

C&I Energy Efficiency Program Guidelines

New Commercial Refrigerated Display Cases

The following is the minimum information required for energy conservation measures (ECM's) related to the installation of new low, medium or ice cream rated temperature refrigerated display cases. Projects applying for incentives related to new refrigerated cases must comply with all applicable requirements listed herein.

Required Project Documentation

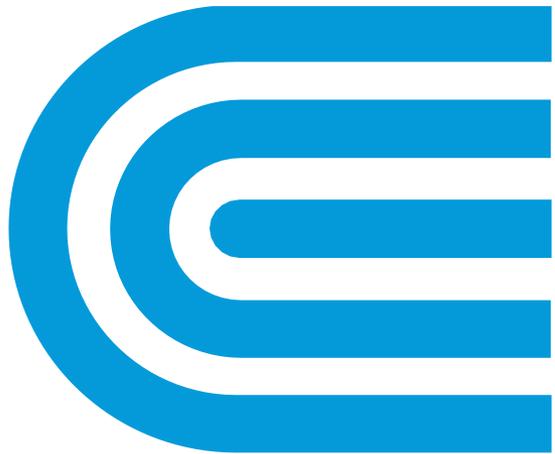
All projects must provide the following documentation.

- A. **Detailed Scope of Work:** A comprehensive description of the proposed measure, including all equipment and the existing system's operation.
- B. **Engineering Analysis of Energy Savings:** Submit an engineering analysis of the estimated energy savings using the [Con Edison - Refrigerated Display Case Tool](#). User instructions are included at the end of this document.

Required Technical Data

All incentive applications must include the following technical data:

1. **The Maximum Daily Energy Consumption (MDEC): The MDEC must be less than the Energy Use Limit specified by the applicable energy conservation code.**
2. Existing Case Quantity: Number of existing refrigerated cases being replaced.
3. Proposed Case Quantity: Number of new refrigerated cases being installed.
4. Make and Model: Manufacturer and model number of each new refrigerated case.
5. Code Compliance Data: Equipment class, family code, operating mode, and rating temperature, as specified in the relevant energy conservation code (e.g., New York State Energy Conservation Code). **See the sample table below.**
6. Individual MDEC: Maximum Daily Energy Consumption of each refrigerated case (MDEC) in kWh.
7. Manufacturing Year: Year of manufacture for each new case.
8. Voltage: Voltage of each new refrigerated case.
9. Canopy Light Quantity: Quantity of each canopy light.
10. Canopy Lighting: Canopy light type and wattage (e.g., EcoShine Ultra, EcoShine II).
11. Lit Shelves: Number lit shelves per unit.
12. Number of Doors or Total Display Area (ft²) – TDA
13. Total Power Rating: Total power rating in kW.
14. Fan Motor Quantity: Number of fan motors.
15. Fan Motor Specifications: Fan motor type (e.g., ECM, PSC) and kW rating.
16. Operating/Burn Hours: Operating hours or burn hours of lights at location.
17. Defrost Schedule: Scheduled frequency and duration of defrost.
18. Drain Heater Watts (if applicable): Drain heater wattage.
19. Defrost Heater Watts (if applicable): Defrost heater wattage.
20. Anti-Sweat Watts (if applicable): Anti-sweat wattage.



conEdison

*Display Case
Refrigeration Tool*

C&I, SMB Programs

User Guide

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Background

The Con Edison Display Case Refrigeration Tool is an excel based tool that calculates energy savings from the installation of high efficiency refrigerated display cases over standard code compliant units. It may be used to calculate energy savings and incentives for projects processed through the **Con Edison Small Business and Commercial & Industrial Energy Efficiency Programs**.

The Tool uses the **2020 ECCCNYC: 2020 Conservation Construction Code of New York as the baseline** with which proposed energy consumption is compared against.

All installed cases must meet local codes and standards to be eligible for program incentives. As an example, refrigerated cases installed in locations in New York City must meet the NYCECC 2020: New York City Energy Conservation Code 2020 to be eligible for incentives. **The Display Case Refrigeration Tool does not verify program eligibility.**

References:

<https://dos.ny.gov/system/files/documents/2020/09/2020-ecccnys-november-2019.pdf>

https://www.nyc.gov/assets/buildings/apps/pdf_viewer/viewer.html?file=2020ECC_CHC4.pdf§ion=energy_code_2020

Project Summary

- Calculation tool adheres to the latest Energy Conservation Construction Code of New York State.
- Select the applicable program (C&I or Small Biz) from the dropdown menu.
- Incentive rate automatically calculates based on program selection.

