SiNTRA

CROSS
Advanced
Temperature
Control



Move less air.
Control more space.

Precision climate control for large volume buildings.

SINTRA

CROSS
Advanced
Temperature
Control

Rethink air.

Heating, cooling and ventilating large-volume buildings has traditionally required compromise.

Oversized AHUs, extensive ductwork and high air volumes increase plant requirements, fan energy and operating costs.

Yet temperature variation, stratification and uncomfortable draughts can remain.

SINTRA redefines large-volume building climate control.

Leveraging its unique, patented technology, SINTRA relies solely on primary supply air to induce controlled volumetric mixing, eliminating stratification and ensuring a draught-free, uniform temperature profile within large-volume buildings.



Control every cubic metre.

The conventional approach

Large-volume HVAC systems typically rely on substantial primary airflow, larger AHUs and extensive ductwork to distribute conditioned air throughout the space.

In high-volume buildings, this can increase fan energy and contribute to stratification, temperature variation and localised draughts.

Control through volumetric air movement

Unlike conventional diffusion systems, SINTRA achieves precise thermal control using significantly lower primary airflow.

By inducing the entire air volume into controlled, continuous movement, SINTRA maintains a uniform temperature profile throughout the space.

This reduces stratification, hot and cold spots and uncomfortable draughts, while lowering fan energy, plant demand and operating costs.

SINTRA

Uniphar, Dublin
48,124m²
Temperature-controlled warehousing.

CROSS
Advanced Temperature Control



Precision at any scale.

SINTRA brings precise temperature control to large-volume buildings across a wide range of applications.

From pharmaceutical facilities and temperature-sensitive storage to manufacturing, theatres and studios, each system is designed around the building volume, layout and required environmental conditions.









Precision without complexity.

Conventional HVAC

Conventional HVAC systems typically rely on high volumes of conditioned air, extensive ductwork and larger air handling plant to maintain conditions across large spaces.

As building volume increases, this can increase fan energy and plant requirements, while making temperature stratification, hot and cold spots and localised draughts harder to control.

The SINTRA approach

SINTRA takes a different approach. By controlling the entire air volume with significantly less primary airflow, the system reduces the plant, ductwork and energy required to maintain stable conditions.

The result is greater temperature uniformity, fewer draughts and consistent comfort throughout the occupied space, with lower fan energy and operating costs.

±1°C
temperature accuracy

Maintains precise temperature control across large-volume spaces, from occupied environments to temperature-sensitive storage.

40m+
high-bay control

Maintains consistent temperatures vertically and horizontally, including spaces with ceiling heights of 40m and above.

Draught-free
circulation

Controlled air velocity at occupied level maintains comfortable conditions without disruptive draughts

No return
air ductwork

Eliminates conventional return-air duct networks, reducing ductwork, fan pressure losses and ceiling loads.

Up to 70%
fan energy reduction

Lower primary airflow reduces electrical fan power while maintaining environmental conditions.

Project-specific
airflow design

Each system is engineered around the building geometry, use, racking, automation and other internal constraints.

Loading-bay
airflow control

Variwind® creates a controlled air barrier across open loading-bay doors, reducing cold air ingress and heat loss.

Proven
across sectors

Applied across aerospace, automotive, pharmaceuticals, logistics, manufacturing, sports and public environments.

SINTRA

Vicenza Convention Centre, Italy
14,500m2
Exhibition space.

CROSS
Advanced
Temperature
Control

Chosen by architects.
Specified by engineers.

SINTRA integrates into large architectural spaces with minimal visual impact, giving designers greater freedom while meeting demanding environmental requirements.

Its boost function provides rapid response when conditions need to change. PULSERS® then maintain slow, continuous air movement throughout the space, delivering uniform temperatures, draught-free comfort and low fan energy.

SINTRA AIRBUS

Airbus manufacturing facility, Nantes, France
19,000m²
Clean-room
manufacturing halls

CROSS
Advanced
Temperature
Control



Same building, different thinking.

