical air discharge
- Sleeve bearings
- Inherently protected
- Totally enclosed fan motor
- ECM motor (060 model)
- Louvered steel top fan guard

2 Quantum™ Coil

- Enhanced aluminum alloy tube/enhanced fin coil
- Superior corrosion resistance
- Lennox designed and fabricated coil
- Ripple-edged aluminum fins
- Aluminum tube construction
- Lanced fins for maximum fin surface exposure
- Fin collars grip tubing for maximum contact area

- Flared shoulder tubing connections
- Factory tested under high pressure
- Entire coil is accessible for cleaning

3 High Pressure Switch

- Protects the system from high pressure conditions
- Automatic reset

4 Low Pressure Switch

- Shuts off unit if suction pressure falls below setting
- Provides loss of charge and freeze-up protection
- Automatic reset

Hi-Capacity Liquid Line Drier

- Furnished for field installation.
- Approved for use with R-410A systems
- Traps any moisture or dirt that could contaminate the system

Optional Accessories

Expansion Valve Kits

- Field installed on certain indoor units
- See TXV Usage table
- Chatleff style fitting

Loss of Charge Switch Kit

- Protects compressor from damage from low refrigerant charge conditions
- SPST, normally-closed
- Automatic reset

Refrigerant Line Kits

- Refrigerant lines are shipped refrigeration clean
- Lines are cleaned, dried, pressurized and sealed at factory
- Suction line fully insulated
- Lines are stubbed at both ends

FEATURES

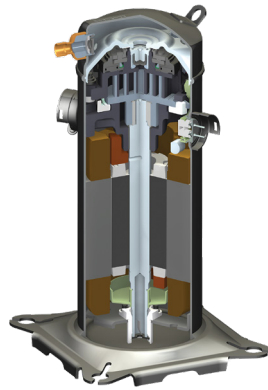
COMPRESSOR

5 Two-Stage Scroll Compressor

- High volumetric efficiency
- Uniform suction flow
- Constant discharge flow
- Quiet operation

Compressor Operation

- Two involute spiral scrolls matched together generate a series of crescent shaped gas pockets between them
- During compression, one scroll remains stationary while the other scroll orbits around it
- Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates
- As the spiral movement continues, gas pockets are pushed to the center of the scrolls
- Volume between the pockets is simultaneously reduced
- When the pocket reaches the center, gas is now at high pressure and is forced out of a port located in the center of the fixed scrolls
- During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle
- Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency
- Compressor is tolerant to the effects of slugging and contaminants
- If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged
- During the compression process, there are several pockets in the scroll that are compressing gas
- Modulation is achieved by venting a portion of the gas in the first suction pocket back to the low side of the compressor thereby reducing the effective displacement of the compressor
- A 24-volt DC solenoid valve inside the compressor controls staging
- When the 3-way solenoid is energized it moves the lift ring assembly to block the ports and the compressor operates at full-load or 100% capacity
- When the solenoid is de-energized the lift ring assembly moves to unblock the compressor ports and the compressor operates at part-load or approximately 67% of its full-load capacity
- The "loading" and "unloading" of the two stage scroll is done "on the fly" without shutting off the single-speed compressor motor between stages
- Low gas pulses during compression reduces operational sound levels



- Compressor motor is internally protected from excessive current and temperature
- Compressor is installed in the unit on specially formulated, resilient rubber mounts for better sound dampening and vibration free operation

Compressor Crankcase Heater (048-060 models)

- Prevents liquid refrigerant migration into compressor and ensures proper compressor lubrication

Optional Accessories

Compressor Crankcase Heater (036 model)

- Prevents liquid refrigerant migration into compressor and ensures proper compressor lubrication

Compressor Low Ambient Cut-Off

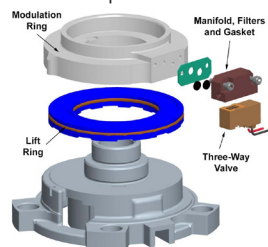
- Non-adjustable switch (low ambient cut-out)
- Prevents compressor operation when outdoor temperature is below 35°F

Compressor Sound Cover

- A reinforced vinyl compressor cover containing a 1-1/2 inch thick batt of fiberglass insulation
- All open edges are sealed with a one-inch wide hook and loop fastening tape

Compressor Time-Off Control

- Kit prevents compressor short-cycling and allows time for suction and discharge pressure to equalize.
- Permits compressor start-up in an unloaded condition.
- Automatic reset with 5 minute delay between compressor shut-off and start-up



