

# Super-Slimed Multi-Deck Open Refrigerating Display Case for Convenience Store

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## 1. Introduction

Recently in Japan, sales by convenience stores and the number of newly opened stores continue to grow, due to such conveniences as being open 24 hours.

At the same time, many original brand name goods have been developed in response to diverse eating habits. Display methods, ingredients, and the selling of merchandise has changed remarkably due to competition.

On the other hand, cost reduction is strongly required not only for the refrigerating display cases but also for the total costs, including running and installation, of the store.

To meet these market needs, Fuji Electric has developed a new series comprised of 8 types of super-slimed multi-deck open refrigerating display cases for the convenience store, having such features as elaborated display performance and a temperature control function (Fig. 1).

They have already been marketed and widely accepted.

Fig. 1 External view of super-slimed multi-deck open refrigerating display case



## 2. Outline of the Super-Slimed Multi-Deck Open Refrigerating Display Cases for Convenience Stores

- (1) All 8 types come in either a basic length of 650mm or 750mm.
- (2) The case is designed so that a single case can handle a variety of goods ranging from lunches (15 to 20°C) to dairy products (3 to 8°C).
- (3) The front sizes (case width) come in 4 basic sizes.
- (4) The front height is 500mm for all types.

## 3. Features

- (1) Standardized equipment of the new microcomputer controller improves installation and service.
- (2) Application of a double-layered construction in all types saves more energy.
- (3) The application of return grills that are easily attachable/removable and the subdivision of the shelf pitches improve handling and display performance.
- (4) Adoption of a return grill with a radial corner maintains cleanliness.

## 4. Specifications and Construction

Refer to Table 1 for the specifications and Fig. 2 for construction.

### 4.1 Improved installation and service

- (1) For achieving elaborated freshness control, all types are equipped with a new standard microcomputer controller, a first in the convenience store field.

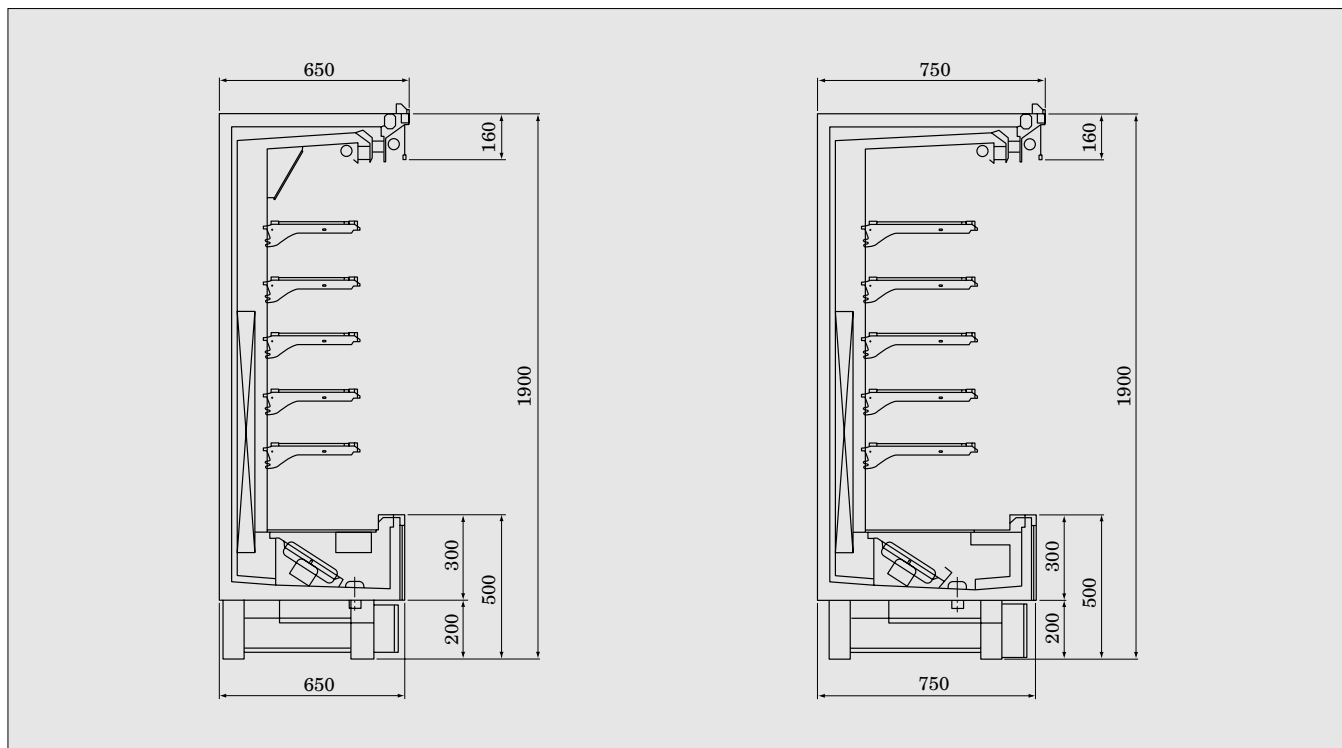
Figure 3 shows the input/output configuration of the new microcomputer controller. Its functions include temperature indication, alarm indication and temperature control, and adaptive control according to its installed environment is possible.

