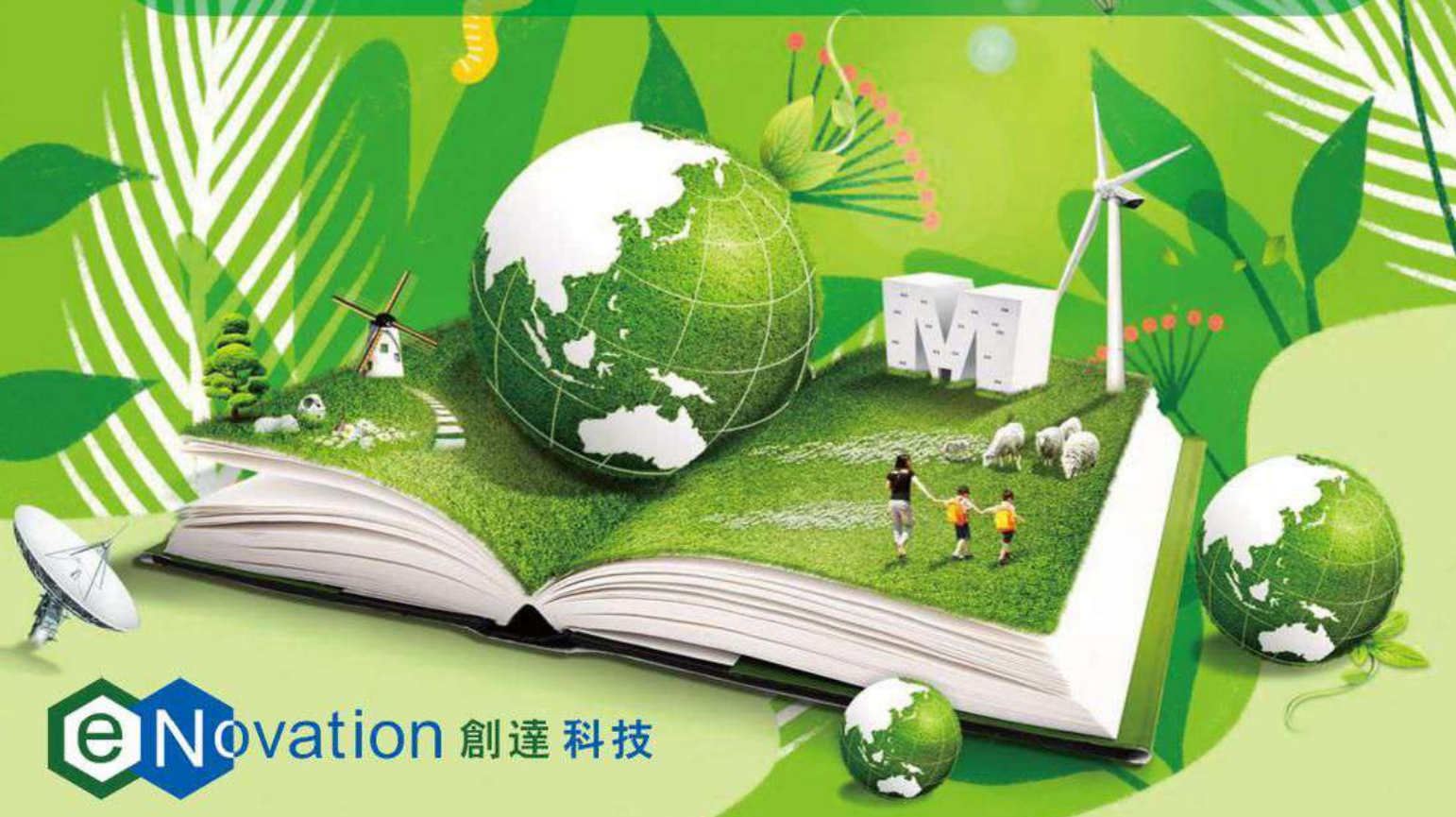


創達科技成立於2013年初，是一家年青，有活力；以領先技術導向和品質為先的高新科技公司。主要業務為提供環保節能、室內空氣品質、智能系統和資訊網絡技術產品方案等。我們相信以創新技術開放的優質產品，配合開發團隊的無限創意和服務團隊的專業服務，客戶便能夠親身體驗各種嶄新的意念並有效地應用科技，以提升競爭力，擴展業務，推動經濟。

