KBFC - KITE DEX - KITE

高效空氣冷卻 EFFICIENT AIR COOLING



INNOVATIVE TECHNOLOGIES FOR BLOWN FILM COOLING

吹膜冷卻的創新技術

PERFORMANCE AND RELIABILITY

Bubble film extrusion plants are part of those complex plant applications that require not only different fluids, but also different temperatures.
The quantity and quality of the film produced depends, for example, largely on the cooling of the external ring of the bubble (OBC) and the internal cooling system (IBC).
The air handling is decisive in the definition of the aesthetic and mechanical characteristics of the film, as well as in the optimization of the hourly production capacity of the line.
Next to the ring, other extrusion line utilities require water at different temperatures: electric switchboards or containers prefer lower temperatures; instead, for winders, tows, vents and motors, it is suggested to avoid the effect of condensation.

With the implementation of more performing lines and the using of increasingly complex or expensive materials, it is necessary to maintain constant and reliable production parameters.
The prerogative is to use new materials even when the environmental or process conditions face significant changes, for example in different seasons or in the countless climatic areas in the world. Since many years now, Frigosystem has been investing in this sector, where it enjoys a leading role in the configuration of high efficiency systems, appreciated both by final processors and manufacturers of extrusion lines.
It is actually the continuous and interactive collaboration with global experts of this process that has led Frigosystem to be the most professional and innovative partner in this sector.
Frigosystem is actually able to offer an excellent solution for each specific case, taking into consideration every factor that affects the result and performance of the system in its entirety.

性能和可靠性

吹膜擠出生產線屬於那些複雜的工廠應用之一，不僅需要處理不同的流體，還需應對不同的溫度條件。
例如，所生產薄膜的產量與品質，在很大程度上取決於氣泡外環（OBC）的冷卻以及內部冷卻系統（IBC）的運作。
氣流處理對於定義薄膜的美學與機械特性，以及優化生產線的每小時產能至關重要。
除了環形機之外，擠出生產線上的其他輔助設備也需要不同溫度的水：配電盤或容器較適合較低的水溫；至於收卷機、牽引機、排氣裝置和馬達，則建議避免冷凝現象的影響。

隨著更多高效能生產線的導入，以及日益複雜或昂貴的材料被廣泛採用，維持穩定且可靠的生產參數已成為必要之舉。
其優勢在於即使面臨環境或製程條件的顯著變化——例如不同季節或全球不同氣候區——仍能運用新材料。多年來，Frigosystem 持續投資於此領域，並在高效能系統的配置方面居於領先地位，其技術不僅深受終端加工商青睞，亦獲得擠出生產線製造商的認可。
事實上，正是透過與全球專家在此過程中持續且互動的協作，才使 Frigosystem 成為該領域中最專業且最具創新力的合作夥伴。
Frigosystem 實際上能夠針對每種具體情況提供卓越的解決方案，並將所有影響系統整體結果與效能的因素皆納入考量。

INDUSTRIAL APPLICATIONS












KBFC

As for air cooling, the customer can mainly choose between three plant concepts: KBFC, KITE DEX, KITE

KBFC is a water/air exchanger to be connected to an existing and separate chilled water source. The combination with Frigosystems high efficiency chillers is optimal.

空氣冷卻方面，客戶主要可從以下三種設備設計方案中進行選擇：KBFC、KITE DEX、KITE

KBFC 是一款水/空氣熱交換器，需連接至現有且獨立的冷水來源。與 Frigosystems 高效率冷水機組搭配使用效果最佳。.

KBFC

- Air Flow 250 - 30000 m³/h
- Water - Air heat exchanger with droplet separator
- PID regulation ±0,4°C
- Plug & Play



SEMPLIFIED LOGISTIC

KBFC water/air batteries are designed to be installed on top of each other, in order to contain the footprints on the ground that, in modern industrial sites, are increasingly small and expensive.

節省地面佔用空間

KBFC水/空氣熱交換器的設計可堆疊安裝，藉此節省地面佔用空間——在現代工業園區中，這類空間不僅日益稀缺，成本也日益高昂。.