The screenshot displays the 'Data Input Tool' interface for conEdison. It is divided into several sections: Project Details, Account Holder Information, Site Information, and Participating Contractor Information. The Project Details section includes fields for Baseline ECC (ECCCNYS), Baseline Reference (ECCCNYS 2020: Energy Conservation Construction Code of New York State), and Program (C&I). The Account Holder Information section includes fields for Account Name, Account Number (14 Digits), Title, Mailing Address, Unit Number, City, and Zip. The Site Information section includes fields for Contact First Name, Contact Last Name, Street Address, Unit Number, City, Zip, Phone, and Email. The Participating Contractor Information section includes fields for Company Name, Contact Name, Title, Mailing Address, Phone, and Email. A 'Project Totals' table is located on the right side of the form, showing Line Item Count (n=) as 46, Energy Savings (kW) as 67.92, Annual Energy Savings (kWh) as 595,011.11, and Incentive (\$) as \$113,052.11. A callout box labeled 'Calculated Incentive' points to the Incentive (\$) value in the Project Totals table. A red oval highlights the Program dropdown menu, which is currently set to C&I. A red arrow points from the Program dropdown menu to the Project Details section, and another red arrow points from the Project Details section to the Project Totals table. A red oval also highlights the Project Details section, with the text 'Project Details' and 'ECCCNYS' visible. The text '* indicates a required field' is present in the top right corner of the form.

Project Details	
Baseline ECC	ECCCNYS
Baseline Reference	ECCCNYS 2020: Energy Conservation Construction Code of New York State
*Program	C&I

Account Holder Information	
Account Name*	
Account Number (14 Digits)*	
Title*	
Mailing Address*	
Unit Number	
City*	
Zip*	

Site Information	
Contact First Name*	
Contact Last Name*	
Street Address*	
Unit Number	
City*	
Zip*	
Phone*	
Email*	

Participating Contractor Information	
Company Name*	
Contact Name*	
Title*	
Mailing Address*	
Phone*	
Email*	

Project Totals	
Line Item Count (n=)	46
Energy Savings (kW)	67.92
Annual Energy Savings (kWh)	595,011.11
Incentive (\$)	\$113,052.11

User Inputs – Categories

For this calculation tool, user inputs fall into four key categories:

1. Equipment Overview: Make & Model Information

2. Total Project Costs: Labor and Materials

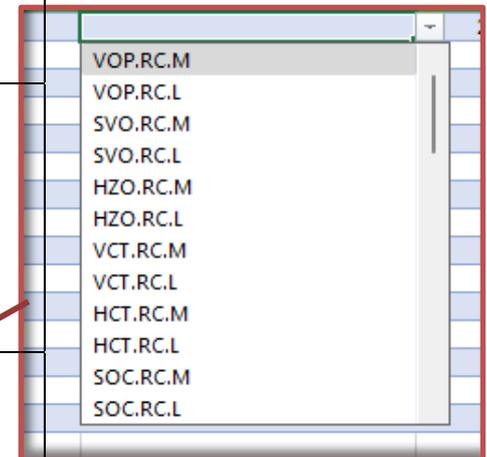
3. Temperature Settings: Contents & Purpose

4. Operational Guidelines: Hours of Operation and Defrost Schedules

User Inputs – 1. Equipment Overview

Proposed Refrigeration Cases			
User Input:	Type:	Sample Input:	Sample Entry:
Line Item #	Type: Integer	2	1
Location	Type: Text	2.1 Produce	1.2 Dairy Shelf
Make	Type: Dropdown	Arneg Hillphoenix Hussman Zero Zone	Hussman
Model No.	Type: Dropdown	ESGMS-8 FG-12 IC3SL-8 ID5NL12 ID5SL8 ID6NL12 O5MH-NRG-12	ID5SL12
Equipment Class	Type: Dropdown	VOP.RC.M VOP.RC.L SVO.RC.M SVO.RC.L HZO.RC.M VCT.RC.M HCT.RC.L SOC.RC.M	VOP.RC.M

Select from Dropdown



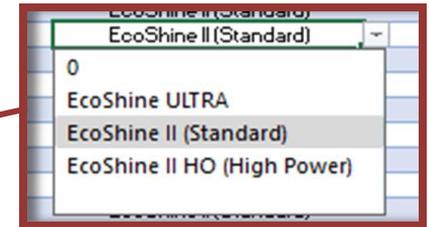
(Contd. Page 19)

User Inputs – 1. Equipment Overview cont.