創達科技引進的節能、節水和室內空氣淨化的各種可持續發展方案，皆以技術領先和經濟效益並重，而深受業界歡迎。因此，各式各樣由創達科技推動的高新技術正廣泛被企業採用。我們會繼續開發和引進各種新科技，不斷改善和提升服務，為客戶提供全方位的優質科技方案。


創達科技將繼續以澳門為根，以科技為軸，以客戶為先，以質量取勝！

www.enovation.mo / info@enovation.mo





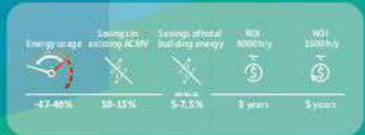
ZERAX® FAN GREEN INNOVATION

- ✦ EFFICIENCIES UP TO 92%
- ✦ ENERGY SAVINGS UP TO 50%
- ✦ 20+ YEARS OF LIFETIME
- ✦ LOW SOUND LEVELS
- ✦ ROBUST AND RELIABLE DESIGN
- ✦ AVAILABLE AS EC + SOLUTION 

Building & Industry



Case Story Keppel Bay Tower



Before
Centrifugal
blower system



After
ZerAx® &
Danfoss EC+

Key Benefits

- Annual energy consumption reduced from 39,279 kWh to 18,807 kWh
- System Efficiency improved from 60% to 82%
- Energy savings of 46% to 48%
- Specific Fan Power improved by 46%
- Sound level reduced by between 3% to 17%
- System resistance reduced by 35%
- Significant reduction in CO₂ emissions
- 98% recyclable at end of useful life
- Retrofit completed in 12 hours

As reported by independent ESCO consultant and verified by BCA



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INCREASED PRODUCTIVITY
ENERGY-SAVING. COST REDUCTION
ENVIRONMENTAL FRIENDLINESS



YASKAWA GA700



THE NEW GENERATION DRIVE
FOR INDUSTRIAL APPLICATION



HV 600
HVAC Drives
for Fan and Pump
Application

SCALEBUSTER

ISBF - a 2 stage whole-house water filter.
with Ion ScaleBuster® water conditioner



Ultrasonic BTU Meter

- Precision Matched Platinum RTD Temperature Sensors
- PT1000 temperature sensors are matched to a differential uncertainty of better than $\pm 0.18^\circ \text{ F}$
- EN1434 Compliant

Ultrasonic Water Meter

Metrological Performances

- Very low starting flow allows leakage detection
- Large measuring range
- Easy Reading
- Large LCD with good contrast
- Can be installed both horizontally and vertically



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BASI CONTROLS

DUST FREE
BREATHE THE DIFFERENCE.
Air Knight
AIR PURIFICATION SYSTEM

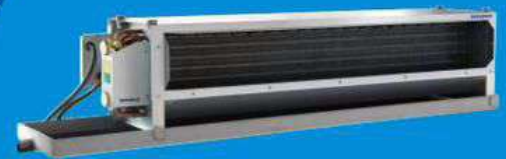


← AK-IPG
↓ AK-PTAC

- Patented Technologies
- Ionized Particles Gathering (IPG)
 - Active air scrubbers by UV energy & 5-metal quint metallic core (PX5)



SINRO®



Intelligent FCU
(with EC Motor and Energy Balancing Control Valve)



Electronically Commutated Motor (ECM)



Energy Balancing Control Valve (EBV)

OPTIMIZE AHU/PAU SYSTEM

Building & Industry

NOVENCO

YASKAWA

eNovation

THE GREEN AMBASSADORS



92%

NOVENCO ZERAX
HIGHLY EFFICIENT AXIAL FAN

x



95%

HIGHLY EFFICIENT
PM MOTOR

x



98%

YASKAWA VFD
TECHNOLOGY



=



85%

AHU Efficiency

Macau Project Reference

A casino resort aims to optimize energy consumption to reduce CO₂ emissions and cut energy costs. In the gaming hall that works 24/7, two centrifugal fans were replaced with **Novenco Zerax Fan** and **Yaskawa VFD**.

eNovation verified that the new system consumes significantly lower energy across various operating frequencies.