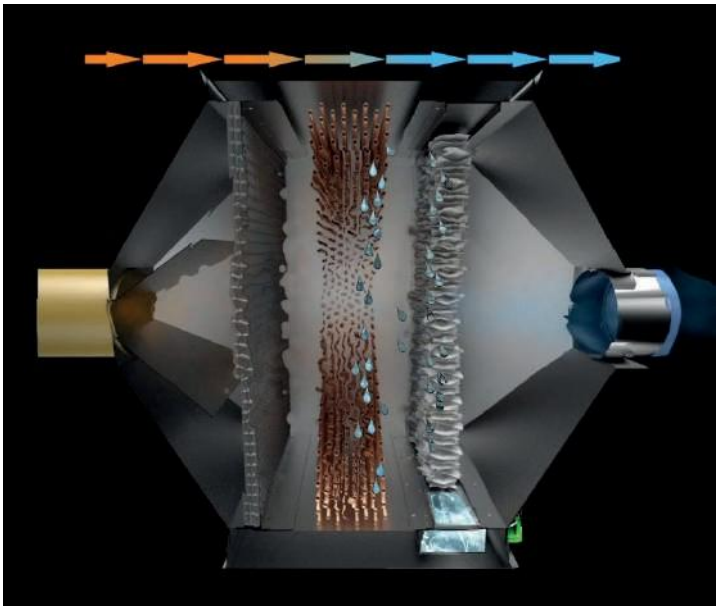
INSIDE VIEW

WATER - AIR HEAT EXCHANGER

Large surface water/air exchanger.
All parts in contact with the process air are made of stainless steel. Completely insulated channel and free from thermal inefficiencies.
Complete with air filter in the battery.

水-空氣熱交換

大面積水/空氣熱交換器。
所有與工藝空氣接觸的部件均由不鏽鋼製成。通道完全絕熱，無熱能損耗。
熱交換器內已配備空氣過濾器。



DROPLET SEPARATOR

Installed on each battery. The width of the separator allows to remove ambient humidity up to 90%. The trapped drops are collected in a stainless-steel tray and conveyed to the drain.
The reduction of humidity allows to maintain constant line speeds and optimal air temperatures even in sites with high ambient humidity, or in technical applications where the required air temperature is particularly low and therefore creates important amount of condensation in the bubble.
Temperature is controlled by constant modulation with three-way valve. Very high precision through PID electronic controller.

液滴分離器

安裝於每個熱交換器上。隔板的寬度可去除高達 90% 的環境濕度。被截留的水滴會收集於不鏽鋼托盤中，並輸送至排水口。
降低濕度有助於維持恆定的生產線速度及最佳氣溫，即使在環境濕度較高的場所，或是技術應用中——當所需氣溫特別低，因而導致氣泡內產生大量冷凝水時——亦能維持此狀態。溫度透過三通閥進行恆定調控。藉由 PID 電子控制器實現極高精度。