2. Total Project Costs

Proposed Refrigeration Cases			
User Input:	Type:	Sample Input:	Sample Entry:
Manufacturing Year	Type: Dropdown	2020 2021 2022 2023	2023
Voltage	Type: Dropdown	115 120 220 230	120
Quantity	Type: Number	1	1
Canopy Light	Type: Number	1	1
Canopy Light Type	Type: Dropdown	0 EcoShine Ultra EcoShine II (Standard) EcoShine II HO (High Power)	EcoShine II (Standard)
Number of Lit Shelves	Type: Number	5	5
Fan Motor Type	Type: Dropdown	Shaded Pole Motor Permanent Split Capacitor (PSC) Electronically Commutated Permanent Magnet (ECPM)	Electronically Commutated Permanent Magnet (ECPM)
Labor Cost (\$)	Type: Cost (\$)	\$3,500.00	\$5,748.25
Materials Cost (\$)	Type: Cost (\$)	\$6,500.00	\$8,000.00
Total Project Cost (\$)	Type: Cost (\$)	\$10,000.00	\$13,748.25

Select from Dropdown



Display Case Refrigeration Tool

- To enter appliance details, open the 'Con Edison Display Case Refrigeration Components Tool'
- Data can be entered in the 'Refrigeration Components' Tab
- Appliance details can be viewed from the 'Appliance Database' tab

Proposed Refrigeration Cases											
Line Item #	Location	Make	Model No.	Equipment Class	Manufacturing Year	Voltage	Quantity	Canopy Light	Canopy Light Type	Number of Lit Shelves	
1	Meat - Open Case - Unit#1	Husmann	IDSSL12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	5	
2	Meat - Open Case - Unit#2	Husmann	IDSSL12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	5	
3	Meat - Open Case - Unit#3	Husmann	IDSSL12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	5	
4	Meat - Open Case - Unit#4	Husmann	IDSSL12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	5	
5	Meat - Open Case - Unit#5	Husmann	IDSSL12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	5	
6	Dairy - Open Case - Unit#7	Husmann	ID6NU8	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
7	Dairy - Open Case - Unit#8	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
8	Dairy - Open Case - Unit#9	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
9	Dairy - Open Case - Unit#10	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
10	Dairy - Open Case - Unit#12	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
11	Dairy - Open Case - Unit#13	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
12	Dairy - Open Case - Unit#14	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
13	Dairy - Open Case - Unit#15	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
14	G&G - Open Case - Unit#16	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
15	G&G - Open Case - Unit#17	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
16	G&G - Open Case - Unit#18	Husmann	ID6NU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
17	Produce - Open Case - Unit#20	Husmann	ID6SU8	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
18	Produce - Open Case - Unit#21	Husmann	ID6SU8	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
19	Dairy - Open Case - Unit#22	Husmann	ID6SU8	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
20	Dairy - Open Case - Unit#23	Husmann	ID6SU8	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
21	Dairy - Open Case - Unit#24	Husmann	ID6SU8	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
22	Produce - Open Case - Unit#25	Husmann	ID6SU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
23	Produce - Open Case - Unit#26	Husmann	ID6SU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
24	Produce - Open Case - Unit#27	Husmann	ID6SU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
25	Produce - Open Case - Unit#28	Husmann	ID6SU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
26	Produce - Open Case - Unit#29	Husmann	ID6SU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
27	Produce - Open Case - Unit#30	Husmann	ID6SU12	VOP.RC.M	2023	120	1	1	EcoShine II (Standard)	6	
28	en - Closed Transparent Case - Un	Husmann	RLTM4	VCT.RC.L	2018	120	1	1	EcoShine II (Standard)	0	
29	en - Closed Transparent Case - Un	Husmann	RLTM5	VCT.RC.L	2018	120	1	1	EcoShine II (Standard)	0	
30	en - Closed Transparent Case - Un	Husmann	RLTM5	VCT.RC.L	2018	120	1	1	EcoShine II (Standard)	0	
31	en - Closed Transparent Case - Un	Husmann	RLTM5	VCT.RC.L	2018	120	1	1	EcoShine II (Standard)	0	
32	en - Closed Transparent Case - Un	Husmann	RLTM5	VCT.RC.L	2018	120	1	1	EcoShine II (Standard)	0	

Refrigeration Components

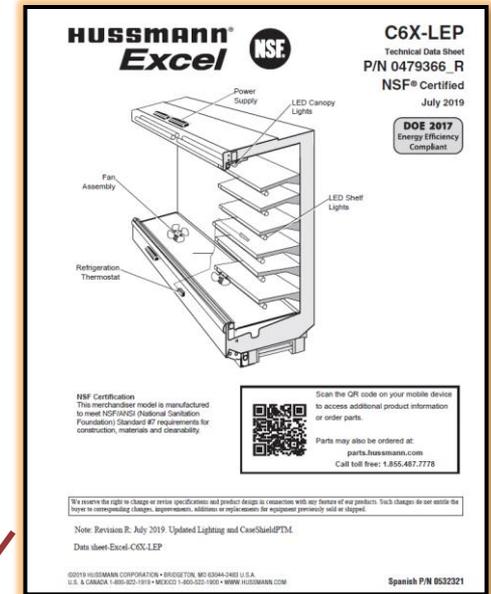
Appliance Database

Display Case Refrigeration Tool – Equipment Overview

- Existing appliance details can be found in the 'Appliance Database' tab
- Model details can be retrieved from the manufacturers technical data sheet