Running at Fixed Frequency and beyond designed Airflow

Centrifugal Fan

- 79% efficiency
- IE3 Motor used
- Star-Delta motor starter
- Belt loss and tension maintenance
- 63 decibels sound level



14.25 kW power consumption

Running at Nominal Frequency and designed Airflow

Novenco Fan

- 84% efficiency
- High-efficiency IE5 PM motor
- Yaskawa VFD
- Direct motor driven fan without belt losses
- 55 decibels sound level



4.43 kW power consumption

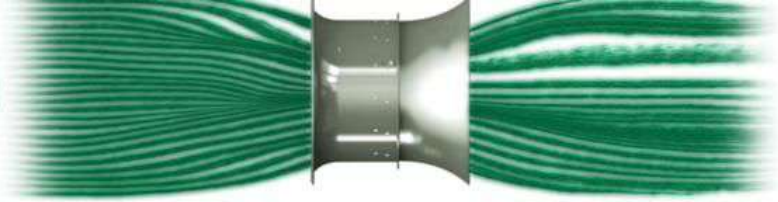


Optimized
PAU System



68% Energy Saving






Running at Maximum Operational Frequency and Airflow

Centrifugal Fan


- 56% efficiency
- IE3 Motor used
- VFD not suitable for IE5 PM motor
- Belt loss and tension maintenance
- 59 decibels sound level



 17.64 kW power consumption

Novenco Fan

- 80% efficiency
- High-efficiency IE5 PM motor
- Yaskawa VFD
- Direct motor driven fan without belt losses
- 55 decibels sound level

 9.50 kW power consumption

 **46% Energy Saving** 

Optimized **AHU** System

On-site Installation



Centrifugal Fans



Novenco Fans



—PAU—



—AHU—


2 years


2.6 years

KEY BENEFITS AND ACHIEVEMENTS

- Reduced energy consumption as high as 46 & 68%
- Reduced CO₂ by 7.65 & 9.23 kg per day
- Reduced sound level by 4 & 8 decibels
- Improved AHU & PAU efficiency by 46 & 84%
- Annual economic savings of 78,000 & 94,000 MOP
- Return on investment within 2 & 2.6 years

- Low maintenance costs (no belt, pulley or grease required)
- Attained recommended system optimization
- Beneficial to the end-user and to the environment

AHU OPTIMIZATION = CONSULTANCY + IMPLEMENTATION + DUCT MODIFICATION (Optional)

