

All-in-One Self-Standing Open Refrigerating Display Case

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1. Introduction

Recently, there have been strong demands from food retail stores such as supermarkets to reduce total costs, which include running, initial and maintenance costs.

The number of goods has increased as a result of diversified eating habits. It is also required that these goods be easy to select and purchase.

In response to these requirements Fuji Electric has developed all-in-one self-standing open refrigerating display cases. These all-in-one self-standing open refrigerating display cases have been favorably received since their introduction to the marketplace. A summary of these cases is presented below.

2. Overview of All-in-One Self-Standing Open Refrigerating Display Cases

The all-in-one self-standing open refrigerating display cases are open cases that have been developed to provide “new friendly standards”. These all-in-one self-standing open refrigerating display cases can be classified into two types, multi-deck and island types. The series of island type open cases, which have excellent display efficiency and low initial and running costs, was enlarged. Furthermore, in combination with custom cases and various options, these cases will correspond to the individuality and diversity of each store.

2.1 Classification according to usage and construction

2.1.1 Classification according to usage

- (1) Daily deliveries and milk products
: +2 to +8°C
- (2) Meat and fish
: -2 to +2°C
- (3) Frozen foods
: -18°C or less
- (4) Ice cream
: -20°C or less
- (5) Refrigerating/freezing (2 temperatures)
: -2 to +7°C / -18°C or less

2.1.2 Classification according to construction

- (1) Multi-deck type
- (2) Wall-side island type
- (3) Dual-sided island type

By combining these types, a total of 30 models of cases have been developed in the series of all-in-one self-standing open refrigerating display cases.

3. Specifications and Construction

A summary of the specifications and cross-sectional views of typical cases are shown in Tables 1 and 2 and in Figs. 1 and 2 respectively.

4. Features of All-in-One Self-Standing Open Refrigerating Display Cases

The features of the newly developed all-in-one self-standing open refrigerating display cases will be described below.

4.1 Global environment friendly

To protect the ozone layer, a worldwide problem, HCFC-141b is used in the heat insulation foam material. Also, HCFC-22 is used as a refrigerant, eliminating the use of specific fluorocarbons.

4.2 Human friendly

The dimensions of each part of the case have been determined based on human engineering so that customers can easily view and retrieve goods without assuming an unnatural posture.

4.3 Product friendly

4.3.1 High-grade freshness control

With a microcomputer as standard equipment, the cabinets operate efficiently according to the operating state and changes in the environment.

4.3.2 Enhanced alarm functions

To rapidly respond to abnormalities, the following alarm functions have been enhanced: temperature abnormality inside the case, temperature sensor abnormality, a filter clogged with dust in the refrigerator, etc.

4.3.3 Environmental resistance

The cases can operate even when the condition of the air in the store is unsatisfactory (case ambient temperature 35°C and humidity 55% RH).

Table 1 Specifications of multi-deck series cases

Model			UFN5502-44A	UFN5502-64A	UFN5502-84A	
Main body	Usage			Daily deliveries and milk products		
	Operating temperature		(°C)	2 to 8		
	Ambient conditions			Ambient temperature 27°C or less, humidity 60% or less, wind 0.2 m/s or less		
	Effective internal volume		(L)	679	1,018	1,357
	Display area		(m ²)	2.62	3.93	5.25
	Mass		(kg)	290	320	390
	Main body length		(mm)	1,220	1,830	2,440
	Total height		(mm)	1,920	1,920	1,920
	Main body width		(mm)	995	995	995
	Front height		(mm)	550	550	550
	External and internal coating			Galvanized sheet coated with baked acrylic resin		
	Heat insulating material			Urethane foam		
	Diameter of drain outlet			30A	30A	30A
	Shelf dimensions		(mm)	375×1,216 ④	375×911 ⑧	375×1,216 ⑧
	Permissible load of shelf		(kg/sheet)	70	50	70
	Deck dimensions		(mm)	609×543 ②	456×543 ④	609×543 ④
	Permissible load of deck		(kg/sheet)	55	40	55
Refrigeration cycle	Evaporator			Forced air-cooled fin tube type		
	Condenser			Forced air-cooled fin tube type		
	Cooling system			Forced circulation cooling		
	Control system			Constant pressure expansion valve		
		Type	CFX-3403BH	CFX-3405BH	CFX-3410BH	
	Refrigerant			R-22		
	Overload protection			Automatic reset type		
	Temperature adjustment			Automatic temperature regulator		
	Defrost system			Off-cycle defrost		
	Compressor type			Totally sealed rotary type		
	Compressor nominal output		(W)	750	1,100	1,500
Refrigerant seal amount		(kg)	2.0	2.3	3.0	
Electrical rating (50/60Hz)	Single-phase 100V	Canopy illumination	Power (W)	48×1	38×2	48×2
			Current (A)	0.9	1.3	1.8
		Shelf illumination	Power (W)	48×5	38×10	48×10
			Current (A)	4.5	6.5	9.0
		Fan motor inside case (inner)	Power (W)	58/66	58/66	58/66
			Current (A)	0.62/0.68	0.62/0.68	0.62/0.68
		Fan motor inside case (outer)	Power (W)	23/21	23/21	23/21
			Current (A)	0.26/0.23	0.26/0.23	0.26/0.23
		Anti-dew heater	Power (W)	2.1	2.2	2.9
			Current (A)	0.21	0.22	0.29
		Sum	Power (W)	390/396	559/565	686/692
			Current (A)	6.49/6.52	8.90/8.93	11.97/12.00
	Three-phase 200V	Refrigerator	Power (W)	750/900	1,400/1,550	1,550/1,600
Current (A)			3.2/3.4	6.5/6.0	7.1/6.3	
Standard attachments				Microcomputer controller, filter for condenser, power supply plug and shelves		

