

SMART FFU DEDICATED OPTIONAL ACCESSORIES
智能FFU ONLINE SENSOR
專用選配件
ENVIRONMENT MONITORING MODULE
AI 環境監測模組

支援潔淨室FFU、製程設備及廠務系統趨勢監測

Support cleanroom FFU, process equipment and factory system trend monitoring



資料庫、趨勢曲線圖監測 DATABASE, SYSTEM MONITORING
TREND CHARTING AND MONITORING

溫濕度 振動 潔淨度 風量 壓力 AI IN
TEMPERATURE HUMIDITY VIBRATION CLEANLINESS AIR VOLUME PRESSURE 0~10V AI IN

數據可常時監測記錄，進行大數據分析，自動維保提示。
Track data, unlock insights, and prevent breakdowns.

TOPWELL

www.topwell-pes.com.tw

冰水機組(冷凝器結垢)的趨勢監測

Trend monitoring of ice water unit (condenser scaling)

冰水機組散熱冷卻水的標準設計水溫差為5°C，監測冰水機組電流值大小(負載高低)，同時監測冷卻水溫差。如果冰水機組處於高負荷狀態(電流滿載)，而冷卻水溫差持續減少(熱量無法釋出)，代表冷凝器結垢持續增加，當冷卻水溫差低於設定值以下時，即可顯示預先設定的“清洗冷凝器結垢警語”。此功能是可依據趨勢發展時間預測分析，可預先排定清洗冷凝器的工作時程。

The standard design temperature difference of heat dissipation cooling water is 5°C. Through our software, simultaneously monitor the ice water unit's load level and cooling water temperature difference. A decrease in temperature difference under full load indicates condenser scaling. When the temperature difference falls below 5°C, an alert can be triggered, prompting condenser cleaning. This allows for preemptive scheduling of condenser maintenance, and prevents unplanned downtime.

備註：如果冷卻水塔有搭配冷卻水溫度進行風扇節能起停運轉，亦可同時監測冷卻水塔負載，當監測條件同時滿足時才顯示警示說明。

Note: If the cooling water tower has fan energy-saving start-stop operation in conjunction with the cooling water temperature, the cooling water tower load can also be monitored at the same time. When the monitoring conditions are met at the same time, the warning instructions will be displayed.

冰水機組因低負荷而導致“冷媒液壓縮故障停機”的預防監測

Preventive monitoring of "refrigerant liquid compression failure shutdown" caused by low load of ice water unit

冰水機組最主要的故障停機原因為低負荷時因液態冷媒在蒸發器中吸收不到熱量，無法蒸發成氣態冷媒，當液態冷媒回流至壓縮機時，因液態無法壓縮而導致機組的震動，同時液態冷媒在潤滑油中吸收蒸發，使潤滑油起泡乳化，導致軸承因失油磨損故障，因此只要監測潤滑油溫度及高壓側出口溫度低於設定值以下，而且機組震動值時持續或斷續加大震幅，即可預防性停機，防止因冷媒液壓縮而導致冰水機組故障損壞。

The primary cause of icewater unit shutdown is the inability of liquid refrigerant to absorb heat in the evaporator and convert into gaseous refrigerant at low load. Since liquid refrigerant cannot be compressed, its return to the compressor induces excessive vibration. Simultaneously, the liquid refrigerant absorbs and evaporates within the lubricating oil, causing foaming and emulsification, which leads to bearing wear due to oil depletion. Therefore, as long as the lubricating oil temperature and high-pressure side outlet temperature are lower than set values, and an increase in the vibration amplitude of the unit is detected, a preventive shutdown can be performed to prevent failure and damage to the ice-water unit due to refrigerant liquid compression.

風機組、馬達、水幫浦、空壓機等動態設備的運轉維護的趨勢監測

Maintenance And Trend Monitoring Of Dynamic Equipment Such As Fan Units, Motors, Water Pumps, And Air Compressors

監測設備電流值大小(負載高低)，再依據震動值的趨勢發展時間預測分析，判斷設備是否處於不穩定的運轉狀態，如此即可提前進行預防保養工作。

By continuously monitoring equipment current (load level) and analyzing vibration trends, unstable operating states can be proactively identified, and preventive maintenance can be performed to ensure continuous equipment operations.

冷卻水塔運轉維護的趨勢監測

Trend Monitoring Of Cooling Water Tower Operation And Maintenance

冷卻水塔主要依賴風扇排氣散熱，如果冷卻水塔的震幅持續上升至設定的上限時，代表風扇的皮帶已鬆弛或軸承即將損壞，可依據趨勢發展時間預測分析，預先排定維修的工作時程。

As the cooling water tower's primary mechanism of heat dissipation, fan operation is crucial for maintaining system efficiency. Continuous monitoring of fan vibration amplitude can detect potential issues such as loose fan belts or worn bearings. By analyzing vibration trend development, maintenance tasks can be proactively scheduled.