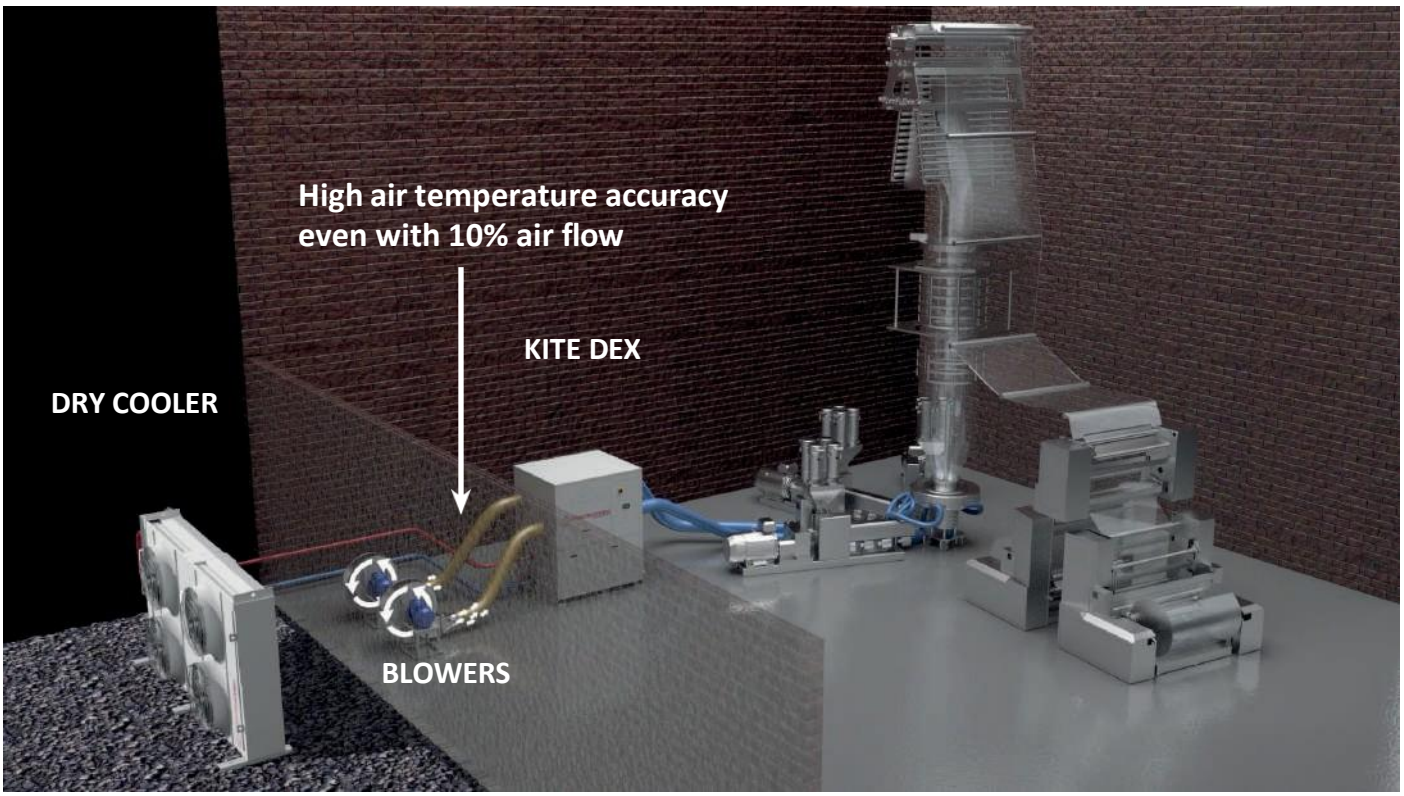
KITE & KITE DEX

The products of the KITE series provide efficiency and result with:

- Constantly maintaining parameters of production
- Increase in final product quality and hourly production
- Lower energy consumption
- Possibility of air cooling to low temperatures
- Control of the air temperature with a tolerance of 0.5 ºC
- Wide possibility of use with different airflow and air temperatures
- Wide possibility of use with different water flows and water temperatures
- Limited consumption of condensation water
- Possibility of supervision

KITE 系列的產品具備高效能且成效顯著，其特點包括:

- 持續維持生產參數
- 提升最終產品品質與每小時產量
- 降低能源消耗
- 可以將空氣冷卻至低溫
- 空氣溫度控制，容差為±0,5 C°
- 適用範圍廣泛，可因應不同的氣流與氣溫
- 適用範圍廣泛，可因應不同的水流與水溫
- 有限的冷凝水消耗量限
- 監督的可能性



KITE DEX

KITE DEX is a developed cooling system for ring air only (single or double) and IBC.