Note: Numbers inscribed within a circle indicate the number of pieces.

4.4 Store friendly

4.4.1 Ease of cleaning

Since the all parts necessary to be cleaned can be detached and attached at a touch, frequent cleaning is facilitated.

4.4.2 Ease of moving

Since the cases are easily moved, time and labor are saved when changing the layout of the sales floor during remodeling or expansion.

4.4.3 Reduction of total cost

Since refrigerant piping and electrical wiring to

Table 2 Specifications of island series cases

Model			UFZ75M7-060A	UFZ75M7-080A	UFY75M7-060A	UFYZ75M7-080A	
Main body	Usage		Meat and fish				
	Operating temperature		- 2 to +2				
	Ambient conditions		Ambient temperature 27°C or less, humidity 60% or less, wind 0.2 m/s or less				
	Effective internal volume		(L)	270	360	220	290
	Display area		(m ²)	1.5	2.0	1.2	1.6
	Mass		(kg)	200	250	180	225
	Main body length		(mm)	1,830	2,440	1,830	2,440
	Total height		(mm)	950		950	
	Main body width		(mm)	1,080		910	
	Front height		(mm)	750		750	
	External and internal coating		Galvanized sheet coated with baked acrylic resin				
	Heat insulating material		Urethane foam				
	Diameter of drain outlet		30A		30A		
	Deck dimensions		(mm)	456×818 ④		456×648 ④	
	Permissible load of deck		(kg/sheet)	55		40	
Refrigeration cycle	Evaporator		Forced air-cooled fin tube type				
	Condenser		Forced air-cooled fin tube type				
	Cooling system		Forced circulation cooling				
	Control system		Constant pressure expansion valve				
			Type	VPX-3403BHS	VPX-3403BHS	VPX-3403BHS	VPX-3403BHS
	Refrigerant		R-22				
	Overload protection		Automatic reset type				
	Temperature adjustment		Automatic temperature regulator				
	Defrost system		Heater defrost				
	Compressor type		Totally sealed rotary type				
	Compressor nominal output		(W)	600×1	750×1	600×1	750×1
Refrigerant seal amount		(kg)	1.7	1.9	1.7	1.9	
Electrical rating (50/60Hz)	Single-phase 100V	Fan motor inside case (inner)	Power (W)	34/35		34/35	
			Current (A)	0.53/0.6		0.53/0.6	
		Anti-dew heater	Power (W)	85/85	112/112	85/85	112/112
			Current (A)	0.85/0.85	1.12/1.12	0.85/0.85	1.12/1.12
		Sum	Power (W)	119/120	146/147	119/120	146/147
			Current (A)	1.38/1.45	1.65/1.72	1.38/1.45	1.65/1.72
	Three-phase 200V	Refrigerator	Power (W)	600/680	810/940	600/680	810/940
			Current (A)	2.5/2.7	3.2/3.3	2.5/2.7	3.2/3.3
	200V	Defrost heater	Power (W)	600/600	800/800	600/600	800/800
Current (A)			3.0/3.0	4.0/4.0	3.0/3.0	4.0/4.0	
Standard attachments			Microcomputer controller ×1 Drain tank (12L)×1 Ceiling price tag plate rail (28 and 32mm sizes are used)×1 Power supply plug ×2				

Note: Numbers inscribed within a circle indicate the number of pieces.

the case are not necessary, installation is simple, resulting in low initial cost and a reduced construction period.