FEATURES

CONTROLS

Optional Accessories

Indoor Blower Off Delay Relay

- Delays the indoor blower-off time during the cooling cycle

Indoor Blower Speed Relay

- Relay kit provides the option of changing blower speeds on standard permanent split capacitor (PSC) multi-tap blower motors during cooling operation
- Provides optimum humidity control conditions by automatically reducing indoor blower speed during continuous fan operation or low stage compressor operation to reduce humidity levels

Low Ambient Kit

- Air conditioners can operate down to 45°F outdoor air temperature without additional controls
- Two low ambient control options are available for field installation:
 1. Low Ambient Control Kit (30°F)
 2. Low Ambient Control (0°F)
Requires Speed Control and Weatherproof Kit (ordered separately). Available for 208/230V models only.

NOTE - Freezestat should be installed on compressors equipped with a low ambient kit.

Freezestat

- Installs on or near the suction line of the indoor coil or on the suction line
- Senses suction line temperature and cycles the compressor off when suction line temperature falls below its setpoint
- Opens at 29°F and closes at 58°F

Thermostats

- For thermostat options, see Optional Conventional Temperature Control Systems on Page 9

CABINET

- 6 • Heavy-gauge steel construction
- Pre-painted cabinet finish
- 7 • Louvered heavy gauge steel panels surround unit on all four sides
- Control box is conveniently located with all controls factory wired
- Corner patch plate allows access to compressor components
- Drainage holes are provided in base section for moisture removal
- High density polyethylene unit support feet raise the unit off of the mounting surface, away from damaging moisture

PermaGuard™ Unit Base

- Durable zinc-coated base section resists rust and corrosion

8 Refrigerant Line Connections, Electrical Inlets and Service Valves

- Sweat connection suction and liquid lines
- Located on corner of unit cabinet
- Suction valve can be fully shut off, while liquid valve may be front seated to manage refrigerant charge while servicing system
- Refrigerant line connections and field wiring inlets are located in one central area of the cabinet
- See dimension drawing

Optional Accessories

Unit Stand-Off Kit

- Black high density polyethylene feet are available to raise unit off of mounting surface away from damaging moisture
- Four feet are furnished per order number

SPECIFICATIONS

Model - 208/230V-3ph			ML18XC2-036-233	ML18XC2-048-233	ML18XC2-060-233
Model - 460V-3ph			ML18XC2-036-463	ML18XC2-048-463	ML18XC2-060-463
Nominal Tonnage			3	4	5
Sound Rating Number			76	77	76
Connections (sweat)	Liquid line (OD) - in.		3/8	3/8	3/8
	Suction line (OD) - in.		7/8	7/8	1-1/8
Compressor Type			Two-Stage Scroll	Two-Stage Scroll	Two-Stage Scroll
Refrigerant			¹ R-410A charge furnished	8 lbs. 0 oz.	11 lbs.1 oz.
Indoor Unit Expansion Valve (TXV)			12J19	12J20	12J20
Outdoor Coil	Net face area - ft. ²	Outer coil	18.67	22.17	29.09
		Inner coil	17.96	21.23	27.87
	Tube diameter - in.		5/16	5/16	5/16
	Rows		2	2	2
	Fins per in.		22	22	22
	Fan Motor	HP		1/6	1/4
Diameter - in.		22	26	26	
Blades		3	3	3	
Cfm		3160	4100	3900	
Rpm		825	825	825	
Watts		190	275	190	
Shipping Data - lbs.			187	231	283

ELECTRICAL DATA

Line voltage data - 60 Hz - 3ph		208/230V	460V	208/230V	460V	208/230V	460V
² Maximum Overcurrent Protection (MOCP) amps		20	15	30	15	40	15
³ Minimum circuit ampacity (MCA)		13.6	6.5	17.6	9.9	23.4	11.5
Compressor	Rated load amps	10.1	4.7	12.9	7.1	16.7	7.1
	Locked rotor amps	88	44.3	105	62	110	54.7
	Power factor	0.94	0.94	0.93	0.93	0.92	0.92
Outdoor Fan Motor	Full load amps	1	0.6	1.4	1.1	2.6	2.6
	Locked Rotor amps	1.9	1.1	3.2	2.5	---	---