KITE DEX 是一款專為風環（單環或雙環）及 IBC 設計的冷卻系統。

KITE DEX

- Plug & Play
- Refrigerant Gas R410A
- Water - Air heat exchanger with droplet separator
- Water Cooled
- Hermetic Scroll Compressors
- Free Cooling
- Capacity 15 - 220 kW
- Air Flow 1000 - 11000 m³/h
- Max condensation water T 45°C (113°F)



KITE

KITE is the solution “ALL IN ONE”, it is a mono-block solution where, in the same unit, there are:

- ring cooling (single or double), IBC and gauge control
- thermoregulated water between 7 and 25 ºC to extruder, torque motors, drawing device and other utilities.

With this solution, installation and connection costs, floor space and maintenance costs are significantly reduced. Energy consumption is also optimised.

KITE 是一款「全功能一體化」的單體式解決方案，將所有核心功能整合於單一設備之中，同一台設備中包含：

- 環形冷卻(單環或雙環)、IBC及壓力表控制
- 將溫度控制在 7 至 25 °C 之間的恆溫水，供應至擠出機、扭力馬達、拉伸裝置及其他輔助設備。

採用此解決方案，可大幅降低安裝與連接成本、佔地面積及維護成本，同時也能優化能源消耗。

KITE

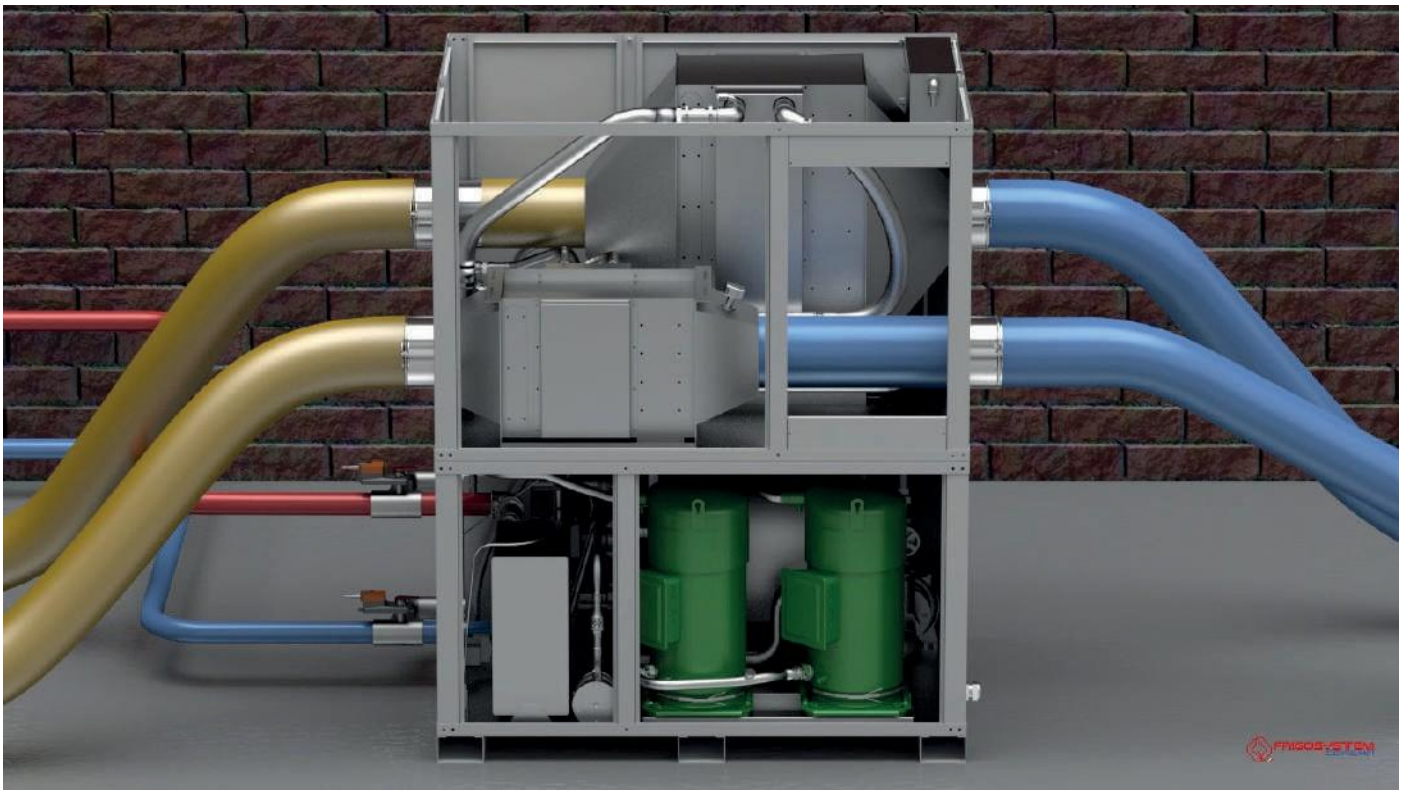
- Plug & Play
- Refrigerant Gas R410A
- Water - Air heat exchanger with droplet separator
- Water Cooled
- Hermetic Scroll Compressors
- Free Cooling
- Capacity 48 - 85 kW
- Air Flow 1000 - 5500 m³/h
- Max condensation water T 40°C (104°F)
- Hydronic Group UTR



