JOINT EUROVENT
WEBINAR

EUROVENT
EUROPEAN INDUSTRY ASSOCIATION

EUROVENT
MIDDLE EAST

Eurovent Certita
CERTIFICATION

ENERGY EFFICIENCY OF AIR HANDLING UNITS

Hot and humid climates

28 APRIL 2022

08:00H (CEST) | 10:00H (GST)
11:30H (IST) | 14:00H (SST)

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

Moderator

Markus Lattner

Managing Director, Eurovent Middle East

International Director, Eurovent

Contents

1. **Welcome remarks and introduction**
2. Energy efficiency in hot and humid climates
3. Energy labelling for AHUs in hot and humid climates
4. Technical panel discussion
5. Q&A
6. Summary of key takeaways

Organisers

Media Partner

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

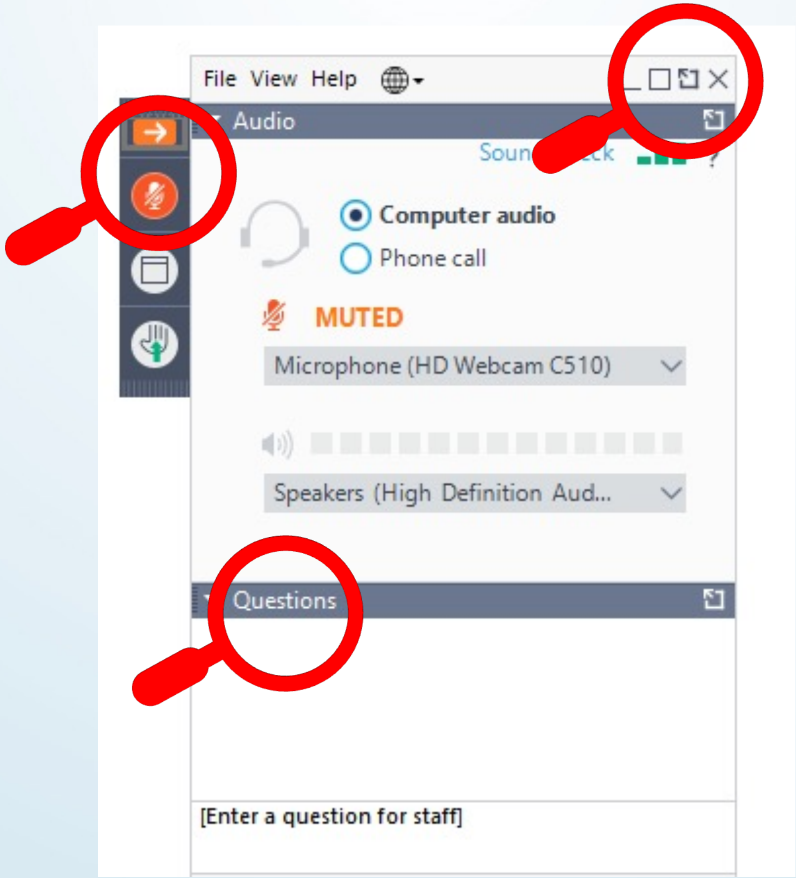
EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

climate control MIDDLE EAST

KEY PERSPECTIVES ON THE REGION'S HVACR INDUSTRY

Technicalities



Your GotoWebinar Control Panel:

→ You are muted

→ Ask us questions

→ To leave the webinar

→ No handouts

Speakers

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

Prabhat PK Goel
Technical and Industry Advisor, Eurovent Certita Certification
Lecturer at ISHRAE Institute of Excellence

Sylvain Courtey
President
Eurovent Certita Certification'

Pedro Lapa
Co-Owner/ Director R&D
EVAC SA
Chairman of Sub-comittee Energy Labelling / ECC

Vanshaj Kaul
Country Representative India, Eurovent Certita Certification
Public Policy professional

