Summer 2022
HYTEM NEWS

In this issue, introducing 4. 24 hours real-time computer system and ventilation control system to support precise automated egg farm management

HYTEM Technology

1. EFA (Egg Farm Automation) targeting Rats and AI Free
2. Ultimate Zero crack and the most efficient Egg Collecting system in the industry
3. The most advanced manure handling in the industry
4. **24 hours real-time computer system and ventilation control system to support precise automated egg farm management**

24 hours real-time computer system and ventilation control system to support precise automated egg farm management

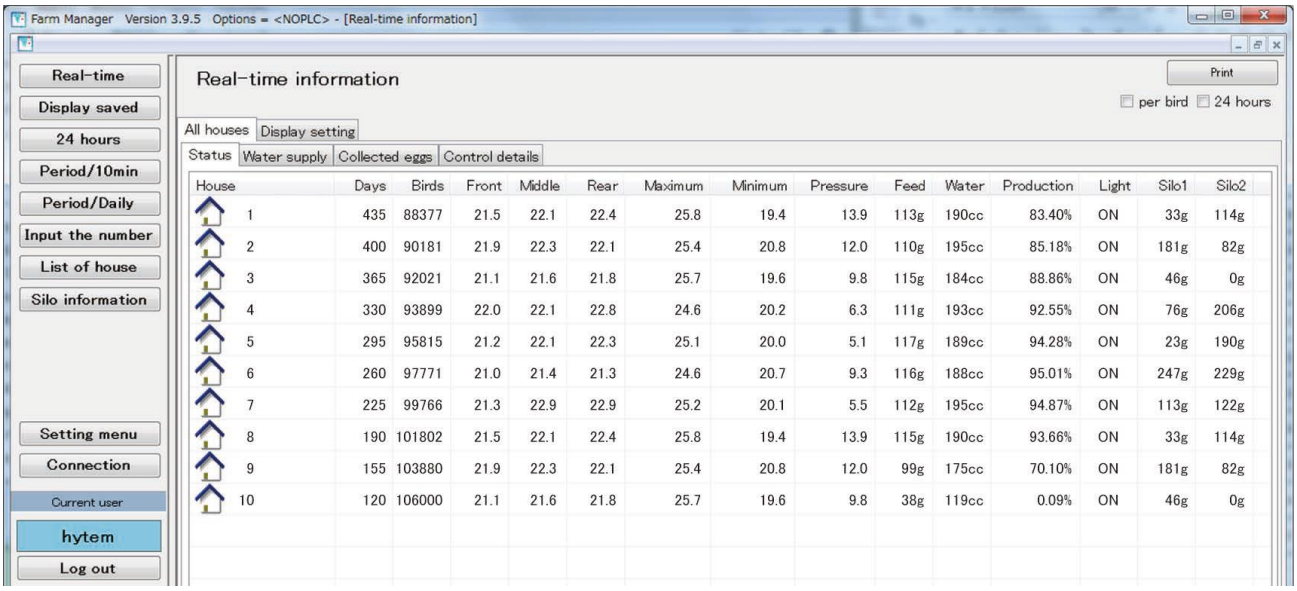
Part 1 HYTEM Farm Computer System

The farm computer system has been created with HYTEM's more than 30 years' experience with egg farms in Japan which are at the top level in the world. This real-time information system is configured with Farm Manager, Farm Staff, Egg Flow Control to support efficient egg collection and minimize egg cracks, which introduced in winter 2022 HYTEM NEWS.

The system is so organized that remote access from the outside of the farm is possible when the internet environment is available.

Farm Manager

The simple, reliable, loyal and smart **24-hour real-time computer system** provides powerful support for comfortable and precisely automated egg farms.