OPTIONAL ACCESSORIES - ORDER SEPARATELY

Compressor Low Ambient Cut-Off		45F08	•	•	•
Compressor Crankcase Heater		93M04	•		
Compressor Sound Cover		18J42	•	•	•
Compressor Time-Off Control		47J27	•	•	•
Freezestat	3/8 in. tubing	93G35	•	•	•
	5/8 in. tubing	50A93	•	•	•
Indoor Blower Off Delay Relay		58M81	•	•	•
Indoor Blower Speed Relay Kit		40K58	•	•	•
Loss of Charge Switch Kit		84M23	•	•	•
⁴ Low Ambient Kit (Fan Cycling) (30°F)		34M72	•	•	•
⁴ Low Ambient Control (0°F)	Speed Control	X5867	•	---	•
	Weatherproof Kit	56N41	•	---	•
208/230V only					
Refrigerant Line Sets	3/8 x 7/8 3/8 30 ft.	89J60	•	•	
	3/8 x 7/8 3/8 40 ft.	89J61			
Liquid x Suction OD		3/8 x 7/8 3/8 50 ft.	89J62		
Insulation Thickness Length	3/8 x 1-1/8 3/8 30 ft.	X0570			•
	3/8 x 1-1/8 3/8 50 ft.	73P91			
Unit Stand-Off Kit		94J45	•	•	•

NOTE - Extremes of operating range are plus 10% and minus 5% of line voltage.

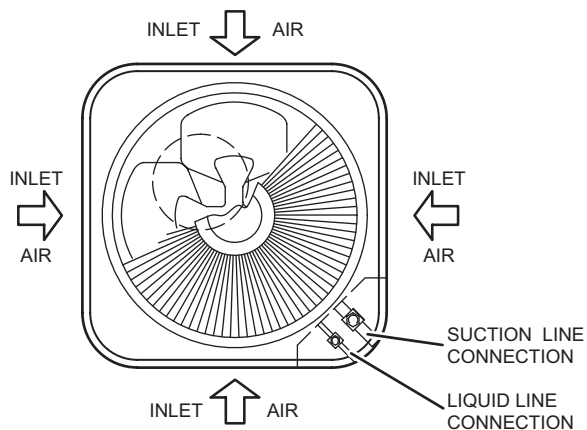
¹ Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the Installation Instructions for information about line set length and additional refrigerant charge required.

² HACR type breaker or fuse.

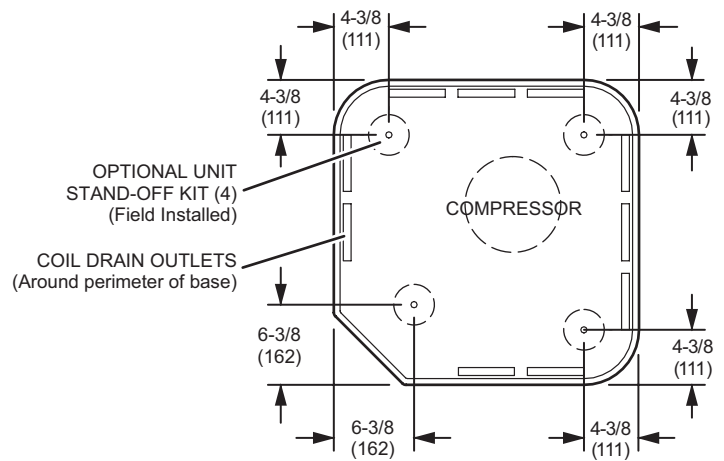
³ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

⁴ Freezestat is recommended with Low Ambient Control.