INSIDE VIEW

COMPRESSORS Scroll with structural characteristics of higher efficiency, compactness and silence.
The majority of KITE and KITE DEX chillers are multi-compressor units, which allow the continuous performance of the production line even in case of maintenance.

壓縮機 渦旋式壓縮機的結構設計，讓它不僅效率更高，而且體積緊湊、運轉時也更安靜。
大多數 KITE 和 KITE DEX均採用多壓縮機設計，即使進行維護，也能確保生產線持續運作。



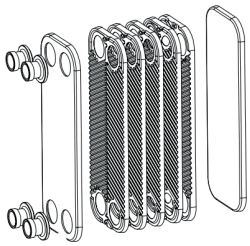
ENVIRONMENTAL SUSTAINABILITY 環境永續性

The gains in efficiency come from the innovative and eco-friendly gas, named R410A.
Relevant for thermal conductivity, R410A, combined with the preferred choice of scroll compressors and electronic controls, significantly reduces the energy consumption and, accordingly, CO2 emissions.
The use of R410A gas allows to have a Coefficient of Performance (COP) considerably higher than other gases commonly used in air refrigeration.
Available worldwide, this gas also allows to operate in an extended range of ambient temperatures.

效率的提升源自一種創新且環保的冷媒—R410A。.
就熱導率而言，R410A 冷媒搭配首選的渦旋式壓縮機與電子控制系統，能顯著降低能源消耗，進而減少二氧化碳排放量。
使用 R410A 冷媒，可使性能係數（COP）遠高於空氣製冷系統中常見的其他冷媒。
此種氣體在全球各地均有供應，且可在更寬廣的環境溫度範圍內運作。

CONDENSER

Large surface water condenser always rotected by a suitable filtration device.
The condenser can receive condensing water up to 45 ºC.
This allows to operate with dry condensation batteries (dry cooler) even in places with high ambient temperatures and avoid, in this way, the wasting consumption of water and energy that impose other manufacturers, with limitation of the condensing temperature sometimes even under 30 ºC.



冷凝器

大面積水冷式冷凝器須始終配備適當的過濾裝置，以提供保護。冷凝器可接收最高達 45 ºC 的冷凝水。

這使得即使在環境溫度較高的場所，也能使用乾式冷凝電池（乾式冷卻器）進行運作，從而避免了類似其他製造商所造成的浪費性用水與能源消耗——這些製造商的冷凝溫度限制有時甚至低於 30 ºC。



TANK stainless steel tank completely insulated.
After specific technical evaluations, Frigosystem has chosen to operate in this sector with indirect exchange systems.
The use of a tank offers countless performance advantages.
First of all, there is the opportunity to manage the temperature with air flows between 0% and 100% with extreme precision. The chiller adapts quickly and in a flexible way to production variables, including the environment in which it is placed.
Compressors are always protected and the evaporator is not exposed to frost risks.

The tank can be dimensionally adapted and allows the bleed water required for the extrusion line.
Frigosystem customizes the configurations according to the specifications of the manufacturers of the lines.