At Airbus Nantes, two identical 19,000 m² manufacturing halls provided a rare opportunity to compare SINTRA directly with conventional HVAC under operating conditions.

With identical 15-metre ceiling heights, one building uses traditional ducted HVAC while the other uses SINTRA, allowing direct side-by-side measurement of airflow, fan power, stratification, ductwork and filter consumption.

Direct performance comparison

The measured results demonstrate the difference in airflow demand, fan power, temperature stratification, ductwork and filter consumption under comparable operating conditions.

Traditional system		SINTRA Pulsion® system		Result
Airflow	340,000m³/h	**Airflow**	150,000m³/h	**-55%**
Electrical fan power	300 kW	**Electrical fan power**	90 kW	**-70%**
Max stratification	2.0°C	**Max stratification**	0.8°C	**-60%**
Total duct length	704m	**Total duct length**	159m	**-545m**
Return duct length	400m	**Return duct length**	0m	**-400m**
Filter consumption	Baseline	**Filter consumption**	70% reduction	**-70%**

Jaguar Land Rover
SINTRA Modulair operating alongside SINTRA Pulsion® to provide additional comfort and environmental control.

Advanced Temperature Control

SINTRA Modulair.

Reduce cooling demand through controlled ventilation.

Mechanical cooling in large industrial buildings can require substantial plant, energy and capital investment.

SINTRA Modulair provides an alternative approach where comfort ventilation can maintain the required internal conditions. Working with SINTRA Pulsion®, it uses controlled air movement and outside air to reduce cooling demand and energy consumption.

Reduce daytime cooling demand
Night purge ventilation uses cooler outside air to reduce heat stored within the building fabric, lowering cooling demand during daytime operation.

Support indoor air quality
High-volume air exchange introduces fresh outside air while removing heat, stale air and process-related airborne contaminants.

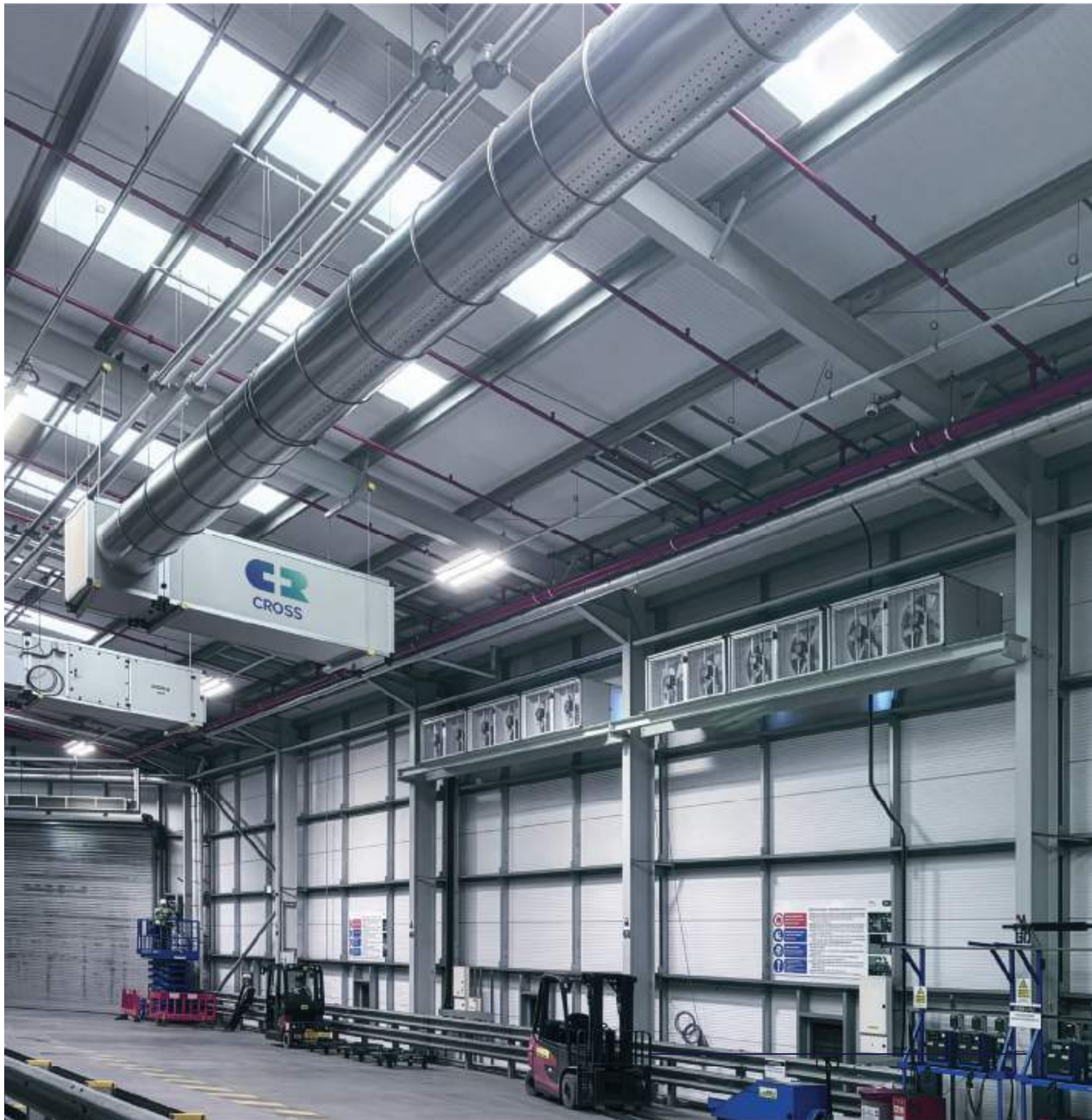
Control temperature stratification
Working with SINTRA Pulsion®, Modulair reduces temperature stratification in high-bay buildings, maintaining more consistent conditions throughout the occupied space.