過濾網的維護監測

Filter Maintenance And Monitoring

監測設備電流值大小(負載高低)，再依據過濾網壓差的趨勢發展時間預測分析，如此即可提前進行預防保養工作。

Monitor the current of the equipment (load level), and then predict and analyze the trend of the filter pressure difference, so that preventive maintenance can be carried out in advance.

其他廠務製程系統設備的趨勢檢測分析軟體應用需求，可委由本公司人員編輯製作。
We can also tailor the software to your specific application requirements for other devices and equipment



歷史和即時資料庫
Historical And Live Database



維修趨勢通知
Maintenance Trend Notification



數據監測記錄
Data Monitoring Records



多曲線時間軌分析
Multi-curve Time Trajectory Analysis



進階警報管理
Advanced Alert Management



上下限警報通知
Upper And Lower Limit Alarm Notifications



隨插即用 直接聯網

PLUG AND PLAY, DIRECTLY CONNECTED TO THE INTERNET

監測模組系統畫面 Monitoring Module System Screen

Saved Forecasts

- Temperature Demo 1
Last run at: 8/30/2023 16:12
Last run status: succeeded
- Temperature Demo A1
Last run at: 8/30/2023 16:12
Last run status: succeeded

Temperature Demo 1

Data source (Single source)
Source A: Temperature (1 device) View

Sampling

Sampling rate: 1 day
Sample count: 30
Minimum sample count: 30
Start time: 7/1/2023 00:00
End time: 7/31/2023 00:00
[View latest samples](#)

Forecast

Forecast sample count: 7
Training mode: Basic

Last update

At: 8/30/2023 16:12
Status: succeeded

Latest forecast result

趨勢預測線圖 Trend Forecast Line Chart
+ Add forecast

Forecast

Data source
Data source type: Single source
Source A: Differential pressure (1 device)

Sampling
Sampling rate: 8 hours
Sample count: 116
Start time: 8/1/2023 00:00
End time: Now / Custom (8/31/2023 00:00)

Forecast
Training mode: Basic
Forecast sample count: 12

Training data

參數設定 Parameter Settings
Start forecasting

Forecast

Data source
Data source type: Single source

Sampling
Sampling rate: 8 hours
Sample count: 116
Start time: 8/1/2023 00:00
End time: Now / Custom (8/31/2023 00:00)

Forecast
Training mode: Basic
Forecast sample count: 12

Select data source

The average sensor reading will be used for plotting and forecasting if multiple devices are selected.

Search:

Differential pressure
 Temperature
 Humidity
 Air volume flow rate
 Particle
 Vibration

No devices selected

Gateway #	Port number	Device ID	Available sensors	Info
192.168.1.100	1	45		詳細資訊
192.168.1.100	1	45		詳細資訊
192.168.1.100	1	1		詳細資訊

資料來源設定 Data Source Settings
Start forecasting

Forecast

Data source
Data source math: Source A - Source B
Source A: Temperature (1 device)
Source B: Temperature (1 device)

Sampling
Sampling rate: 1 hour
Sample count: 360
Start time: 8/16/2023 00:00
End time: Now / Custom (8/31/2023 00:00)