Contents

Energy Efficiency of AHUs
Hot and Humid Climates

Prabhat PK Goel

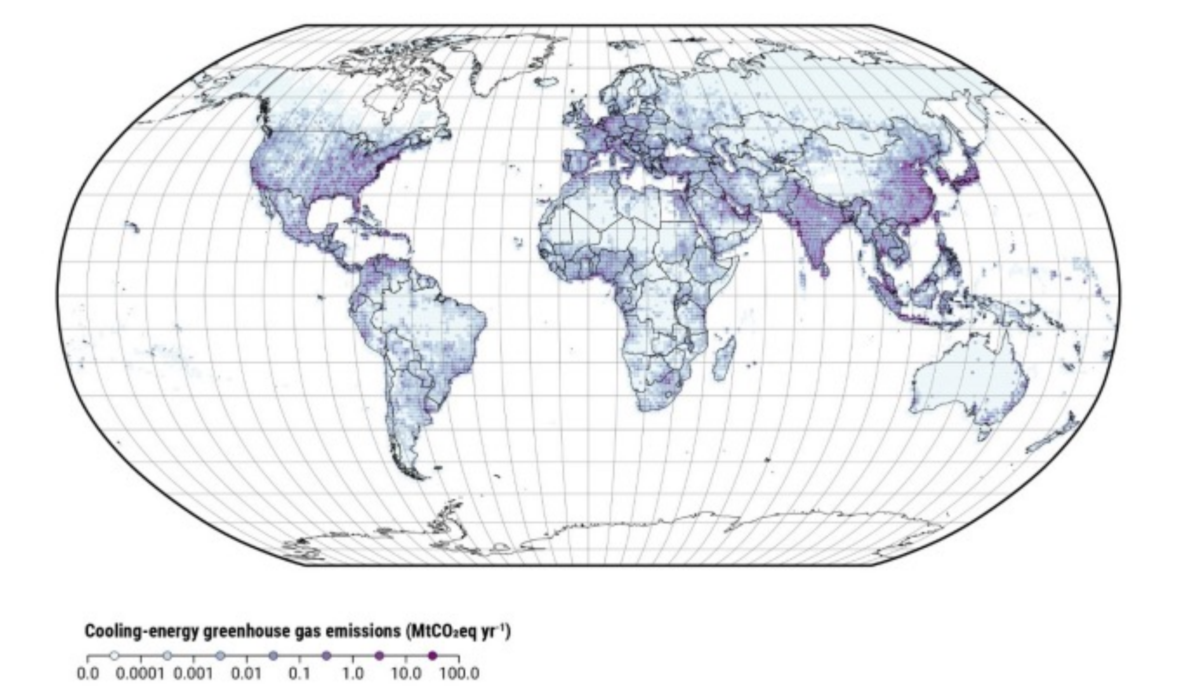
Technical and Industry Advisor, Eurovent Certita Certification

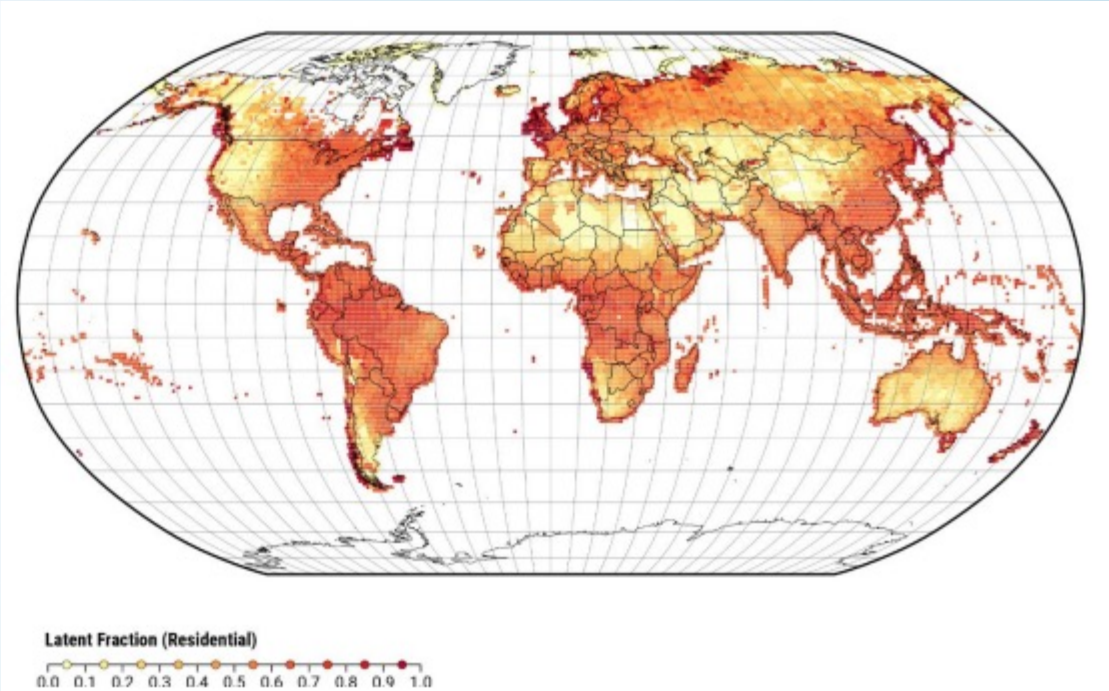
Lecturer at ISHRAE Institute of Excellence

Requirements for AHU in Hot and Humid Climates

- Air Quantities are normally HIGHER than that required in Winter Mode – Leads to Higher Internal Pressure Drops within AHU's
- De-Humidification requires substantial energy – Technologies are in place that can remove moisture from humid fresh air with substantially lesser energy. Similarly 'Evaporative Cooling' wherever possible can be used to reduce 'Sensible Load' by doing pre-cooling
- Cooling to Dehumidify and then Re-Heating to meet temperature requirement can lead to wastage of energy. Alternate ways need to be evaluated.
- Components that are not required and pose a pressure-drop can be bypassed to reduce the internal pressure drop