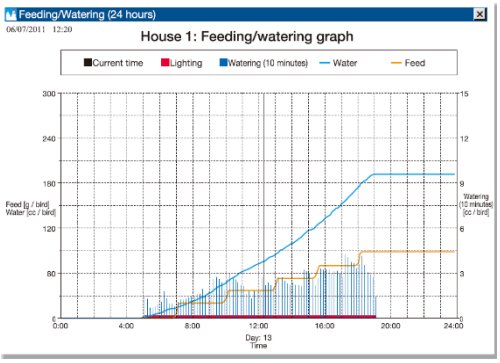


House	Days	Birds	Front	Middle	Rear	Maximum	Minimum	Pressure	Feed	Water	Production	Light	Silo1	Silo2
1	435	88377	21.5	22.1	22.4	25.8	19.4	13.9	113g	190cc	83.40%	ON	33g	114g
2	400	90181	21.9	22.3	22.1	25.4	20.8	12.0	110g	195cc	85.18%	ON	181g	82g
3	365	92021	21.1	21.6	21.8	25.7	19.6	9.8	115g	184cc	88.86%	ON	46g	0g
4	330	93899	22.0	22.1	22.8	24.6	20.2	6.3	111g	193cc	92.55%	ON	76g	206g
5	295	95815	21.2	22.1	22.3	25.1	20.0	5.1	117g	189cc	94.28%	ON	23g	190g
6	260	97771	21.0	21.4	21.3	24.6	20.7	9.3	116g	188cc	95.01%	ON	247g	229g
7	225	99766	21.3	22.9	22.9	25.2	20.1	5.5	112g	195cc	94.87%	ON	113g	122g
8	190	101802	21.5	22.1	22.4	25.8	19.4	13.9	115g	190cc	93.66%	ON	33g	114g
9	155	103880	21.9	22.3	22.1	25.4	20.8	12.0	99g	175cc	70.10%	ON	181g	82g
10	120	106000	21.1	21.6	21.8	25.7	19.6	9.8	38g	119cc	0.09%	ON	46g	0g

Any languages in a computer can be input for screen displays

Status information

The information indispensable for flock management, such as the current feeding and watering quantities, number of eggs laid, and inside and outside temperatures, is continuously sent to easy-to read analytical screens in real time 24 hours a day. Cumulative data of the past 24 hours is displayed for feeding and watering quantities, and the number of eggs laid. Any deviation from target values is displayed with a yellow background for Caution and red background for Warning. **Patented** The absence of yellow or red values on the status screen means that the basic control of the farm is being properly maintained and there are no problems. If a value is displayed in red, urgent actions are required. In daily management, the focus of your activities should be on the houses indicated with yellow values and on daily inspections. From the daily cumulative data, you can switch to the feeding and watering quantities for the day (after 0:00 a.m.) with a simple key strokes.