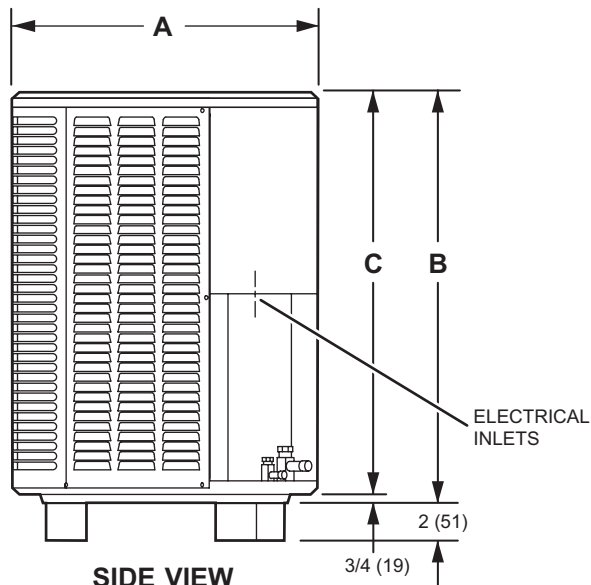
DIMENSIONS - UNIT



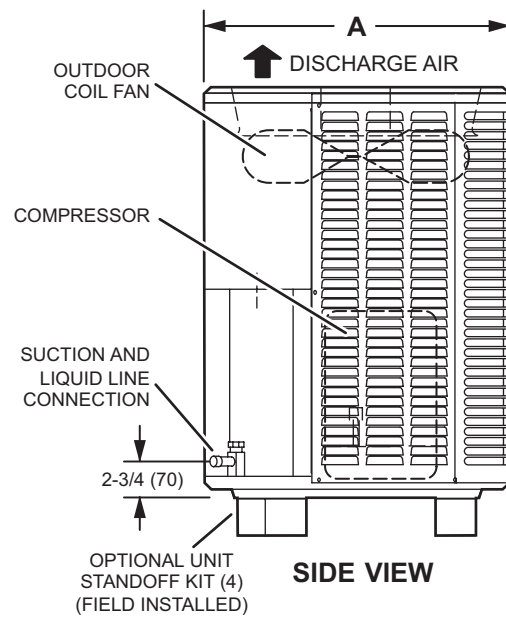
TOP VIEW



TOP VIEW BASE SECTION



SIDE VIEW



SIDE VIEW

Model	A		B		C	
	inches	mm	inches	mm	inches	mm
ML18XC2-036	28-1/4	718	33-3/4	857	33	838
ML18XC2-048	32-1/4	718	33-3/4	857	33	838
ML18XC2-060	32-1/4	819	43-1/4	1099	42-1/4	1073

EXPANDED SOUND DATA

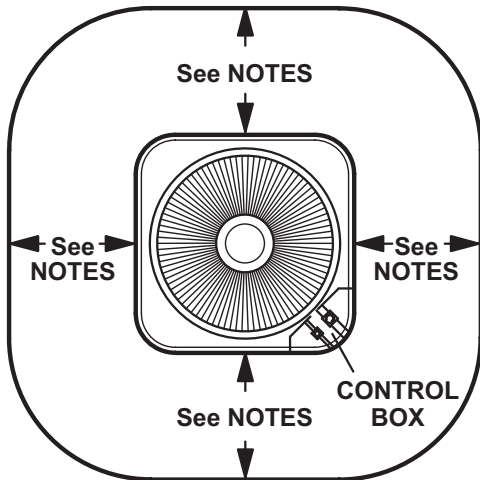
¹ Model	Octave Band Sound Power Levels dBA, re 10 ⁻¹² Watts Center Frequency - HZ							¹ Sound Rating Number (dBA)	² Estimated Sound Pressure Level at Distance From Unit (dBA at distance in ft.)				
	125	250	500	1000	2000	4000	8000		3	5	10	15	50
036	57.1	63.6	68.9	73.0	63.1	58.6	53.7	76	68	64	58	55	44
048	59.7	66.9	72.4	73.0	68.3	62.1	55.3	77	69	65	59	56	45
060	57.8	64.0	70.4	71.7	66.7	63.1	55.5	76	68	64	58	55	44

NOTE - the octave sound power data does not include tonal correction.

¹ Tested according to AHRI Standard 270-2008 test conditions.

² Estimated sound pressure level at distance based on AHRI Standard 275-2010 method for equipment located on the ground, roof, or on side of building wall with no adjacent reflective surface within 9.8 feet. Sound pressure levels will increase based on changes to assumptions. For other applications, refer to AHRI Standard 275.

INSTALLATION CLEARANCES



NOTES:

Service clearance of 30 in. (762 mm) must be maintained on one of the sides adjacent to the control box.

Clearance to one of the other three sides must be 36 in. (914 mm)

Clearance to one of the remaining two sides may be 12 in. (305 mm) and the final side may be 6 in. (152 mm).

A clearance of 24 in. must be maintained between two units. 48 in. (1219 mm) clearance required on top of unit.

TXV USAGE

Use this table for C35 and CH23 Field Installed TXV Match-Ups

Model	Order Number
ML18XC2-036	12J19
ML18XC2-048	12J20
ML18XC2-060	12J20

CX35 and CHX35 and CRX35 coils and all Lennox air handlers are shipped with a factory installed TXV. In most cases, no change out of the valve is needed.

If a change out is required it will be listed in the "TXV SUBSTITUTIONS" table by size. The correct TXV must be ordered separately and field installed.