1-1-2024 - Con Edison Small Biz Display Case Refrigeration Components Tool 2024 Appliance Database
Version 24.0 - Updated 6-27-2024

Serial	Manufacturer	Open/Close	Manufacturing Year	Series	Model	Voltage	Open Case Length	Light Fixture Length	Open Case Length2
	Hussmann	Close	2017	Q3-DV-	Q3-DV-10	115	10	4	10.00
	Hussmann	Close	2017	Q3-DV-	Q3-DV-12	115	12	4	12.00
520	Hussmann	Open	2017	C2X-LEP-	C2X-LEP-4	120	4	4	4.03
521	Hussmann	Open	2017	C2X-LEP-	C2X-LEP-6	120	6	3	6.06
522	Hussmann	Open	2017	C2X-LEP-	C2X-LEP-8	120	8	4	8.06
523	Hussmann	Open	2017	C2X-LEP-	C2X-LEP-12	120	12	4	12.04
571	Hussmann	Open	2019	C6X-LEP	C6X-LEP4	120	4	4	4.00
572	Hussmann	Open	2019	C6X-LEP	C6X-LEP6	120	6	3	6.00
573	Hussmann	Open	2019	C6X-LEP	C6X-LEP8	120	8	4	8.00
574	Hussmann	Open	2019	C6X-LEP	C6X-LEP12	120	12	4	12.00
575	Hussmann	Open	2017	M5X-EP	M5X-EP4	120	4	4	4.00
576	Hussmann	Open	2017	M5X-EP	M5X-EP6	120	6	3	6.00
577	Hussmann	Open	2017	M5X-EP	M5X-EP8	120	8	4	8.00
578	Hussmann	Open	2017	M5X-EP	M5X-EP12	120	12	4	12.00



Proposed Refrigeration Cases

Line Item #	Location	Make	Model No.	Equipment Class	Manufacturing Year	Voltage	Quantity	Canopy Light	Canopy Light Type	Number of Lit Shelves
1	Produce- Unit#1	Hussmann	D6NX-LEP8	VOP.RC.M	2019	120	1	1	Shine II (Standard)	5
2	Produce- Unit#1	Hussmann	D6NX-LEP8	VOP.RC.M	2019	120	1	1	Shine II (Standard)	5
3										
4	Produce- Unit#3	Hussmann	C6X-LEP12							

Display Case Refrigeration Tool – Equipment Overview

- Product consumption data can be retrieved from technical data sheet per select model.
- If the appliance make and model are listed in the Appliance database, consumption data will be available.
- Custom lighting and shelving configurations may also be entered.

Excel C6X-LEP Dairy/Delicatessen/Produce								
Electrical Data								
Number of Fans—25W	4 ft 1	6 ft —	8 ft 2	12 ft 3				
Number of Fans—7W	—	4	—	—				
		Amperes				Watts		
	4 ft	6 ft	8 ft	12 ft	4 ft	6 ft	8 ft	12 ft
Evaporator Fan								
120V 50/60Hz Standard Energy Efficient	0.60	0.76	1.20	1.80	36	56	72	108
230V 50/60Hz Standard Energy Efficient	0.30	0.40	0.60	0.90	36	56	72	108
230V 60Hz Export	0.66	1.00	1.32	1.98	100	156	200	300
230V 50Hz Export	0.76	1.12	1.52	2.28	114	168	228	342
Minimum Circuit Ampacity								
120V 50/60Hz Standard Energy Efficient	0.80	0.96	1.40	2.00				
230V 50/60Hz Standard Energy Efficient	0.50	0.60	0.80	1.10				
230V 60Hz Export	0.86	1.20	1.52	2.18				
230V 50Hz Export	0.96	1.32	1.72	2.48				
Maximum Over Current Protection 120V	20	20	20	20				
Maximum Over Current Protection 230V	15	15	15	15				

	Amperes				Watts			
	4 ft	6ft	8 ft	12 ft	4 ft	6 ft	8 ft	12 ft
LED LIGHTING								
EcoShine ULTRA Canopy Lights								
1 Row EcoShine ULTRA	0.16	0.26	0.36	0.54	19	31	43	64
EcoShine II Canopy Lights								
1 Row EcoShine II	0.16	0.26	0.32	0.48	19	32	39	58
1 Row EcoShine II HO	0.22	0.33	0.44	0.66	27	40	53	79
EcoShine II Shelf Lights								
3 Rows of Shelves	0.25	0.35	0.49	0.74	30	42	59	89
4 Rows of Shelves	0.33	0.47	0.66	0.99	40	56	79	119
5 Rows of Shelves	0.41	0.59	0.82	1.24	49	71	99	148
6 Rows of Shelves	0.49	0.70	0.99	1.48	59	85	119	178
EcoShine II Rail Light — 1 Row	0.08	0.12	0.16	0.25	10	14	20	30
Standard Lighting (T-8 Fluorescent) 1 Row Canopy t								
Each Row of Canopy, Shelf or Rail Lights	0.26	0.51	0.51	0.77	30	59	59	85