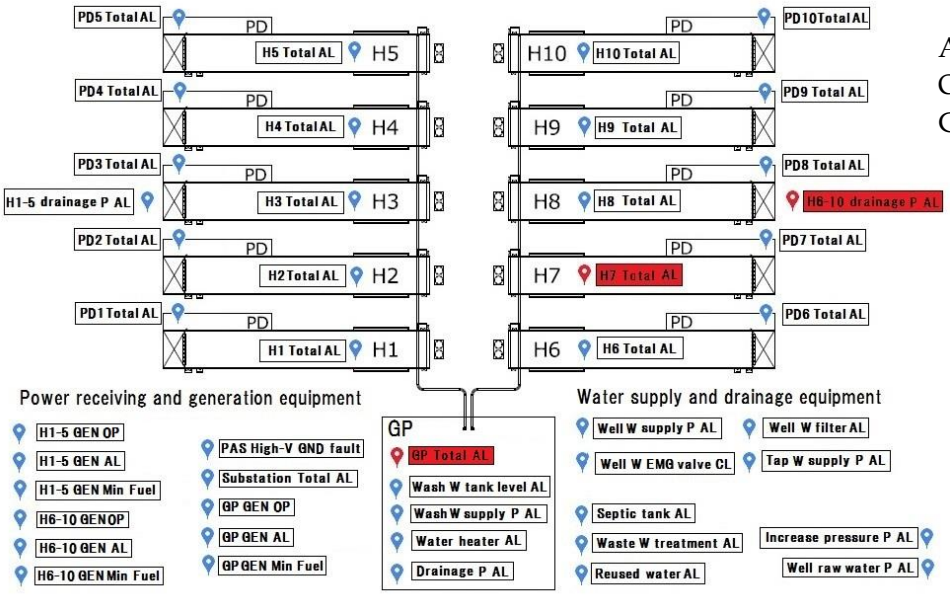
Feeding/watering graph

This graph is one of the most used screens of Farm Manager. The layers eating status can be found out from the Watering (10 minutes) bar graph. The left part of the time line shows the feeding/watering data for the day and the right part of the line shows the data for previous day. The gap between the right and left parts of the line presents an important piece of management information.

The development of HYTEM Egg Farm TIS (Total Information System) has been just completed, the first installation of which will be proceeded in this year at 1.4 million egg complex in Tokyo area. And TIS will be operated in conjunction with Farm Manager.

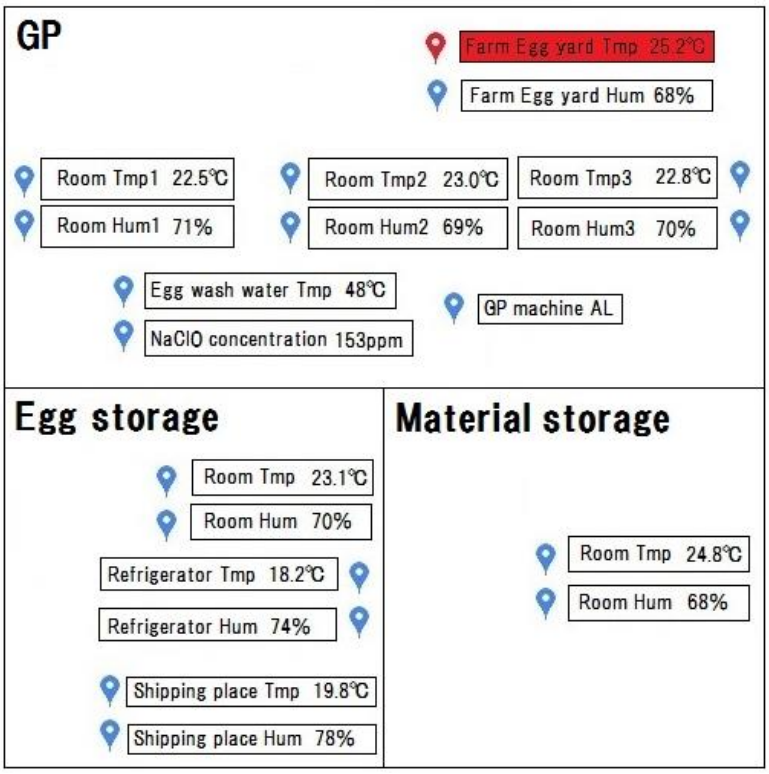
The image of TIS is as follows.

Note: GP in diagrams is Grade and Packing center



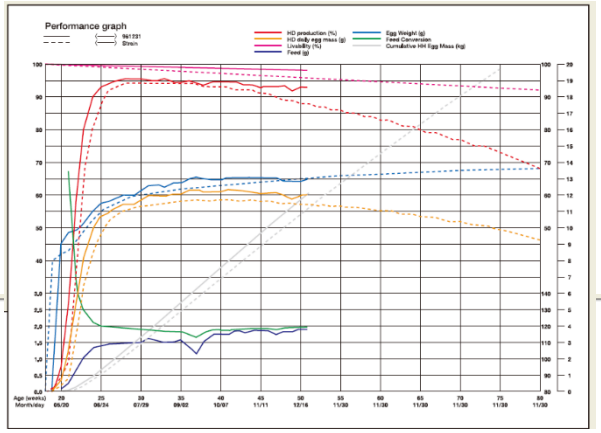
AL: Alarm
OP: Operation
CL: Close

TIS Overview



Farm Staff

Farm Staff connects **Farm Manager**, in which data is displayed in real time, with the compilation software data that is managed in the office for each flock. The screen on which **a weekly report** is compiled and **performance graphs are plotted especially helps the farm manager to make an exact flock management plan by showing the current performance status of the flocks.**