C35 coils - Replace the factory installed RFC orifice with the expansion valve listed.

CH23 coils - Use the expansion valve listed.

TXV SUBSTITUTION

A general guide for replacing the factory installed TXV if the indoor unit (coil/air handler) is larger or smaller than the outdoor unit.

Size	Tons	Indoor Unit		TXV Furnished	TXV Replacement
		Size	Tons		
036	3	24	2	12J18	12J19
036	3	30	2.5	12J18	12J19
048	4	30/36	2.5/3	12J19	12J20
048	4	36	3	12J19	12J20

TXV Ranges:

12J18 - 1.5 to 2.5 ton systems - Use on 2.5 ton (030) and lower systems.

12J19 - 3 ton systems - Use down to 2 ton (024) systems.

12J20 - 3.5 to 5 ton systems - Use down to 3 ton (036) systems.

AHRI STANDARD 210/240-2023

Standard Ratings relating to cooling or heating capacities shall be net values, including the effects of circulating-fan heat, but not including supplementary electric heat. Power input used for calculating efficiency shall be the Total Power.

Standard Ratings of units which do not have indoor air-circulating fans furnished as part of the model, i.e., Coil-only System, shall be established by subtracting from the total cooling capacity 1,505 Btu/h per 1,000 SCFM, and by adding the same amount to the heating capacity for non-mobile-home, non-Space Constrained units. Total Power for both heating and cooling shall be increased by 441 W per 1,000 SCFM of indoor air circulated.

OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS

CS7500 Commercial 7-Day Programmable Thermostat



- Four-Stage Heating / Three-Stage Cooling
- Universal Multi-Stage
- Intuitive Touchscreen Interface
- Automatic Changeover between Heating and Cooling
- Full Seven-Day Programming
- Four Time Periods Per Day
- Temperature and Humidity Control
- One-Touch Away Mode
- Holiday Scheduling
- Smooth Setback Recovery (SSR)
- Performance Reports
- Notifications/Reminders
- Dehumidification Control for Split Systems and Rooftop Units
- Economizer Relay Control
- Backlit Display
- Wallplate Furnished
- FDD, ASHRAE and IECC Compliant

CS3000 Commercial 5-2 Day Programmable Thermostat



- Two-Stage Heating / Two-Stage Cooling
- Conventional Systems
- Intuitive Interface
- 5-2 Day Programming
- Program Hold
- Remote Indoor Temperature Sensing
- Smooth Setback Recovery (SSR)
- Economizer Relay Control
- Maintenance/Filter/Service Reminders
- Backlit Display
- Wallplate Furnished
- Simple Up and Down Temperature Control

CS3000 Non-Programmable Thermostat



- One-Stage Heating / Cooling
- Conventional Systems
- Intuitive Interface
- Manual Changeover
- Backlit Display
- Simple Up and Down Temperature Control

OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS

Description	Catalog No.
CS7500 Commercial 7-Day Programmable Thermostat	
CS7500 7-Day Thermostat	24K41
Sensors/Accessories	² Remote non-adjustable wall-mount 20k 47W36
	² Remote non-adjustable wall-mount 10k 47W37
	Remote non-adjustable discharge air (duct mount) 19L22
	Outdoor temperature sensor X2658
CS3000 Commercial 5-2 Day Programmable Thermostat	
CS3000 5-2 Day Thermostat	11Y05
Sensors/Accessories	Remote non-adjustable wall mount 10k averaging 47W37
	Thermostat wall mounting plate X2659
CS3000 Non-Programmable Thermostat	
CS3000 Non-Programmable Thermostat	51M32
Universal Thermostat Guard with Lock (clear)	
	Inside Dimensions (H x W) 5 7/8 x 8 3/8 in. 39P21

¹ Up to nine of the same type remote temperature sensors can be connected in parallel.

² Remote wall-mount sensors can be applied in any of the following combinations:
 One Sensor - (1) 47W36, Two Sensors - (2) 47W37, Three Sensors - (2) 47W36 and (1) 47W37
 Four Sensors - (4) 47W36, Five Sensors - (3) 47W36 and (2) 47W37

REVISIONS

Sections	Description of Change
Optional Accessories	Updated voltage usage for Low Ambient Kits.



Visit us at www.Lennox.com

For the latest technical information, www.LennoxCommercial.com

Contact us at 1-800-4-LENNOX

NOTE - Due to Lennox' ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability. Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury. Installation and service must be performed by a qualified installer and servicing agency.

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