Requirements for AHU in Hot and Humid Climates

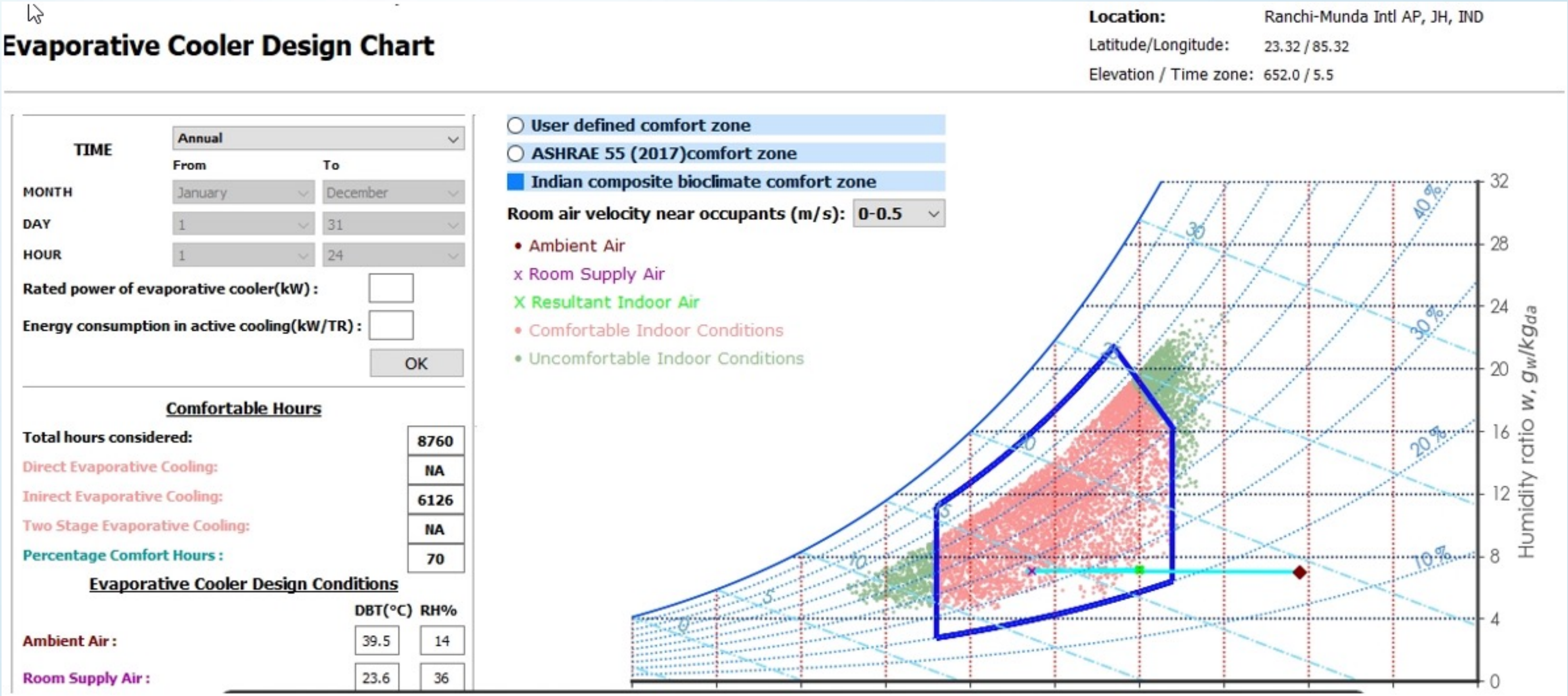




Requirements for AHU in Hot and Humid Climates

- Increased / dual ventilation rate requirements.
- Emphasis on compressor-less cooling for applicable periods – evaporative cooling integration.
- Better use of controls and IOT for free cooling / pre-cooling.
- Any re-heat requirements handled in energy-efficient manner.
- Heat exchangers – plate / wheels - different types used intelligently.
- Effective ways to reduce ‘internal pressure drops’ and reduce fan energy.