Delivered benefits

Proven in demanding climates
Field-tested in high ambient temperatures across southern Europe.

Lower capital and operating costs
Reduces reliance on energy-intensive mechanical cooling, helping lower plant requirements and ongoing energy costs.

Lower energy demand
Uses outside air and controlled air movement to maintain comfortable working conditions with reduced cooling energy.



Stellantis
Variwind® loading-bay airflow control operating as part of the wider SINTRA system.

Advanced Temperature Control

SINTRA Variwind® loading bay airflow control.



Keep the door open. Keep the climate in.

Open loading-bay doors can create significant heat loss in industrial buildings. Cold outside air enters at low level while warm internal air escapes, increasing heating demand and disrupting conditions within the building.

Conventional air curtains typically use heated air to limit cold air ingress.

SINTRA Variwind® takes a different approach.

Using untreated outside air, Variwind® creates a controlled air barrier across the open doorway, limiting cold air ingress before it enters the building.

By reducing cold air ingress, Variwind® helps maintain stable internal temperatures, reduces heating demand and supports consistent conditions around busy loading areas.

Fruit ripening chambers
Each chamber can be independently controlled for temperature, humidity and atmospheric gases, allowing operators to manage ripening in line with stock levels and demand.

Advanced Temperature Control

SINTRA Cross Ripe®. Every pallet. The same result.

Fruit ripening is one of the most critical stages in the fresh produce supply chain. Inconsistent environmental conditions can lead to variations in colour and quality, reduced shelf life and increased product loss.

SINTRA Cross Ripe® maintains precise, uniform conditions throughout the ripening chamber, helping fruit reach the required colour, texture and flavour consistently across every pallet.

This level of control gives operators greater confidence when planning ripening cycles, dispatch and distribution, while helping reduce spoilage and rejects.

Operational benefits

±0.1°C temperature control across the chamber

Consistent colour and texture across every pallet

Reduced product loss and spoilage

Extended shelf life

Reliable scheduling for dispatch and retail supply

Cross Ripe® turns a variable process into a controlled, repeatable operation.



Don’t throw the air. Move the room.