Forecast
Training mode: Basic
Forecast sample count: 1
End time: 8/31/2023 01:00

Training data

多曲線時間軌分析 Multi-curve Time Trajectory Analysis
Start forecasting

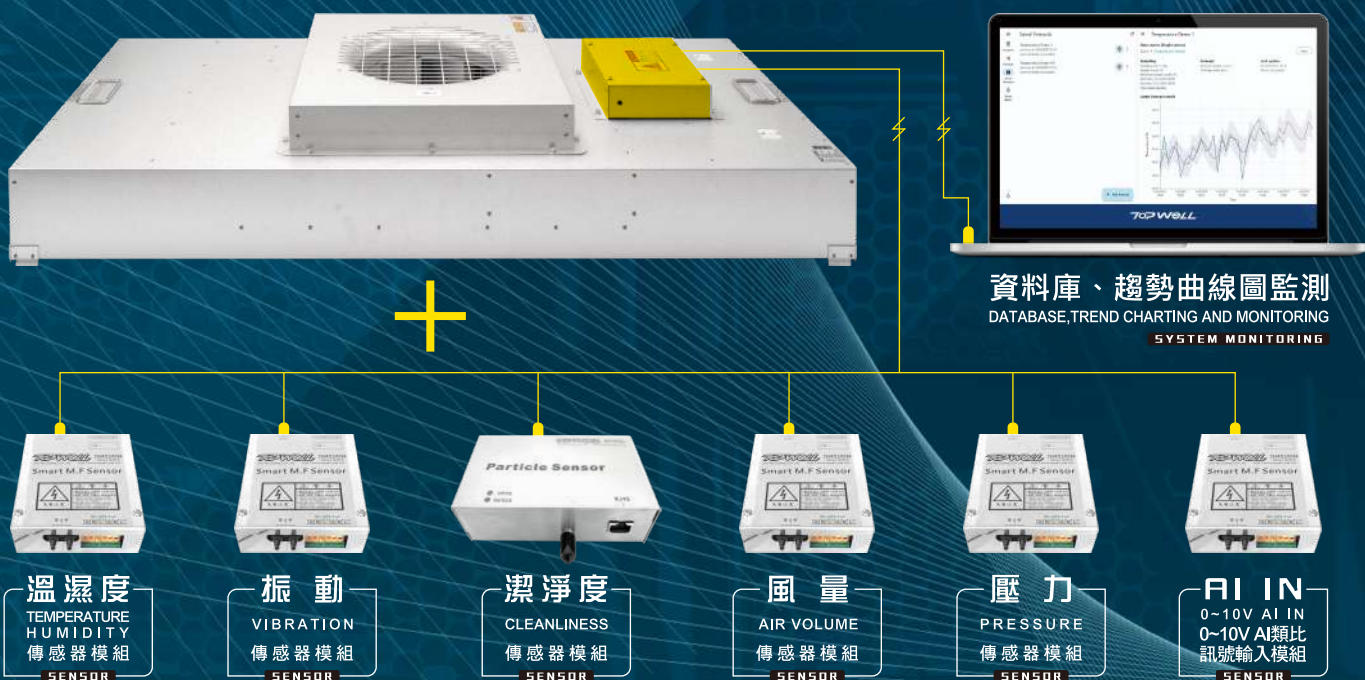
監測模組系統畫面 Monitoring Module System Screen

警報條件設定 Alarm Condition Setting Add condition

上下限設定 Upper And Lower Limit Settings

警報顯示 Alarm Display

監測模組連接範例 Monitoring Module Connection Example



ONLINE SENSOR FFU專用選配件

FFU DEDICATED SELECTION ACCESSORIES



粒子傳感器 ONLINE PARTICLE SENSOR

SPECIFICATION	工作電源 Working power supply : DC 24V
	通訊 Communication : Modbus RTU , RJ45X1
	量測範圍 Measuring range : 0.3~0.5um , 0~1000000 pcs / cf ³



通訊型壓差傳感器±25Pa COMMUNICATION DIFFERENTIAL PRESSURE SENSOR ± 25Pa

SPECIFICATION	工作電源 Working power supply : AC208~277V
	通訊 Communication : Modbus RTU , RJ45X2
	量測範圍 Measuring range : ± 25Pa(±3%) (適用量測室內環境 / Suitable for measuring indoor environment)



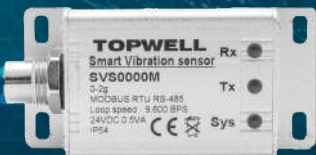
通訊型壓差傳感器 500Pa COMMUNICATION DIFFERENTIAL PRESSURE SENSOR 500Pa

SPECIFICATION	工作電源 Working power supply : AC208~277V
	通訊 Communication : Modbus RTU , RJ45X2
	量測範圍 Measuring range : 500Pa(±3%) (適用量測FFU整機靜壓 / Suitable for measuring static pressure of FFU complete machine)



通訊型溫溼度傳感器 COMMUNICATION TEMPERATURE AND HUMIDITY SENSOR

SPECIFICATION	工作電源 Working power supply : AC208~277V
	通訊 Communication : Modbus RTU , RJ45X2
	量測範圍 Measuring range : 0~50°C(±0.3°C) , 0~100%(±2%)



震動傳感器 SHOCK SENSOR

SPECIFICATION	工作電源 Working power supply : AC208~277V
	通訊 Communication : Modbus RTU , RJ45X2
	量測範圍 Measuring range : 0~9999um / 1Khz

各類連網模組可委由本公司協同開發

Various Networking Modules Can Be Developed Collaboratively By Our Company



智能FFU ONLINE SENSOR 專用選配件



AI環境監測模組

SMART FFU DEDICATED OPTIONAL ACCESSORIES
AI ENVIRONMENT MONITORING MODULE

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