Hot and Dry Climate - Evaporative Cooling



Hot and Dry Climate - Evaporative Cooling

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

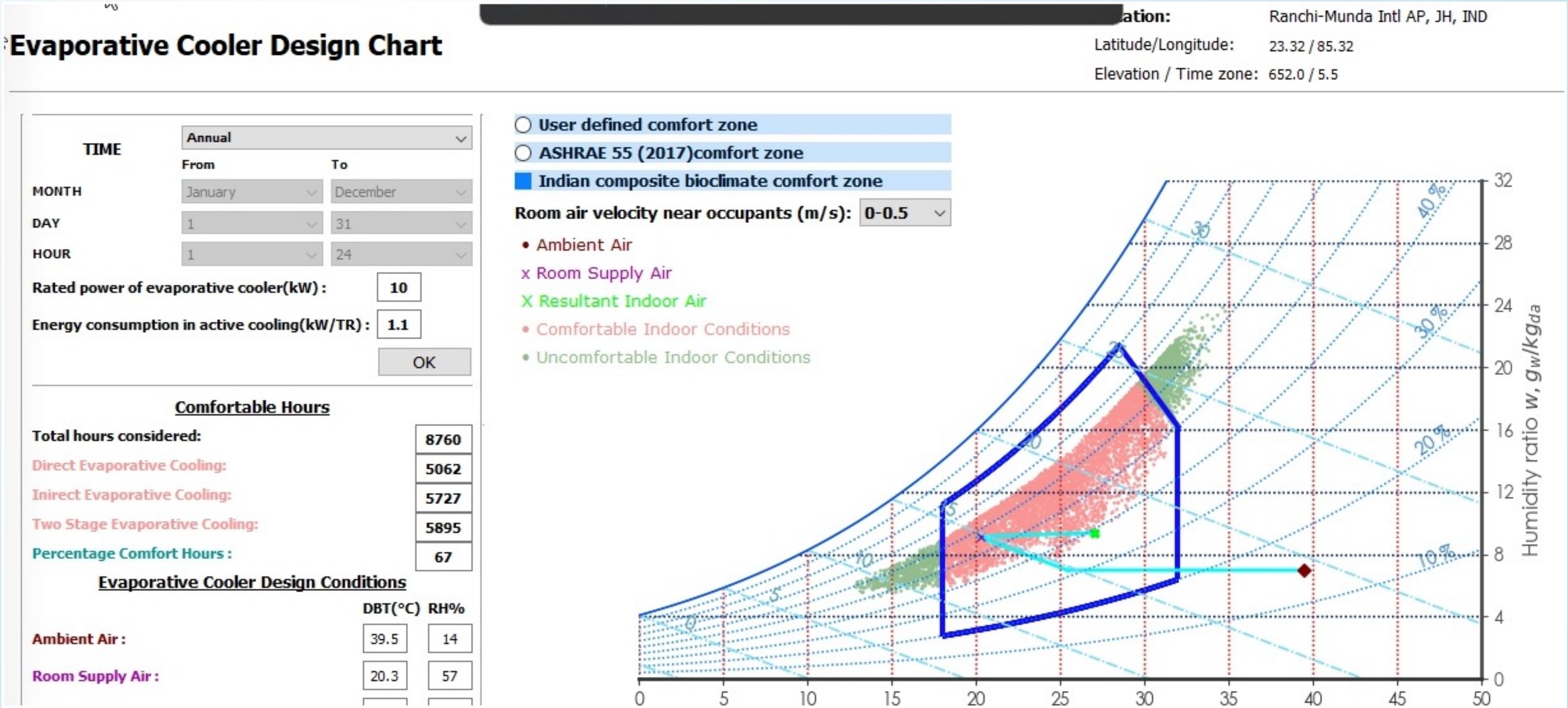
EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