Proposed Refrigeration Cases										
	User Input	User Input	User Input	User Input	User Input	User Input	User Input	User Input	User Input	User Input
Line Item #	Location	Make	Model No.	Equipment Class	Manufacturing Year	Voltage	Quantity	Canopy Light	Canopy Light Type	Number of Lit Shelves
1	Produce- Unit#1	Husmann	D6NX-LEP8	VOP.RC.M	2019	120	1	1	EcoShine II (Standard)	5
2	Produce- Unit#1	Husmann	D6NX-LEP8	VOP.RC.M	2019	120	1	1	EcoShine II (Standard)	5
3										
4	Produce- Unit#3	Husmann	C6X-LEP12	VOP.RC.M	2019	120	1	1	EcoShine II (Standard)	5

Display Case Refrigeration Tool – Total Project Costs

Project costs must be entered to validate the incentive amount.

- **Labor Costs (\$)** : Total labor costs for the project can be entered as a user input.
- **Materials Cost (\$)** : Total material costs for the project can be entered as a user input.
- **Total Project Cost (\$)** : The Total Project Cost is automatically calculated using the formula: Labor Costs + Materials Cost.

Q	R	S
User Input	User Input	
Labor Cost (\$)	Materials Cost (\$)	Total Project Cost (\$)
\$400.00	\$500.00	\$900.00
\$3,400.00	\$5,000.00	\$8,400.00
\$2,200.00	\$4,300.00	\$6,500.00

Display Case Refrigeration Tool – Temperature Settings

- Energy Calculations - Compressor:
 - Evaporator Temperature (F): from - technical data sheet

Multi-deck, 6 Display Levels, Low Front

DOE 2017 Energy Efficient Compliant Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

Dimensions shown as in. and (mm).

Excel C6X-LEP Dairy/Delicatessen/Produce

REFRIGERATION DATA

Note: This data is based on store temperature and humidity that does not exceed 75°F and 55% R.H.

C6X-LEP [§]	DAIRY/DELI/PRODUCE†	UNLIT	LIT
Discharge Air (°F)		33	31
Evaporator (°F)		28	26
Unit Sizing (°F)		26	24

†For red meat application, lower evaporator temperature and unit sizing 3°F. Increase Btu 5%.

§ Average evaporator temperature shown. Use dew point for high glide refrigerants for unit sizing. Care should be taken to use the dew point in PT tables for measuring and adjusting superheat. Adjust evaporator pressure as needed to maintain discharge air temperature shown.

¶For red meat application, lower evaporator temperature and unit sizing 3°F. Increase Btu 5%.

§ Average evaporator temperature shown. Use dew point for high glide refrigerants for unit sizing. Care should be taken to use the dew point in PT tables for measuring and adjusting superheat. Adjust evaporator pressure as needed to maintain discharge air temperature shown.

Btu/h/ft² — Unit Shelves †

C6X-LEP	DAIRY/DELI/PRODUCE	6 ft
PARALLEL		1413
CONVENTIONAL		1473

† Add 10 Btu/h/ft per shelf row for LED fixture. Add 20 Btu/h/ft per shelf row for fluorescent lamps. Reduce refrigeration load by 15% if fitted with CaseShieldPIM.

DEFROST DATA

Frequency Hrs	C6X-LEP
Defrost Water (lb/ft/day)	10.5 (± 15% based on case configuration and product loading).

OFFTIME C6X-LEP 30

ELECTRIC OR GAS Not Recommended

CONVENTIONAL CONTROLS

Low Pressure Backup Control
CU/CO*

C6X-LEP	DAIRY/DELI/PRODUCE†	19°F / 9°F
Temp (°F)		48°F

Indoor Unit Only, Pressure Defrost Termination* 48°F

*Use a Temperature Pressure Chart to determine PSIG conversions.
†For red meat application, reduce low pressure backup control by 3°F.

Estimated Charge **

C6X-LEP	4 ft	6 ft	8 ft	12 ft
1.9 lb	30 oz	42 oz	59 oz	82 oz
0.9 kg	1.2 kg	1.7 kg	2.3 kg	

**This is an average for all refrigerant types. Actual refrigerant charge may vary by approximately half a pound (8 oz/0.2 kg).

