

# Island Type Open Refrigerating Display Case

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## 1. Introduction

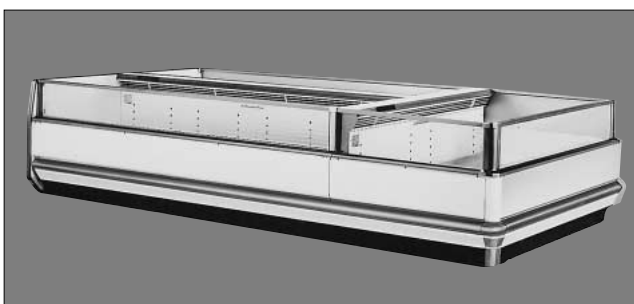
In supermarkets, exhibiting and selling methods of goods have remarkably changed as stores have become larger, resulting from the deregulation of the Large Scale Retail Store Law, thereby strengthening their ability to compete against other stores. Furthermore, there are strong demands to reduce not only display case price but also total price, including limiting store operating and construction expenditures.

Therefore, island type display cases, which have low initial and running costs, are gaining popularity and demand for them is rapidly increasing. Against such a background, Fuji Electric has developed and brought its “Fresh MAX series of island type open refrigerating display case for supermarkets” to the marketplace. A summary is presented below.

## 2. Overview of island Type Open Refrigerating Display Cases for Supermarkets

Island type open refrigerating display cases open at the top and forcibly circulate cold air cooled with an evaporator to form an air curtain at the plane of the opening. These cases are classified as follows according to usage and construction. There are three classifications according to usage: for meat and fish ( $-2$  to  $+2^{\circ}\text{C}$ ), frozen food ( $-18^{\circ}\text{C}$  or less) and ice cream ( $-22^{\circ}\text{C}$  or less). Cabinet construction can be roughly classified into two types: wall-side models and dual-sided models, with variations for each type depending

Fig. 1 External view of Fresh MAX series island type open refrigerating display case for supermarkets



on the widths. There is also a series of standardized cabinets that have inside illumination to light up the goods or an inclined mirror to create the effect of an abundance of goods. As a result, there is a total of 43 case models. In addition, corner type cases, custom cases and other options are available to meet a variety of individual needs.

## 3. Features of Island Type Open Refrigerating Display Cases

### 3.1 Construction

#### (1) Wall-side island type models

The wall-side island type open refrigerating display case has a nozzle at the rear and an inlet at the front of the case as shown in Fig. 2. Therefore, the goods can be arranged on a level plane, with the benefit that customers can see all the displayed goods at a glance when standing at the front of the case.

Further, the case has a large glass plate attached to the front enabling customers to see the goods inside the case even from a distance.

#### (2) Dual-side island type models

The construction of the typical MFX type dual-

Fig. 2 Cross-section of the wall-side island type open refrigerating display case

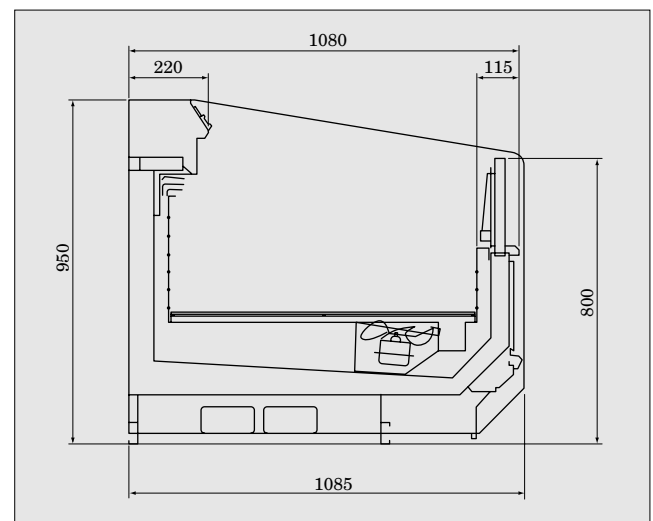
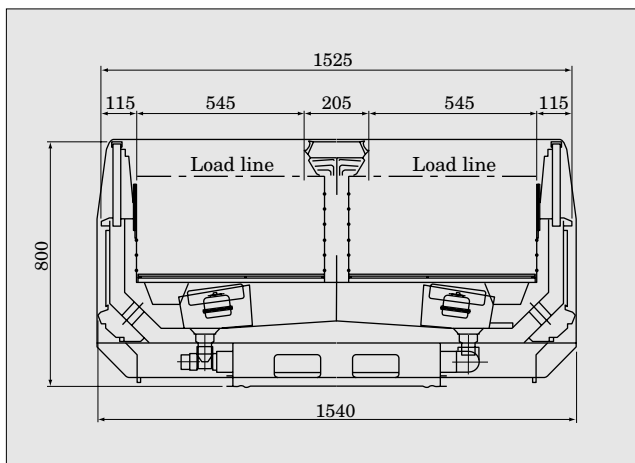