TANK 不鏽鋼儲槽，完全隔熱。
經過詳細的技術評估後，Frigosystem決定在該領域採用間接熱交換系統。
使用儲槽能帶來無數的性能優勢。

首先，該系統能透過 0% 至 100% 的氣流精準控制溫度。冷水機可迅速且靈活地適應各種生產變因，包括其所處的環境。壓縮機始終受到保護，且蒸發器不會面臨結霜的風險。

該儲槽可依尺寸進行調整，並能提供擠出生產線所需的排污用水。Frigosystem會根據生產線製造商的規格要求，量身訂製相關配置。



FREE COOLING

The maximum energy efficiency comes from the possibility to integrate KITE and KITE DEX with free cooling by exploiting the ambient conditions when 5 ºC lower compared to the set point configured: in this case, **the unit automatically stops the compressors** and decreases the energy consumption of 100%.

In intermediate situations, the electronic intelligence of the system allows to partial the using of compressors with the source of condensation always present.

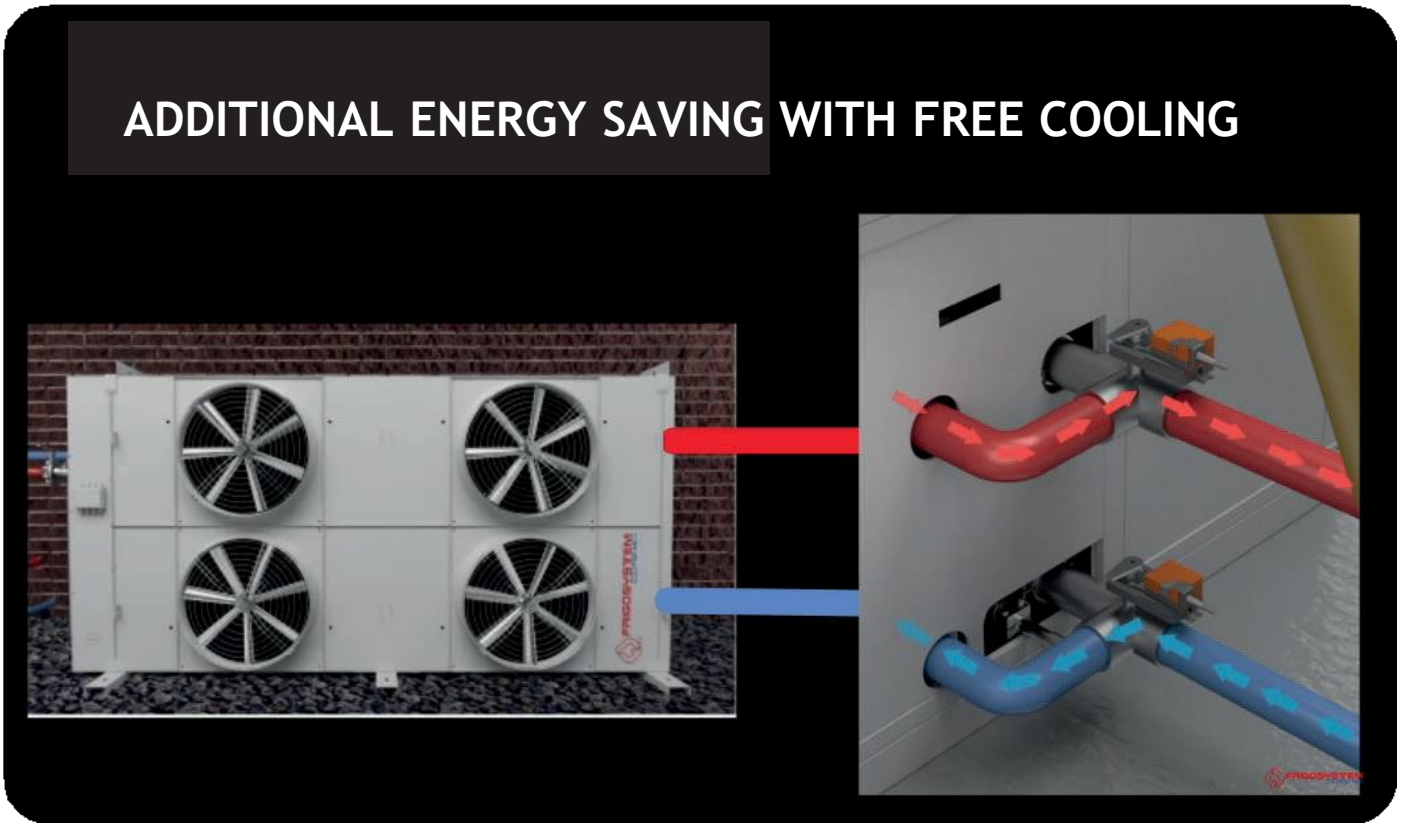
In this way, the **pay-back** of the investment is very fast: in the bubble film market, the KITE and KITE DEX chillers with integrated freecooling are the cooling systems with the highest energy-saving.
This option, moreover, has no footprint on the ground, does not require adjustments of the plant and does not deteriorate the maintenance.