RETROFITTING OF A CENTRIFUGAL FAN AHU SYSTEM

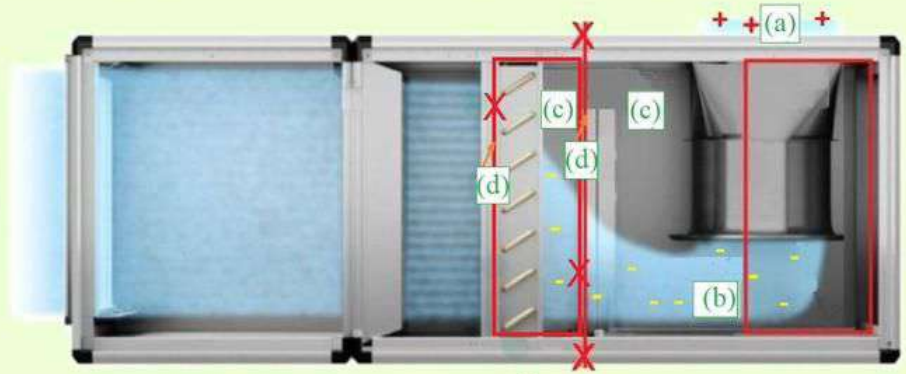
PURE COMPETENCE IN AIR

YASKAWA



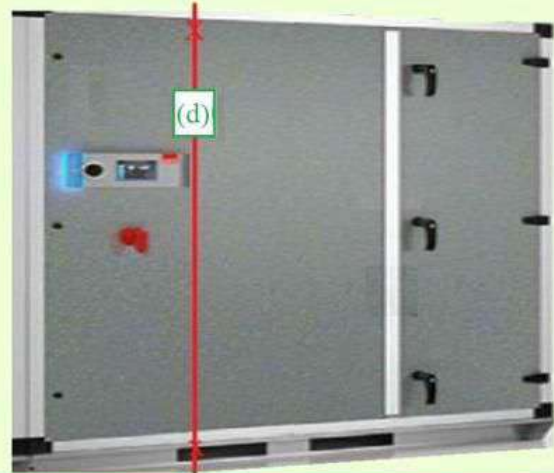
Building & Industry

NOVENCO



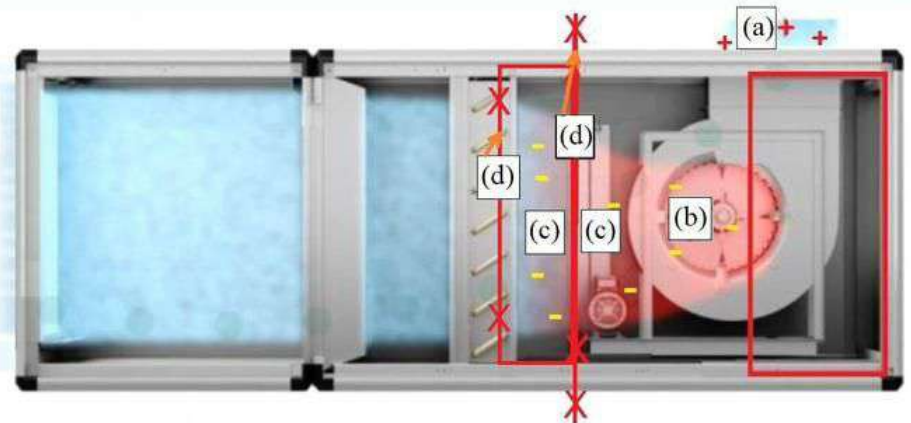
NOVENCO Fan

- Similar design to that of Centrifugal Fan (a), (b), (c), & (d)



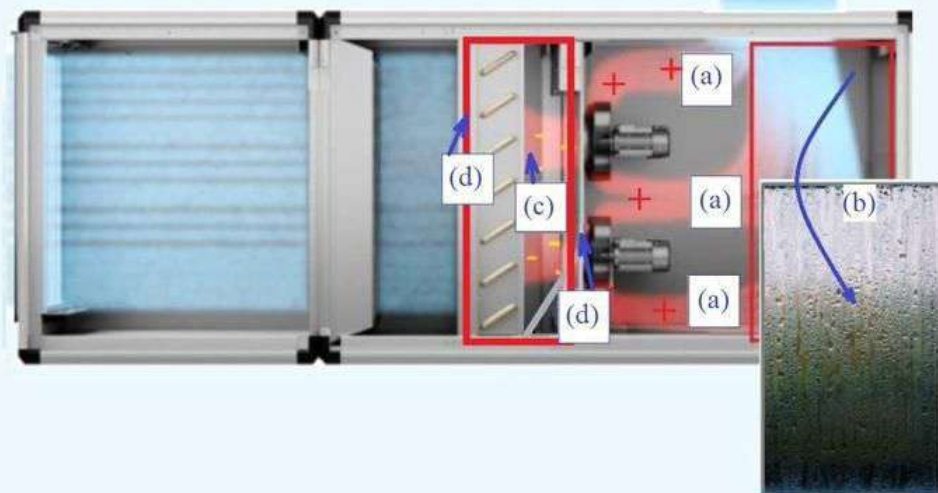
CENTRIFUGAL FAN

- Air discharged into the duct area (a)
 - * Negative pressure is within the fan area (b)
- Sufficient maintenance area (c)
- No partition panel and additional door is required (d)