The technology: MIX-IND® & PULSERS®

Conventional air diffusion distributes conditioned air by projecting it into the space. In large-volume buildings, this can require substantial primary airflow and contribute to draughts and temperature stratification.

SINTRA takes a different approach. Patented MIX-IND® technology uses PULSERS® to induce controlled movement of the entire air mass, using significantly less primary supply air.

This principle, known as air pulsion, creates continuous volumetric mixing throughout the space, maintaining stable temperatures with low air velocities at occupied level.

Engineered for each space
MIX-IND® technology requires a different approach to conventional duct layouts. PULSER® location and orientation are calculated around the building geometry, use and environmental requirements to achieve the required airflow and temperature performance.

SINTRA assisted design
CROSS and SINTRA work alongside your project team to develop the system around the building, its use and required performance.

Our application engineers support system configuration, PULSER® positioning and technical validation before installation.

Airflow modelling
PULSER® positioning is calculated to achieve effective entrainment and minimise dead zones.

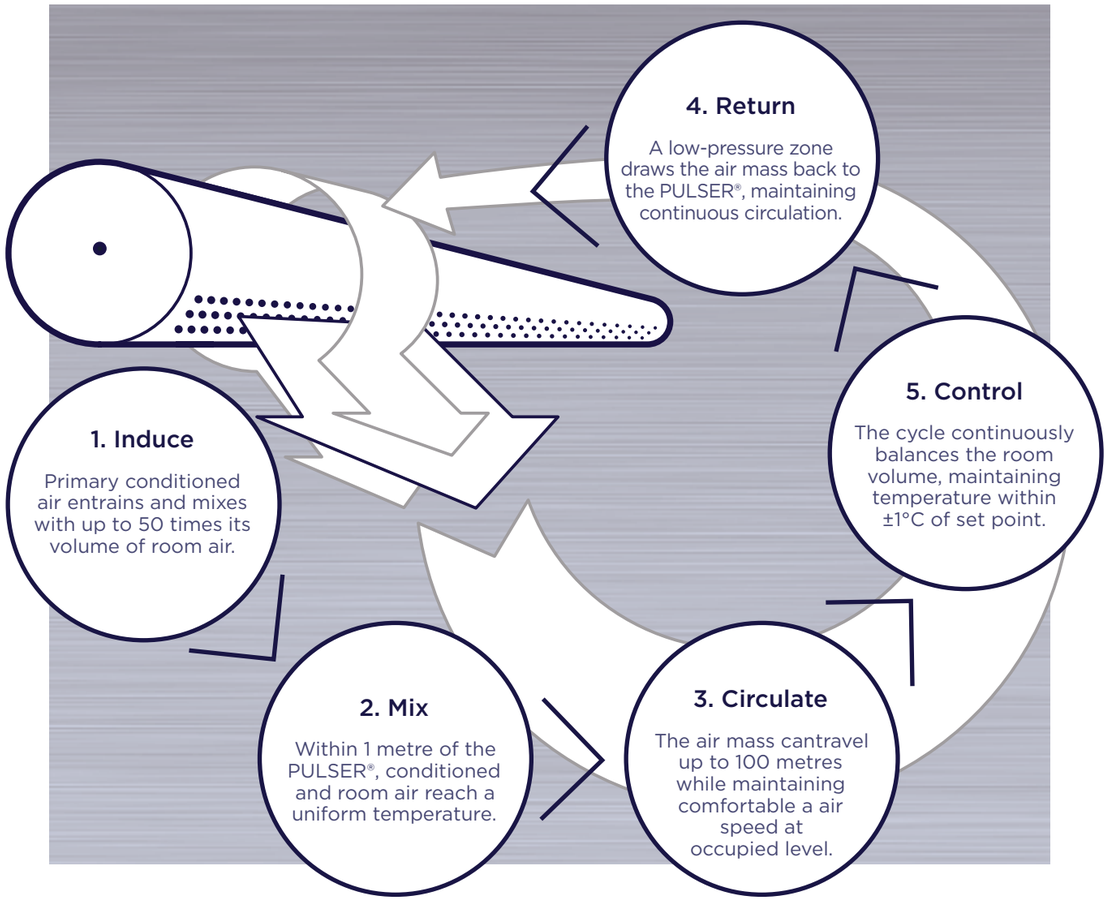
Architectural integration
System layouts account for structure, crane tracks, racking, automation and other site constraints.