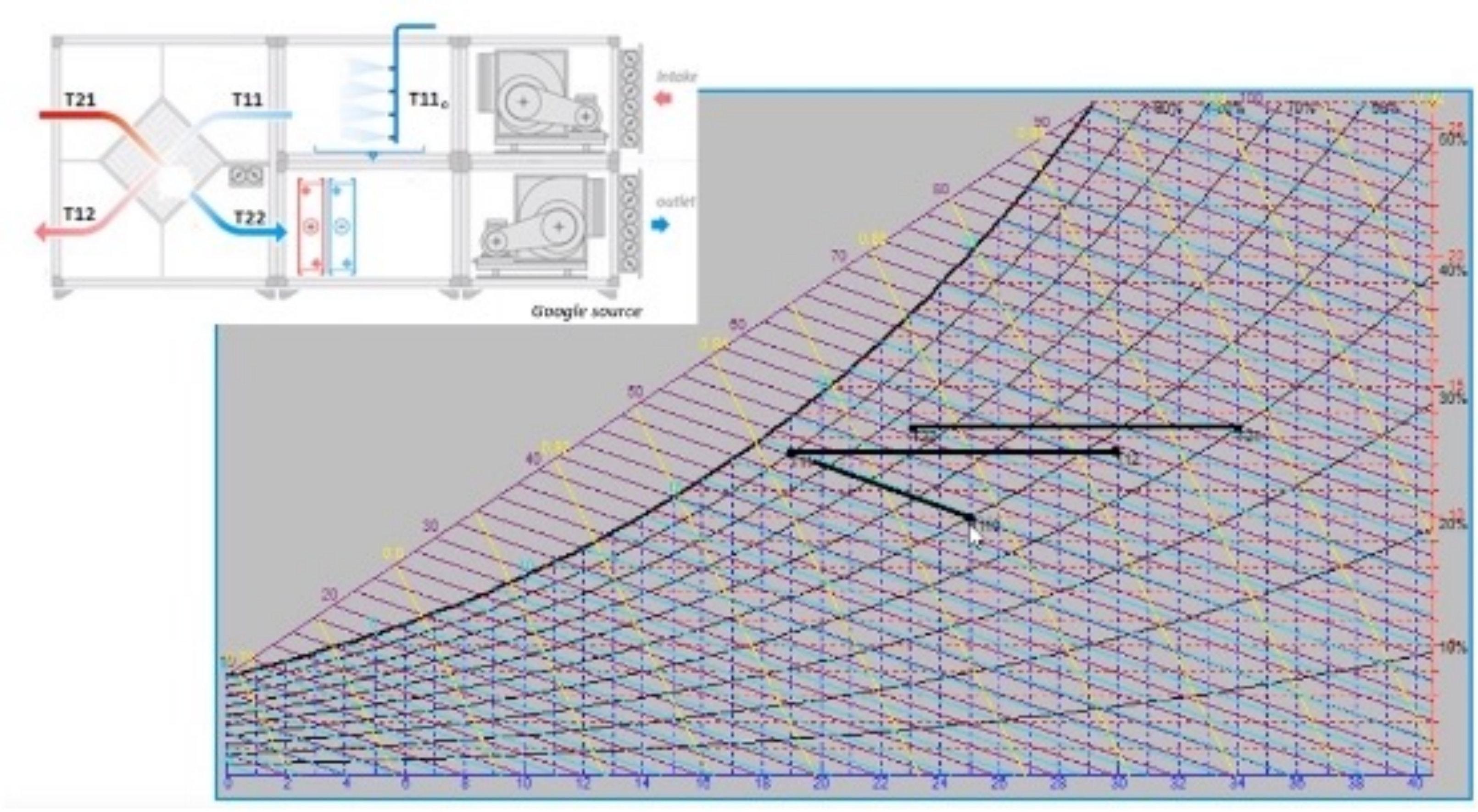
Area	: 8494 sq.ft.
Height	: 11 ft.
Sensible Heat Load	: 185453 Btu/hr
Total Heat Load	: 200000 Btu/hr
Calculated Capacity	: 16120 CFM
Air Changes (rounded-off to the nearest integer)	: 10 ACPH
Designed Usage/Year	: 8760 HRS
Comfortable Hours Within Design Range	: 6126 HRS
Unomfortable Hours Outside Design Range Only Considering Upper Limits	: 2634 HRS
% Comfortable Hours Within Design Range	: 70 %
% Uncomfortable Hours Outside Design Range Only Considering Upper Limits	: 30 %
Peak Water Consumption Without Bleed-off Loss	: 185 LPH
Evaporative Cooling Peak Power Consumption	: Check input power values kW
Estimated Active Air Conditioning Capacity	: 17 TR
Active Cooling Peak Power Consumption	: Check input power values kW
Peak Power Saving With Evaporative Cooling	: Check input power values %