Weekly Report

House: House 3 Lot: 961231

Period: Age (weeks) 51 weeks
Age (days) 351 to 357 days
Date: 12/17/2011–12/23/2011

Date	Age (days)	Birds	Livability (%)	Mortality (birds)	Mortality (%)	Production (%)	Daily egg mass (g)	Egg Weight (g)	Feeding (g)	Feed Conversion	Cumulative HH Egg Mass (kg)	Max. temp. (°C)	Average temp. (°C)	Min. temp. (°C)	Lighting (hours)
2011.12.17	351	30705	98.15	4	0.01	93.02	60.4	64.9	118.3	1.96	11.763	20.3	20.2	18.8	17:00
2011.12.18	352	30701	98.14	4	0.01	92.69	60.2	64.9	118.3	1.97	11.822	21.3	20.1	19.3	17:00
2011.12.19	353	30694	98.12	7	0.02	92.92	60.3	64.9	118.3	1.96	11.881	21.0	20.4	18.8	17:00
2011.12.20	354	30689	98.1	5	0.02	92.85	60.3	64.9	118.3	1.96	11.940	20.7	19.9	19.0	17:00
2011.12.21	355	30682	98.08	7	0.02	92.73	60.2	64.9	118.4	1.97	11.999	20.6	2.00	19.3	17:00
2011.12.22	356	30676	98.06	6	0.02	92.72	60.2	64.9	118.4	1.97	12.058	20.5	20.1	18.9	17:00
2011.12.23	357	30676	98.06	0	0.00	92.68	60.1	64.9	118.4	1.97	12.117	21.3	2.00	18.9	17:00
Weekly total		30676	98.06	33	0.11	92.80	60.2	64.9	118.3	1.97	12.117	21.3	20.1	18.8	17:00

Part 2 Ventilation control system

HYTEM Ventilation System is New Tunnel Ventilation System, except some specific cases, for an example, Pressurized Ventilation to minimize dusts exhausted.

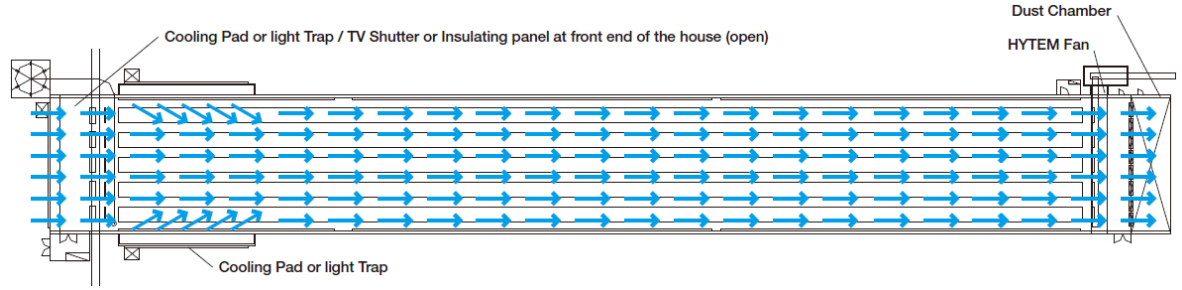
New Tunnel Ventilation System

Patented

The New Tunnel Ventilation System developed by HYTEM **switches between Summer and Winter Modes** to resolve the drawbacks that conventional tunnel system have. (Common winter problems are a large temperature difference between the front and rear ends of the house, susceptibility to power failure, etc.)