- (2) All types are equipped with standard magnetic valves which drastically simplify installation.
- (3) The newly developed case can control temperature, ranging from the lunch case (15 to 20°C) to

Table 1 Specifications of super-slided multi-deck open refrigerating display case

Item		Type	MFQ50D2 -035BM	MFQ50D2 -045BM	MFQ50D2 -055BM	MFQ50D2 -065BM	FT50D2 -035AFG	FT50D2 -045AFG	FT50D2 -065AFG	FT50D2 -085AFG
Usage			Goods delivered daily/dairy products (lunches)							
Applied temperature		(°C)	3 to 8    (15 to 20)							
Effective capacity		(L)	389	518	611	777	467	623	934	1,245
Shelf area		(m <sup>2</sup> )	1.73	2.30	2.72	3.46	2.07	2.76	4.14	5.52
Mass		(kg)	130	170	220	260	150	190	285	380
Drainage diameter			40A							
External size	Overall height	(mm)	1,900							
	Overall width	(mm)	915	1,220	1,440	1,830	915	1,220	1,830	2,440
	Canopy length	(mm)	650				750			
	Front length	(mm)	650				750			
	Front height	(mm)	500							
Freezing capacity	Required freezing capacity	(kW)	0.76	0.85	1.16	1.45	0.82	0.94	1.53	2.00
	Evaporation temperature	(°C)	- 10							
	Coolant		HCFC-22							
Defrosting capacity			Off-cycle (4 times per day)							
Power consumption 50Hz		(W)	121	142	188	256	121	142	256	304
Single phase (100V) 60Hz		(W)	125	146	195	262	125	146	262	310
Shelf composition, types (width×row)			3'×1	4'×1	2.5'×2	3'×2	3'×1	4'×1	3'×2	4'×2
			Glass shelf							

Fig. 2 Cross section of super-slided multi-deck open refrigerating display case



the dairy product case (3 to 8°C) with the temperature setting function of the new microcomputer controller.