Hot and Dry Climate - Evaporative Cooling

JOINT EUROVENT WEBINAR



Fresh air delivery methods low/no compressor energy



$T_{11_0} = 25\ °C$

$T_{11} = 19\ °C$

$T_{21} = 34\ °C$

$T_{22} = 23\ °C$

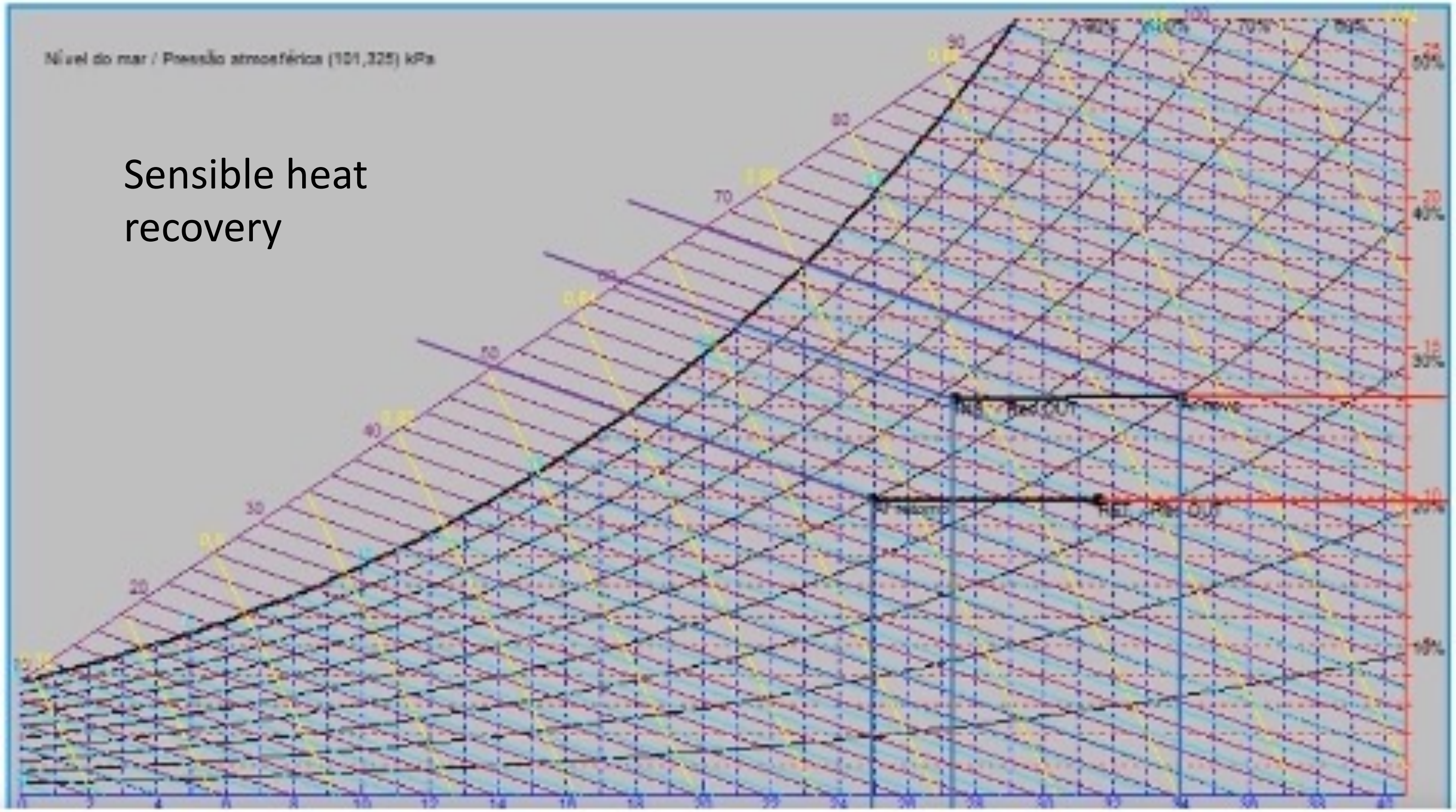
Heat-wheel types

$$\eta_T = \frac{T_{INS.} - T_{AR\_NOVO}}{T_{EXT.} - T_{AR\_NOVO}}$$

$$\eta_T = \frac{T_{22} - T_{21}}{T_{11} - T_{21}}$$

$$\eta_T = \frac{27{,}3 - 34}{25 - 34}$$