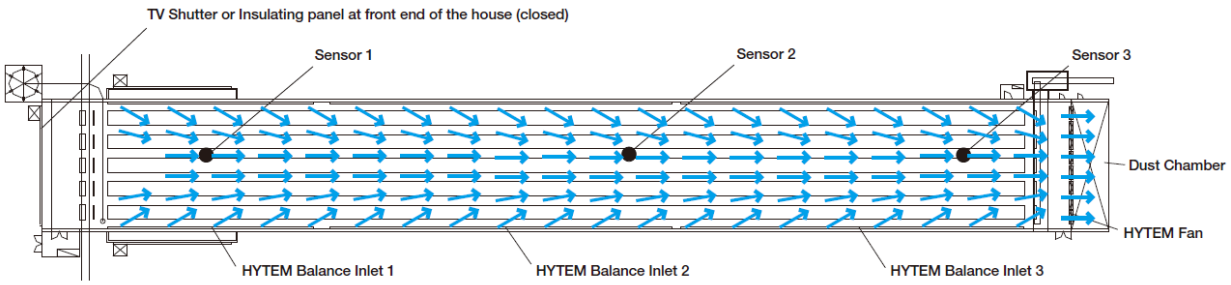
With this system **air flows through every cross-section in the poultry house with no dead spots (air stagnation spots)**, just as water flows through a hose. Furthermore, **dust can be quickly ejected into the dust chamber**, which produces a **clean** environment with less bacteria in the house. All of these contribute to good performance.

● Summer mode



The Balance Inlets installed in the upper section of the walls are all closed so that fresh air can enter from the front, quickly flow through the entire house and exit out of the house within 20 to 30 seconds. The flow of fast air formed through the entire house decreases the temperature felt by layers, and at the same time, prevents heat accumulation in the house. Where Cooling Pads are installed, water flows through the pads when a set temperature (usually 30 to 33°C) is reached to cool the fresh air that flows into the house.

● Winter mode 3-zone control



The opening in the front of the poultry house is closed with TV shutters or insulating panels, or the opening is adjusted in spring/autumn. Fresh air enters from the 3 Balance Inlets installed in the upper parts of the walls.

One temperature sensor is installed in each of the 3 inlets zones. These sensors detect temperature differences occurring between 3 inlet zones and send this information to the ventilation control computer.

The computer then sends an open or close signal to the drive units of the inlets in order to minimize the temperature difference. (The average of the temperatures sensed by the 3 sensors is used. Control with specific sensors is also possible.)

● 3 Balance Inlets
Drive unit with emergency open mechanism

To improve warmer house environment in winter time, P-Plus 3-zone Control has been developed.