REFRIGERATION DATA

Note: This data is based on store temperature and humidity that does not exceed 75°F and 55% R.H.

C6X-LEP[§] DAIRY/DELI/PRODUCE†

	UNLIT	LIT
Discharge Air (°F)	33	31
Evaporator (°F)	28	26
Unit Sizing (°F)	26	24

†For red meat application, lower evaporator temperature and unit sizing 3°F. Increase Btu 5%.

§ Average evaporator temperature shown. Use dew point for high glide refrigerants for unit sizing. Care should be taken to use the dew point in PT tables for measuring and adjusting superheat. Adjust evaporator pressure as needed to maintain discharge air temperature shown.

Energy Calculations - Compressor

User Input	User Input	User Input	User Input
Evaporator Temperature (F)	Unit Capacity (Btu/h per ft or door)	# of Defrosts/Day	Defrost Duration (Hrs)
26	1,540	2	0.50
26	1,540	2	0.50
26	1,474	2	0.50
Compressor Working Time (Hrs/day)			
23.00			23.00

Display Case Refrigeration Tool – Temperature Settings

- Energy Calculations - Compressor:
 - Unit Capacity (Btu/hr/ft):** from - technical data sheet
 - Base Capacity: 1424 Btu/hr/ft (C6X-LEP, Parallel, 12ft)
 - Lighted Shelf Addition: +10 Btu/h/ft per shelf
 - Total Capacity = Base Capacity + (Lighted Shelf Addition x Number of Shelves)

Btu/hr/ft — Unlit Shelves ‡

C6X-LEP	Dairy/Deli/Produce
4 ft/8 ft/12 ft	6 ft
PARALLEL	1424
CONVENTIONAL	1484

‡ Add 10 Btu/hr/ft per shelf row for LED fixtures. Add 20 Btu/hr/ft per shelf row for fluorescent lamps. Reduce refrigeration load by 15% if fitted with CaseShieldPTM.

User Input

Number of Lit Shelves

5

5

5

Energy Calculations - Compressor				
User Input	User Input	User Input	User Input	
Evaporator Temperature (F)	Unit Capacity (Btu/h per ft or door)	# of Defrosts/Day	Defrost Duration (Hrs)	Compressor Working Time (Hrs/day)
26	1,540	2	0.50	23.00
26	1,540	2	0.50	23.00
26	1,474	2	0.50	23.00

• **Unit Capacity** = 1424 + (10 x 5) = 1474 Btu/hr/ft

Display Case Refrigeration Tool – Temperature Settings

- Energy Calculations - Compressor:

DEFROST DATA

C6X-LEP

Frequency Hrs 12

Defrost Water (lb/ft/day) 10.5
 (± 15% based on case configuration and product loading).

OFFTIME **C6X-LEP**

TIME (minutes) 30

ELECTRIC OR GAS Not Recommended

Energy Calculations - Compressor				
User Input	User Input	User Input	User Input	
Evaporator Temperature (F)	Unit Capacity (Btu/h per ft or door)	# of Defrosts/Day	Defrost Duration (Hrs)	Compressor Working Time (Hrs/day)
26	1,540	2	0.50	23.00
26	1,540	2	0.50	23.00
26	1,474	2	0.50	23.00

- Number of Defrosts/Day:** from - technical data sheet
 - Number of Defrosts per Day = 24 hours/day / 12 hours/defrost = 2 defrosts/day

- Defrost Duration:** from - technical data sheet
 - Hours = 30 minutes / 60 ; Hours = 0.5 hours

Display Case Refrigeration Tool – Operational Guidelines

- Energy Calculations - Load
- *Example #1 – Produce (Medium Temperature)*
 - **Burn Hours of Lights (Hrs/Day):** (typically based on operating hours)
 - Store Hours: 6:00am-9:00pm = 15 Hours
 - **Heaters:**
 - **Drain Heaters (W):** - technical data sheet
 - **Defrost Heaters (W):** - technical data sheet

* Note: Defrost consumption is 0 if defrosts occur during off-time

Energy Calculations - Load					
User Input	User Input	User Input	User Input	User Input	
Burn Hours of Lights (Hrs/Day)	Drain Heaters (W)	Defrost Heater (W)	Condensate Pan+Condensate Pump (W)	Anti-Sweat (W)	
15	0	0	0	0	
15	0	0	0	0	
15	0	0	0	0	

DEFROST DATA	
	C6X-LEP
Frequency Hrs	12
Defrost Water (lb/ft/day)	10.5
(± 15% based on case configuration and product loading).	
	C6X-LEP
OFFTIME TIME (minutes)	30
ELECTRIC OR GAS	Not Recommended

- **Other Loads:**
 - **Condensate Pan + Pump (W):** - technical data sheet
 - **Anti-Sweat (W):** - technical data sheet