$$\eta_T = 74{,}4\%$$



Heat-wheel types

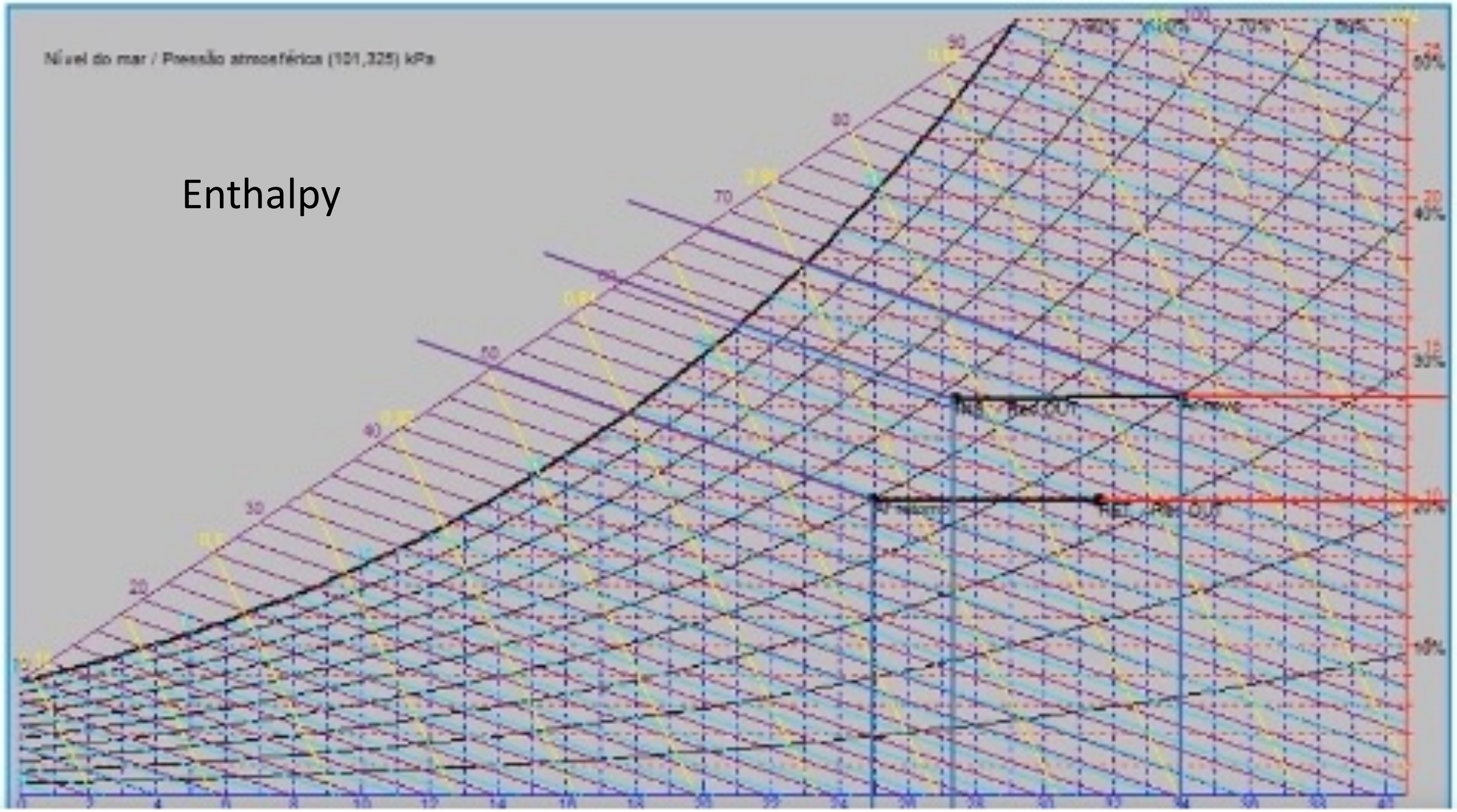
JOINT EUROVENT WEBINAR

$$\eta_T = \frac{T_{INS.} - T_{AR\_NOVO}}{T_{EXT.} - T_{AR\_NOVO}}$$

$$\eta_T = \frac{T_{22} - T_{21}}{T_{11} - T_{21}}$$

$$\eta_T = \frac{27{,}3 - 34}{25 - 34}$$

$$\eta_T = 74{,}4\%$$



$$\eta_H = \frac{X_{22} - X_{21}}{X_{11} - X_{21}}$$

$$\eta_H = \frac{13{,}4 - 13{,}4}{9{,}9 - 13{,}4}$$