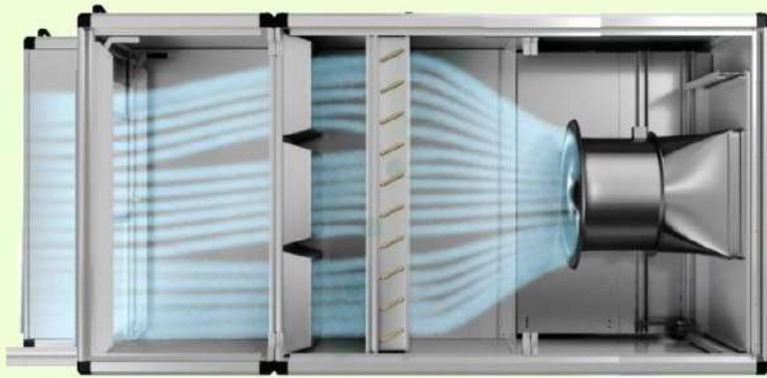


EC PLUG FAN (Array design)

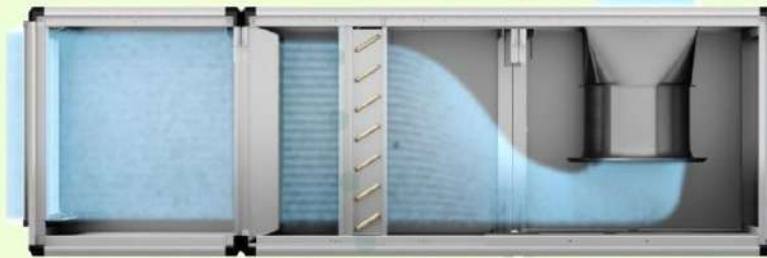
- Air discharged into the pressure partition area (a)
 - * Positive pressure is within the AHU (a)
 - * Condensation or leakage may occur at the door or walls (b)
- Limited maintenance area (c)
- Partition panel and additional door are required (d)



TYPES OF FAN IN AN AHU SYSTEM



Horizontal mounting - top view



Vertical mounting - side view

NOVENCO FAN

- Axial fan (92%)
- PM motor (95%)
- VFD (98%)

Total efficiency
= 85%



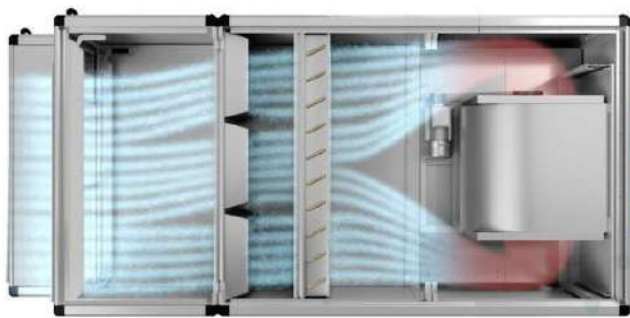
OUTCOME

- Smooth airflow
- Minimal pressure loss
- Low noise level

NOVENCO Fan
* Vane axial fan

Motor type
* Induction
* PM motor

Speed controller
* VFD



Horizontal mounting - top view

CENTRIFUGAL FAN

- Centrifugal fan (75%)
- Belt (95%) and AC motor (91%)
- VFD (98%)

Total efficiency
= 63%



Centrifugal Fan

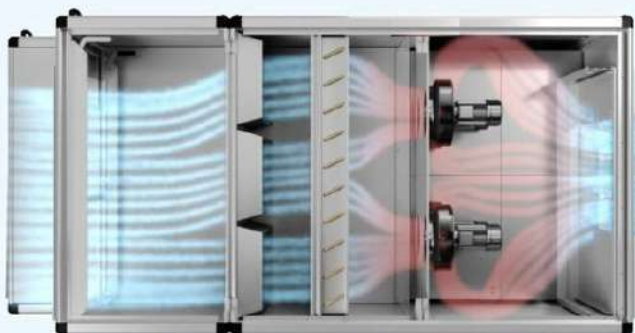
- * Forward curved
- * Backward curved
- * Backward inclined
- * Backward aerofoil inclined

Motor type **Speed controller**
* Induction * VFD



OUTCOME

- High turbulence in fan section
- Reduced efficiency
- High noise level



Horizontal mounting - top view

EC PLUG FAN (Array design)

- Plug fan (75%)
- EC motor (93%)

Total efficiency
= 70%



EC Plug Fan
* Backward curved

Motor type **Speed controller**
* EC motor * Built-in controller



OUTCOME

- High turbulence in the fan section
- Collision of airflow of the fan array
- High noise level