4.4.4 Enlargement of floor space

Since the space of refrigerator (machine room) is not necessary, floor space in the store can be effectively utilized.

4.4.5 Operation adjustments are unnecessary

Since the refrigerator, controller, etc. are all-in-one

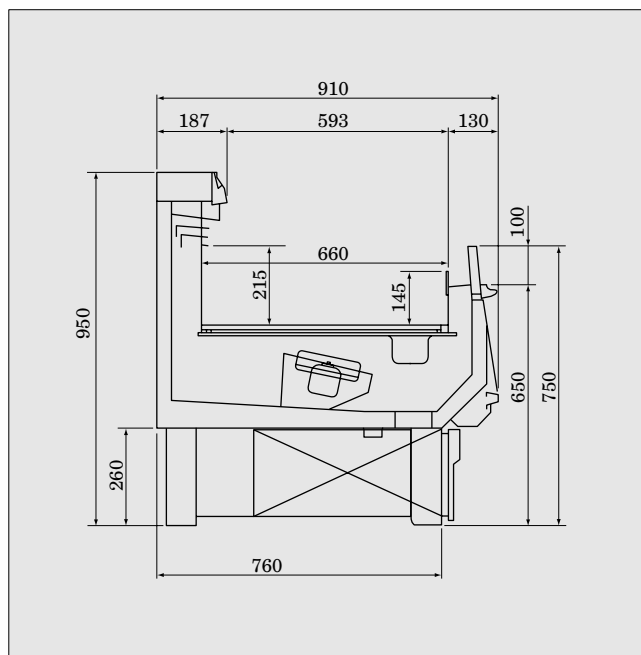
self-standing in the case, the case can operate immediately after installation as soon as the power supply plug is connected to an outlet.

5. Conclusion

A summary of the all-in-one self-standing open refrigerating display cases has been presented.

Since food retail stores are seeking originality by

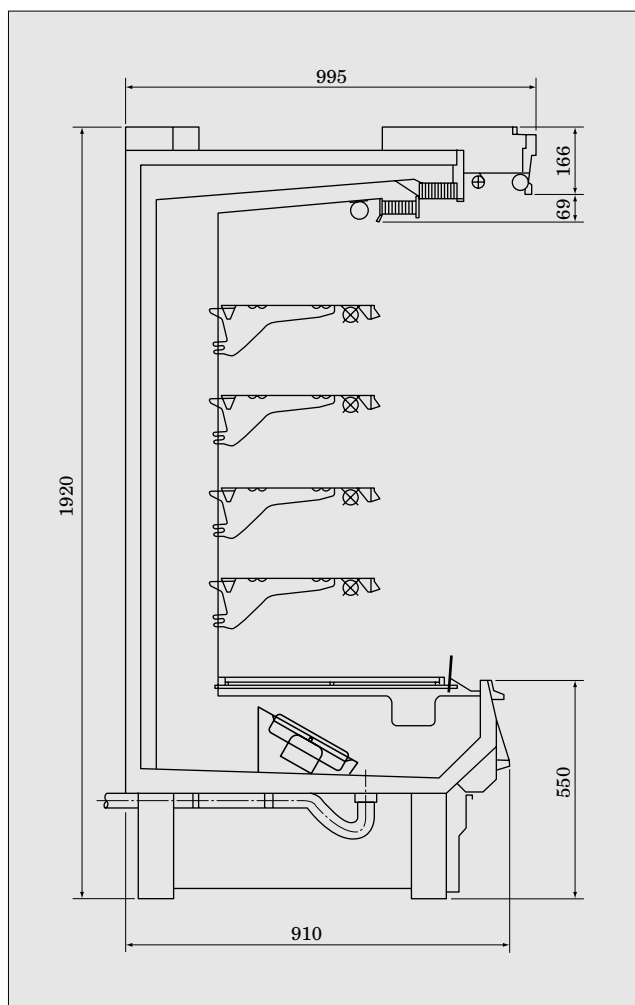
Fig. 1 Cross-section of the multi-deck series case



individualizing and diversifying, all-in-one self-standing open refrigerating display cases should be high-quality and low cost store equipment that fit in with the store's concept of originality.

Fuji Electric will continue to expand this series of case models and will endeavor to develop new all-in-one self-standing open refrigerating display cases.

Fig. 2 Cross-section of the island type series case



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