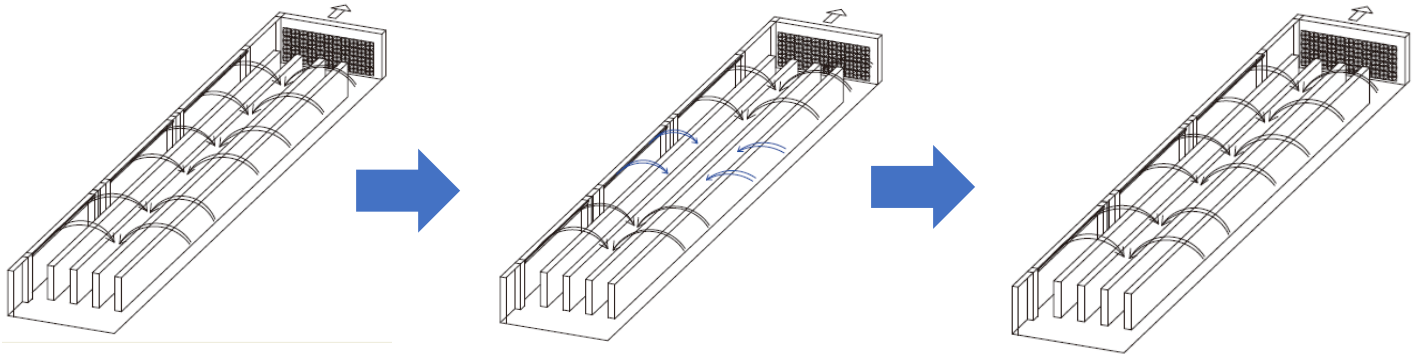
P-Plus 3-zone Control

Patented

● One step improved house environment

The entire house is kept at a uniform temperature by 3-zone control. When the number of running fans change, all Inlet openings will be reset by P-Plus control and the incoming air comes in constantly. Thus outstanding house air quality without stagnant spots will be realized.

The P-Plus maintains the house warm in good quality air even in a cold period from October to March and contributes to profit increase through improved feed efficiency, targeting 4℃ higher, which could bring year 2% better feed efficiency, big money!



Static pressure is stabilized.

A temperature rises at the central section of the house.
→Increases opening of Inlets to reduce the temperature.
→Air speed in the inlet drops.

Re-setting the position of all inlets by P-Plus control
→Static pressure becomes stabilized again with a constant fresh air from all inlets.

Part 3

HYTEM is paying attention to performances of ventilation hardwares, which will influence layers' performances through the house environment, and electricity bills, one of important Profit No.2 of egg production. (Reference: The back cover of HYTEM Egg Farm Automation catalogue).

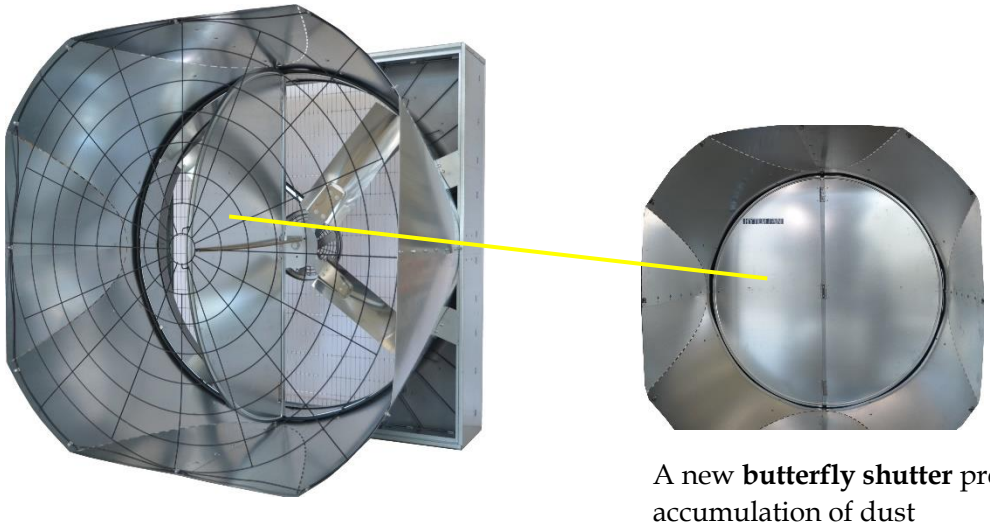
There are 4 items, Fan, Cooling pad, TV Shutter and Emergency Door.
In this HYTEM NEWS, points to be considered are referred. For details, please refer each HYTEM catalogue.

Fan

The minimized electricity consumption to move air is important to minimize electricity bills. HYTEM is offering 2 types fan, BF 140, and CF 150 which is released recently.

Cone Fan CF150

Newly Developed Product



A new **butterfly shutter** preventing accumulation of dust

Box Fan BF140

A following table is showing an example of a trial calculation.