Fig. 3 Cross-section of the dual-sided island type open refrigerating display case



sided island type open refrigerating display case is shown in Fig. 3. This case has nozzles for cold air at its center and inlets are provided at both sides. With this configuration, goods can be arranged on both sides of the cabinets, and therefore, these cases are installed along passageways in the store. The cold air blown out from the center is suctioned into each inlet, and sent by fans to the evaporators. The cold air path is constructed so that cold air from both sides is mixed in a central air duct to prevent temperature inequalities at both sides of the cases and then blown out from the nozzles. The construction utilizes a large glass plate at the front, as in the wall-side model.

### 3.2 Improvement of exhibition ability

#### (1) Expansion of effective internal volume

Here, we will describe the dual-sided island type refrigerating display case for exhibiting ice cream, an item of interest in recent years. The case's internal width and depth were determined after investigating the dimensions of many cup-type ice cream goods. As a result, the effective internal volume has been expanded by 35% over previous models, achieving the maximum internal volume in the industry world-wide. Furthermore, the sales capacity is remarkably improved because of the increased display volume per case.

#### (2) Enrichment of exhibition functions

Options such as internal partitions for the goods, attached illumination and a POP rail at the front table part are available to enrich the exhibition functions.

### 3.3 Improvement of operating characteristics

#### (1) New microcomputer controller

All of the cases are equipped with a new standard microcomputer controller to enable high-grade freshness control. In dual-sided island type cases, in order to enable temperature setting and temperature verifi-

cation for either side of the case, two displays are provided at the center to improve operability.

### 3.4 Reduction of total cost

#### (1) Reduction of running cost

##### (a) Reduction of required refrigeration capacity

The required refrigeration capacity was reduced by 30% compared with previous models by equalizing the wind velocity blown out from the nozzle in the long direction, improving the cross-sectional wind velocity balance and developing a high-efficiency evaporator. This has resulted in a remarkable reduction of the running cost.

##### (b) Reduction of heater capacity for preventing dew condensation

A large glass plate is attached to the front of the case. Dew condensation occurs on the outside surface of the glass plate due to low temperature inside the case and obstructs the display. Conventionally, a transparent heater panel stacked on the surface of the glass to form a "paired glass" is used as a countermeasure. A special pair glass, which has lower heat conductivity than that of the conventional one, was newly developed to reduce this heater capacity. With this new pair glass, the heater capacity for preventing dew condensation was reduced by 15% compared with previous models.

#### (2) Reduction of initial cost

##### (a) Review of basic construction

After reviewing the basic construction, the MAX series and other case types (multi-deck cases and semi-multi-deck case) were thoroughly standardized. Furthermore, the assemblies for attaching the glass plate and case duct have been simplified and the number of parts dramatically reduced.

##### (b) Reduction of installation work cost

The cost to have the case installed is drastically reduced owing to the miniaturization of the refrigerator due to the reduction of the required refrigeration capacity, simplification of the wiring work by the reduction of the heater capacity, and the 200V. AC power supply for the display case.

## 4. Conclusion

In this paper we have presented a summary of the island type open refrigerating display cases for supermarket. As in the case of multi-deck open cases, many improvements such as lower cost, reduced required refrigeration capacity, and an improved display have been realized. We believe that these improvements meet the need for total cost reduction. At that time, Fuji Electric will strive to promote energy savings and to expand the varieties of the display case in response to widely diversifying needs.



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