Commercial efficiency
System design balances required performance, plant requirements and capital cost.

Technical validation
Application engineers validate the proposed design against agreed project requirements.

The SINTRA cycle.

The technology: MIX-IND® & PULSERS



MIX-IND® & PULSERS® technology
Once the room air mass is in motion, SINTRA Pulsion® maintains continuous circulation with low energy demand. Primary and Secondary PULSERS® can be configured to suit the building volume, layout and required environmental conditions.



Built on air science.

35 years of research, testing and fluid dynamics.

The SINTRA Expertise & Technology Centre is dedicated to the research, testing and developmentof air treatment systems for large-volume buildings.

Physical test data is continuously compared with fluid-dynamic calculations, helping SINTRA validate performance, refine its digital models and develop the next generation of MIX-IND® systems.

Performance. Measured.

Thermal accuracy



Up to ±0.5°C in clean-room applications

Eliminates hot/cold zones vertically and horizontally.

Ceiling height



40+ metres ceiling height

Total destratification without auxiliary roof fans.

Air throw



Up to 100 metres effective range

Minimises total required duct runs across vast spans.

Fan energy savings



Up to 70% reduction

Drastically lowers electrical power consumption.

Airflow volume demand



Up to 55% reduction

Reduces required AHU plant sizing and duct work.

Filter consumables



Up to 70% savings

More efficient filter usage, and extended life due to lower AHU air volume.

Low Noise Performance	Suitable for noise-sensitive environments, including studios and cinemas, with applications designed to NR25.
Volumetric air entrainment	Complete air mixing occurs within 1 metre of the PULSER® duct surface.
Variable airflow	10% to 100% via AHU fan control, without loss of temperature stability or system performance.
Low-temperature free cooling	Outside air down to -15°C can be introduced directly into high internal-heat environments without condensation risk or occupant draughts.
No return air ductwork	Operates without return-air duct networks, reducing fan static pressure losses and structural ceiling loads.
Clean-room compliance	Suitable for controlled environments up to ISO Class 8 clean-room standards.

15,000+

Installations worldwide

SINTRA MIX-IND® systems installed across industrial, commercial and logistics applications.

35 Years

Research and development

Thermodynamic research, physical testing and continued field validation.

SINTRA

CROSS
Advanced
Temperature
Control



Precision you can’t feel.

Badminton is highly sensitive to air movement. Even small variations in airflow can affect the trajectory of the shuttle, making precise environmental control essential at competition level.

For this Olympic venue, SINTRA maintained precise environmental conditions while keeping air movement at court level low enough to avoid affecting play.

CROSS

Designed for the space.
Engineered for the outcome.

CROSS Advanced Temperature Control is the exclusive supplier of SINTRA systems across the UK and Ireland, with support for projects in North America and Australia.

From industrial and manufacturing facilities to sports venues and specialist storage environments, we work with architects, M&E consultants and project teams to apply SINTRA technology to each building and its performance requirements.

CROSS design services

Every project starts with the building, its use and the environmental conditions it needs to achieve.

Our team works alongside your project team from initial consultation through assisted design, developing the SINTRA system around the building geometry, temperature targets and operational requirements.

For existing facilities, we design around the constraints of the building and its services. For new projects, we work within the architect’s and M&E consultant’s plans to integrate SINTRA from the design stage.

Let’s talk about your project

Talk to our SINTRA project team about your building, performance requirements and how SINTRA could be applied.

Call: **+44 (0) 28 3752 6090**
Email: **info@cross-group.org**
Web: **cross-group.org**

SINTRA

CROSS
Advanced
Temperature
Control

Move less air.
Control more space.

cross-group.org/cross-SINTRA

Designed and produced by ICON Creative | www.icon-creative.com