Fan Electricity Comparison A Farm

100,000 birds/house x 5 houses = 500,000birds

1. Number of Fans per house

Case A HYTEM Fan	CF150	32 units	
Case B	BF140	45.3 units (theoretical units to get the same air volume as Case A)	

NOTE 1: Theoretical units calculation for Case B (Refer to Specifications of fan attached)

CF150	808 m3/min	×	32 units	=	25,856 m3/min
BF140	25,856 m3/min	÷	571 m3/min	=	45.3 units

2. Electricity Consumption per house

Average operating rate per year (60% of all fans)

Case A	CF150	32 units	×	60%	=	19.2 units
Case B	BF140	45.3 units	×	60%	=	27.2 units

NOTE 2: Temperature of A farm area.

℃	Max.Ave.	Ave.	Min.Ave
January	8	3	0
August	32	28	24

Case A	CF150	808 m3/min	×	60 min/h	=	48,480 m3/h
		48,480 m3/h	×	19.2 units	=	930,816 m3/h
		931 1000m3/h	×	27.46 W/1000m3	=	25,565 W
						25.565 kW
Case B	BF140	571 m3/min	×	60 min/h	=	34,260 m3/h
		34,260 m3/h	×	27.2 units	=	931,187 m3/h
		931 1000m3/h	×	34.04 W/1000m3	=	31,691 W
						31.691 kW

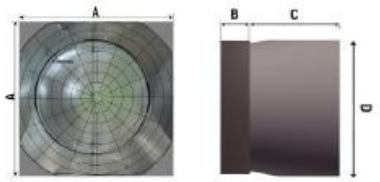
3. Yearly Electricity Bill Comparison per house

Case A	CF150	25.565 kW	×	8,760 h/year	=	223,952 kWh/year
		223,952 kWh/year	×	0.15 USD/kWh	=	33,593 USD/year
Case B	BF140	31.691 kW	×	8,760 h/year	=	277,615 kWh/year
		277,615 kWh/year	×	0.15 USD/kWh	=	41,642 USD/year

Electricity Bill Difference in 20 years USD 804,900 (1.6 USD/bird)

(41,642 USD/year - 33,593 USD/year = 8,049 USD/year) x 5 houses x 20 years

HYTEM Fan Specifications

Type		Cone Fan CF150					Box Fan BF140				
Dimensions											
	Fan Diameter	55″ (1397)					51″ (1295)				
	A	1495					1380				
	B	430					405				
	C	830					-				
Weight	kg	110					68				
Electrical Capacity	HP	1.5					1				
	KW	1.1					0.75				
Performances	Static Pressure Pa	0	10	20	30	50	0	10	20	30	50
	Note1 ㎥/min	893	853	808	757	650	621	598	571	535	427
	W/1000㎥	22.00	24.50	27.46	31.08	40.00	30.24	31.83	34.04	36.91	48.71
Note2 Sound Level dB		76.6					70.4				

Note1: Corn Fan CF150 measurements are by Bess Lab' s(Illinoi USA) Test No.17563
Box Fan BF140 measurements are by AMCA210/ISO05801 along Bess Lab' s(Illinoi USA) standards

Note2: At 2m point by ISO03744

Cooling Pad

Cooling efficiency which will influence layer performances, and pressure loss which will influence electrical bills are very important. The former is coming from paper quality & flute design, and the latter is from the flute design.
The cooling pads looks same, but above difference is critically important again for Profit No.2.

The cooling pad is parts requiring periodical replacement. Black Plus, surface 1 cm deep of which is plastic coated is worthwhile to consider. Durability is longer, and more easily cleaned by a high pressure cleaner.

TV Shutter

At the area where Summer and Winter mode switching required, it will help the smoother & easier switching especially in spring and autumn when the daily maximum and minimum temperature difference is substantial.

Emergency Door

Newly developed HYTEM Lateral Emergency Door which closes automatically when electricity come back, and offers periodical checking by simple switching, will offer comfortable farm management. The perfect tightness of the door is another feature.