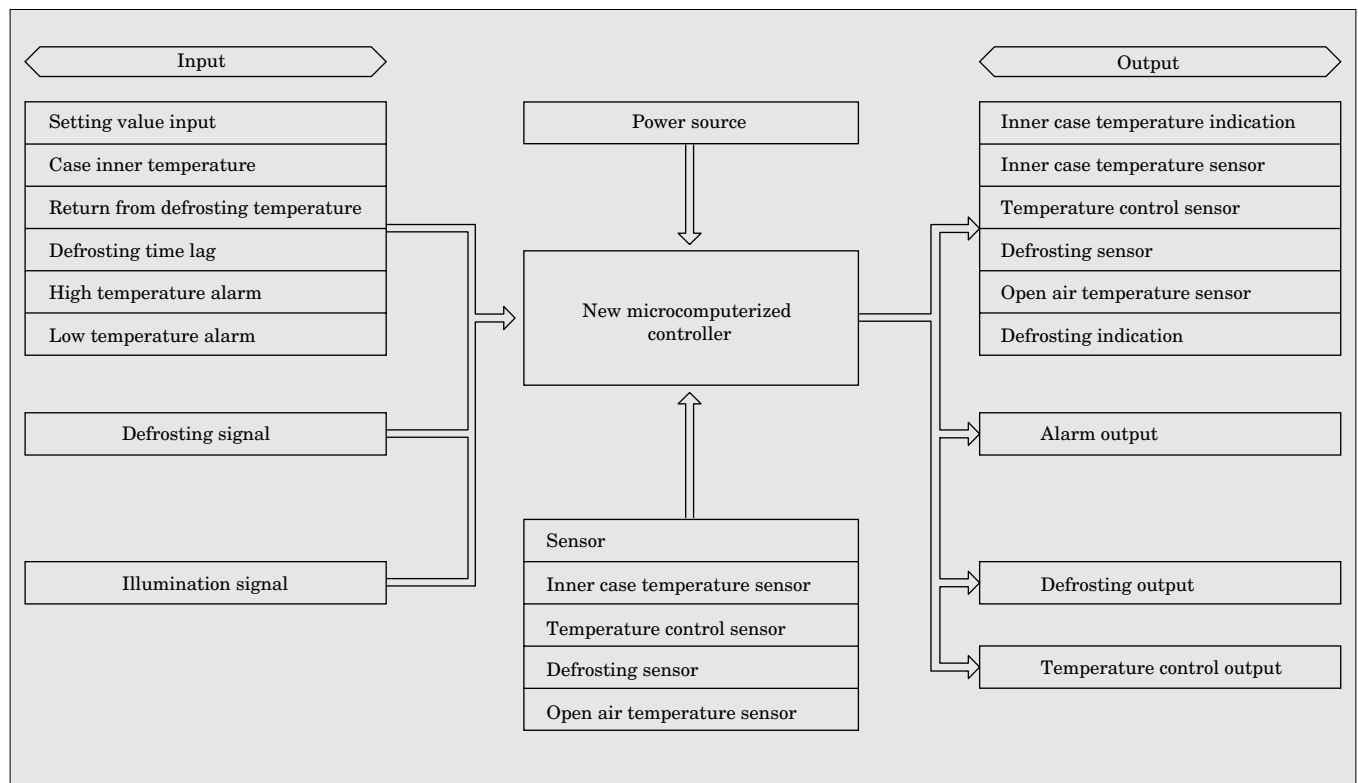
- (4) Most convenience stores are open 24 hours a day, 365 days a year and require minimized maintenance time. Thus, the control devices and fan

motor are located at the bottom for easier regular maintenance.

#### 4.2 Energy saving

- (1) By applying a double-layered construction and high density honeycombs for all types, energy

Fig. 3 Input/output configuration of the new microcomputer controller



savings of about 30% (compared with our conventional cases) are achieved.

- (2) The adoption of a wide backflow (cold air blown directly out of the back wall of the case) dissolves the temperature variance among the merchandise in the case.
- (3) The application of full-face glass shelves eliminates lighting on every shelf, attaining 15 to 20% in energy savings.

#### 4.3 Improved handling and display performance

- (1) The subdivided variable shelf pitches (25mm to 15mm) allow a variety of merchandise to be displayed in the convenience store, corresponding to the diverse number of items.
- (2) The unification of the shelf plate with the bracket improves handling by facilitating change of the shelf position.
- (3) For easier search and removal of the merchandise, the front height (decreased from 550mm to 500mm), shelf size and shelf position are determined based on human engineering.
- (4) Application of the acrylic illumination plate for the canopy enhances advertisement of the merchandise.
- (5) By unifying the external appearance of all 8 types

with a single design, the store's interior is improved.

#### 4.4 Improved cleaning

- (1) All parts to be cleaned including the honeycombs, glass shelves, price tag rails on the shelves, drain filters, and return grills are attachable/removable with a single touch. This construction facilitates frequent cleaning in the store.
- (2) Application of a larger, specially formed return grill and a radius at the rear part of the deck pan improves safety and cleaning.
- (3) Application of the straight back wall and stainless steel bottom pan improves cleaning.

#### 5. Conclusion

The decrease in consumption caused by the recession and the need for distinguished sales against competitors drive convenience stores to select more diversified specifications for individual chain stores.

This makes it necessary for the supplier to offer not only cases but a complete proposal, including additional equipment, utensils and refrigerators.

In the future, we at Fuji Electric intend to develop products with originality.



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