Display Case Refrigeration Tool – Operational Guidelines

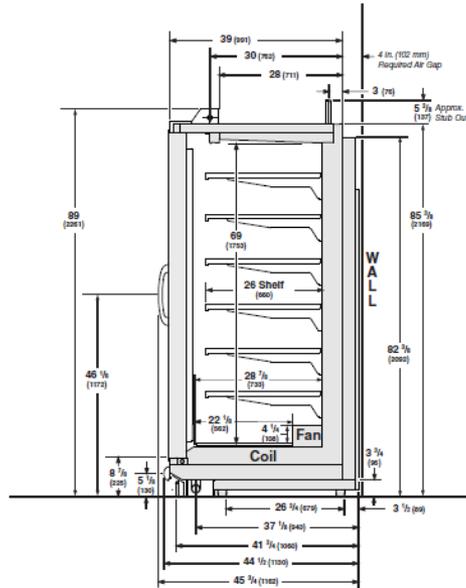
Tall Reach-in 2, 3, 4 and 5 Door Models



Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

Refrigeration and electrical connections are on top. Overhead piping and electrical circuits are required.

Dimensions shown as inches & (mm).



Estimated Charge ***	RLTM
2 Dr	2.3 lb 37 oz 1.0 kg
3 Dr	3.2 lb 51 oz 1.4 kg
4 Dr	4.1 lb 66 oz 1.8 kg
5 Dr	5.1 lb 82 oz 2.3 kg

***This is an average for all refrigerant types. Actual refrigerant charge may vary by approximately half a pound (8 oz / 0.2 kg).

NSF Certification
This merchandiser model is manufactured to meet NSF/ANSI (National Sanitation Foundation) Standard #7 requirements for construction, materials & cleanliness.

RLTM With Innovator Doors Low Temperature

REFRIGERATION DATA§

Note: This data is based on store temperature and humidity that does not exceed 75°F and 55% R.H.

	FF	IC	AHRI Rating*
Discharge Air (°F)	-5	-12	-2
Evaporator (°F)	-9	-17	-7
Unit Sizing (°F)	-12	-20	-10

*With door A/S controller.

BrulhrDoor*

INNOVATOR			
Parallel	1055	1150	950
Conventional	1070	1170	980

INNOVATOR III			
Parallel	1045	1140	950
Conventional	1060	1160	980

§ A... point for high glide refrigerants for unit sizing. Care should be taken to use the dew point in PT tables for measuring and adjusting superheat. Adjust evaporator pressure as needed to maintain discharge air temperature shown.

DEFROST DATA

	FF	IC
Frequency (hr)	24	24
Defrost Water (lb/Dr/day)	1.2	1.3

(± 15% based on case configuration and product loading.)

ELECTRIC		
Temp Term (°F)	FF	IC
	48°	48°

GAS		
Duration (minutes)	FF	IC
	50	50

OFFTIME Not Recommended

CONVENTIONAL CONTROLS

Low Pressure Backup Control

	FF	IC
Ch/CO (Temp °F)**	-18°/-34°	-26°/-45°

Indoor Unit Only, Pressure Defrost Termination (Temp °F)**

Not Recommended

**Use a Temperature Pressure Chart to determine PSIG conversions.

REFRIGERATION DATA§

Note: This data is based on store temperature and humidity that does not exceed 75°F and 55% R.H.

	FF	IC	AHRI Rating*
Discharge Air (°F)	-5	-12	-2
Evaporator (°F)	-9	-17	-7
Unit Sizing (°F)	-12	-20	-10

*With door A/S controller.

BrulhrDoor*

INNOVATOR			
Parallel	1055	1150	950
Conventional	1070	1170	980

INNOVATOR III			
Parallel	1045	1140	950
Conventional	1060	1160	980

DEFROST DATA

	FF	IC
Frequency (hr)	24	24
Defrost Water (lb/Dr/day)	1.2	1.3

(± 15% based on case configuration and product loading.)

ELECTRIC		
Temp Term (°F)	FF	IC
	48°	48°

GAS		
Duration (minutes)	FF	IC
	50	50

OFFTIME Not Recommended

Display Case Refrigeration Tool – Operational Guidelines

- Energy Calculations - Load
- *Example #2 – Frozen Foods (Low Temperature)*
 - **Drain Heater Watts** : 300 (5 Door)
 - **Defrost Heater Watts**: 3500 (5 Door)

REFRIGERATION DATA§
 Note: This data is based on store temperature and humidity that does not exceed 75°F and 55% R.H.