最高能源效率源自於能將 KITE 和 KITE DEX 與自由冷卻功能整合，藉此利用環境溫度較設定點低 5 °C 時的情況：在此情況下，機組會自動停止壓縮機運轉，並將能耗降低 100%。

在中間狀態下，系統的電子智慧功能可讓壓縮機以部分負載運作，同時冷凝源始終保持運作。

因此，這項投資的回本速度非常快：在押出中空吹膜市場中，配備整合式自由冷卻功能的 KITE 和 KITE DEX 冷水機，是節能效果最佳的冷卻系統。
此外，此方案不會佔用地面空間，無需調整廠房，也不會增加維護負擔。

ADDITIONAL ENERGY SAVING WITH FREE COOLING



SUPERVISION & CONNECTIVITY.

Frigosystem's electronic controllers of the KITE have an excellent connectivity to other units. Their program flexibility can match with the most demanding applications and grant a perfect local and remote control, thanks to the high-performance connectivity module FS i-LINK.

監督與連通性

Frigosystem 的 KITE 系列電子控制器具備卓越的連通性，可與其他設備無縫整合。憑藉其程式設計的靈活性，即使面對最嚴苛的應用需求也能游刃有餘；加上配備高效能的FS i-LINK 連通模組，更能提供完美的本地與遠端控制功能。