	FF	IC	AHRI
Discharge Air (°F)	-5	-12	-2
Evaporator (°F)	-9	-17	-7
Unit Sizing (°F)	-12	-20	-10
*With door A/S controller.			
<i>Brulhr/Door*</i>			
INNOVATOR			
Parallel	1055	1150	950
Conventional	1070		
INNOVATOR III			
Parallel	1045		
Conventional	1060		

Energy Calculations - Compressor					Energy Calculations - Load				
User Input	User Input	User Input	User Input		User Input	User Input	User Input	User Input	User Input
Evaporator Temperature (F)	Unit Capacity (Btu/h per ft or door)	# of Defrosts/Day	Defrost Duration (Hrs)	Compressor Working Time (Hrs/day)	Burn Hours of Lights (Hrs/Day)	Drain Heaters (W)	Defrost Heater (W)	Condensate Pan+Condensate Pump (W)	Anti-Sweat (W)
-9	1,055	1	0.83	23.17	15	300	3500		694
-9	1,055	1	0.83	23.17	15	300	3500		694
-9	1,055	1	0.83	23.17	15	300	3500		694
-9	1,055	1	0.83	23.17	15	300	3500		694

Defrost								Watts			
Drain Heaters (Koolgas or Electric)								2Dr	3Dr	4Dr	5Dr
120V	50/60Hz	Standard	0.63	1.25	2.0	2.57	75	150	240	300	
220V	50/60Hz	Export	0.34	0.76	1.22	1.53	75	150	240	300	
Electric Defrost Heater											
208V	50/60Hz	Standard	6.72	10.08	13.46	16.82	1400	2100	2800	3500	
220V	50/60Hz	Export	7.11	10.66	14.24	17.79	1564	2345	3133	3914	

Energy Conservation Code

Equipment Class: The Energy Conservation Code categorizes display cases based on their equipment Class. (e.g., VOP.RC.M)

Family Code (Display Case Design): This describes the physical design of the display case (e.g., Vertical open, Horizontal open, with doors).

Operating Mode (Remote Condensing / Self-Contained): This indicates whether the refrigeration system is located remotely or is integrated within the display case.

Rating Temperature (Medium/Low/Ice-cream): This specifies the temperature range the display case is designed to maintain.
Example: Medium. The spec sheet specifies usage for "Dairy/Delicatessen/Produce," which falls under medium temperature applications.

TABLE C403.10.1(2)
COMMERCIAL REFRIGERATION – MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE				ENERGY USE LIMITS (kWh/day) ^{a,b}	TEST PROCEDURE
Equipment Class ^c	Family Code	Operating Mode	Rating Temperature		
VOP.RC.M	Vertical open	Remote condensing	Medium	$0.82 \times TDA + 4.07$	AHRI 1200
SVO.RC.M	Semivertical open	Remote condensing	Medium	$0.83 \times TDA + 3.18$	
HZO.RC.M	Horizontal open	Remote condensing	Medium	$0.35 \times TDA + 2.88$	
VOP.RC.L	Vertical open	Remote condensing	Low	$2.27 \times TDA + 6.85$	
HZO.RC.L	Horizontal open	Remote condensing	Low	$0.57 \times TDA + 6.88$	
VCT.RC.M	Vertical transparent door	Remote condensing	Medium	$0.22 \times TDA + 1.95$	
VCT.RC.L	Vertical transparent door	Remote condensing	Low	$0.56 \times TDA + 2.61$	
SOC.RC.M	Service over counter	Remote condensing	Medium	$0.51 \times TDA + 0.11$	
VOP.SC.M	Vertical open	Self-contained	Medium	$1.74 \times TDA + 4.71$	
SVO.SC.M	Semivertical open	Self-contained	Medium	$1.73 \times TDA + 4.59$	
HZO.SC.M	Horizontal open	Self-contained	Medium	$0.77 \times TDA + 5.55$	
HZO.SC.L	Horizontal open	Self-contained	Low	$1.92 \times TDA + 7.08$	
VCT.SC.I	Vertical transparent door	Self-contained	Ice cream	$0.67 \times TDA + 3.29$	
VCS.SC.I	Vertical solid door	Self-contained	Ice cream	$0.38 \times V + 0.88$	
HCT.SC.I	Horizontal transparent door	Self-contained	Ice cream	$0.56 \times TDA + 0.43$	
SVO.RC.L	Semivertical open	Remote condensing	Low	$2.27 \times TDA + 6.85$	
VOP.RC.I	Vertical open	Remote condensing	Ice cream	$2.89 \times TDA + 8.7$	
SVO.RC.I	Semivertical open	Remote condensing	Ice cream	$2.89 \times TDA + 8.7$	
HZO.RC.I	Horizontal open	Remote condensing	Ice cream	$0.72 \times TDA + 8.74$	
VCT.RC.I	Vertical transparent door	Remote condensing	Ice cream	$0.66 \times TDA + 3.05$	