遠端管理
TELEMANAGEMENT
Unit control from any WEB position
可從任何網路位置進行控制

服務
SERVICE
Real time support
及時支援

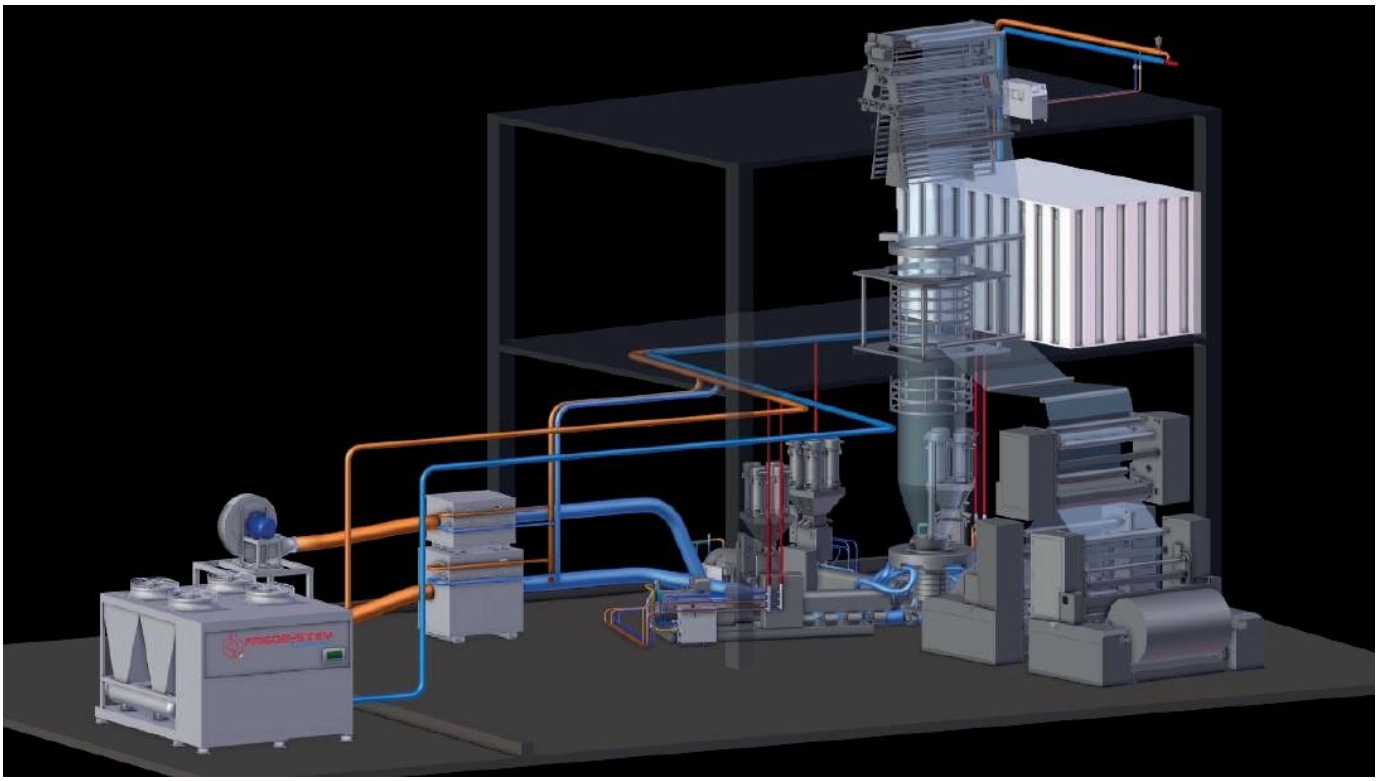
維護
MAINTENANCE
Guide for the correct plant functioning
設備正常運作指南

稅務減免
TAX RELIEF
Incentives for digital transformation
數位轉型激勵措施

系統介接
INTERFACING
With other systems
與其他系統

An intuitive, functional and user-friendly interface is supported by a wide backlit graphic display equipped with several multifunctional keys.
The available communication protocols allow the chillers to interact with the main PLCs of the extrusion lines and control, from a single device, the entire cooling system.

直觀、實用且易於操作的介面，搭配寬大的背光圖形顯示幕，並配備多個多功能按鍵。
透過現有的通訊協定，冷卻機可與擠出產線的主PLC進行互動，並透過單一裝置控制整個冷卻系統。





EASY INSTALLATION AND MAINTENANCE

Compact and complete units: with simple electrical and hydraulic connections, units can be put into operation very quickly.

Quick access: all components are allocated inside the unit to be reached by the maintenance operator with maximum convenience and ease of operation

Refrigerant circuit: designed for periodic checks in accordance with current regulations.
Frigosystem completes its offer to customers with after-sales contracts and assistance, taking charge of periodic and extraordinary maintenance of the units.

Advanced control software: which makes it possible to monitor operating parameters and identify any anomalies, even remotely, with special tools and remote assistance contracts.

安裝和維護簡便

結構緊湊且功能齊全的機組: 憑藉簡便的電氣與液壓連接，機組可迅速投入運作。

快速取用: 所有組件均配置於機體內部，以便維護人員能以最便利且易於操作的方式進行操作。

製冷迴路: 設計用於根據現行法規進行定期檢查。Frigosystem透過提供售後服務合約與技術支援，完善其對客戶的服務內容，並負責設備定期及特殊維護。

進階控制軟體: 這使得即使透過特殊工具和遠端支援合約，也能遠端監控運作參數並偵測任何異常情況。.



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