$$\eta_H = 0\%$$

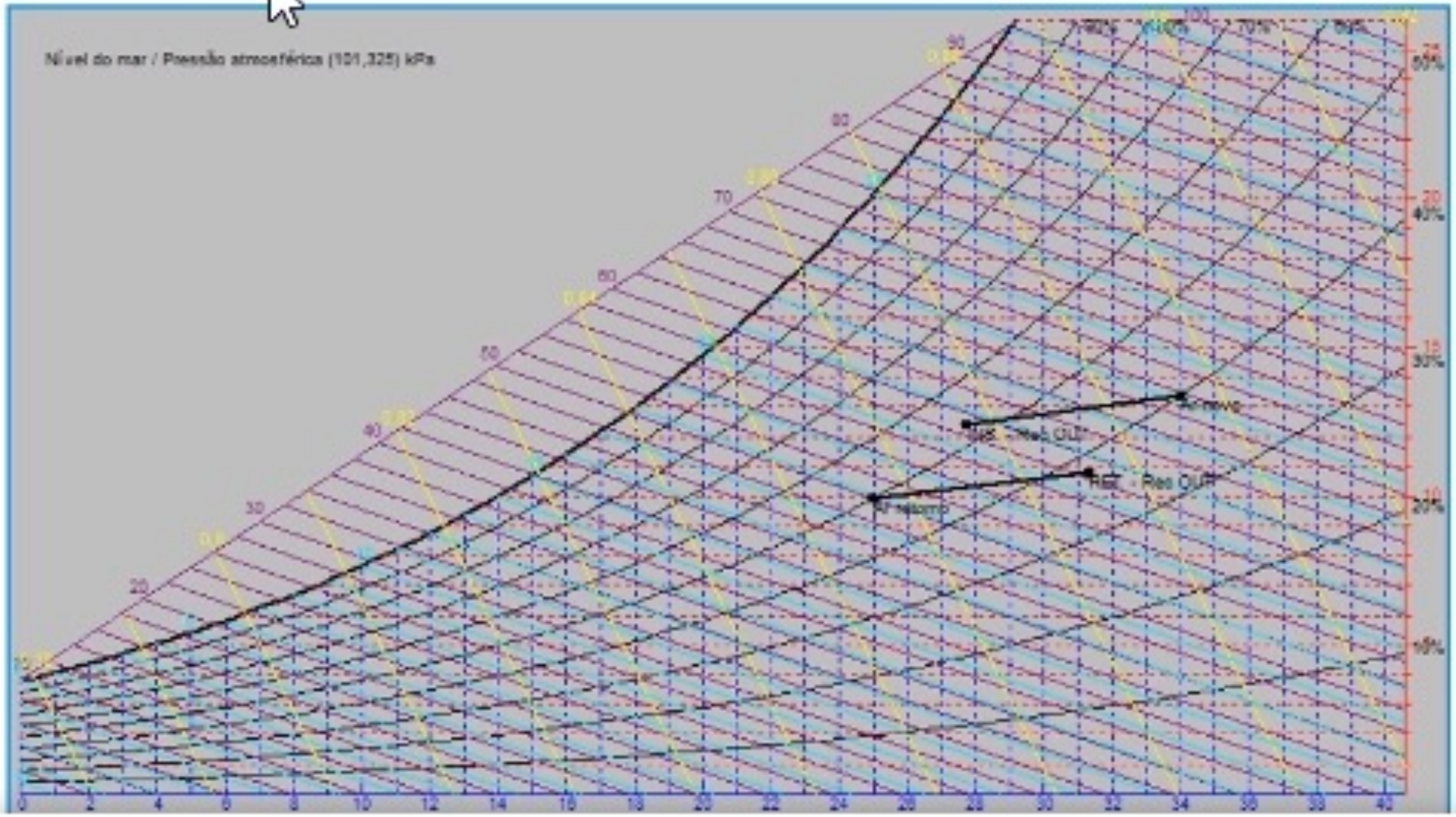
Moisture

$$\eta_E = \frac{h_{22} - h_{21}}{h_{11} - h_{21}}$$

$$\eta_E = \frac{61{,}6 - 68{,}7}{50{,}5 - 68{,}7}$$

$$\eta_E = 39{,}0\%$$

Heat-wheel types



$$\eta_T = \frac{27{,}6 - 34}{25 - 34}$$

$$\eta_T = 71{,}1\%$$

$$\eta_H = \frac{12{,}5 - 13{,}4}{9{,}9 - 13{,}4}$$

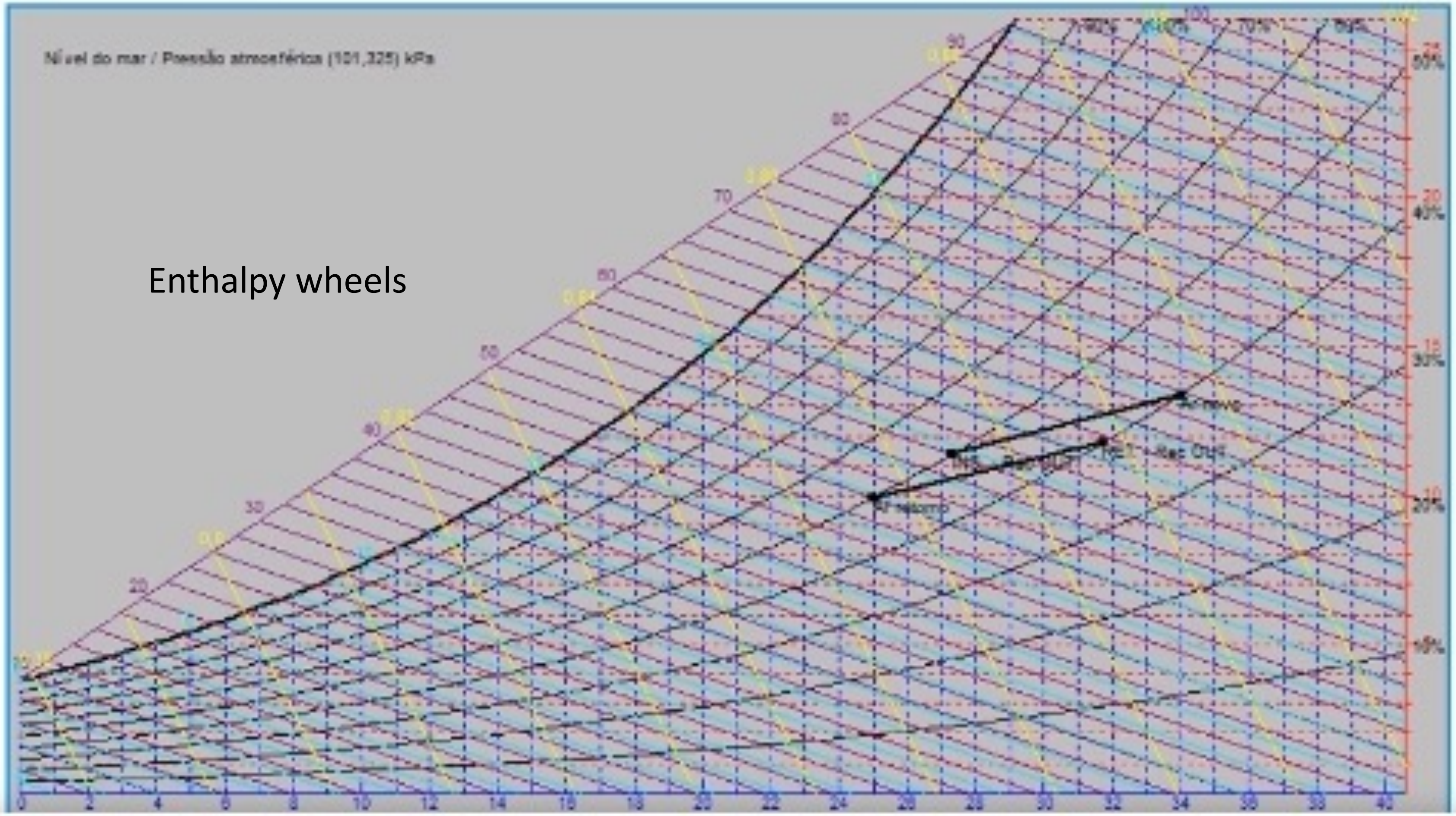
$$\eta_H = 25{,}7\%$$

Latent heat

$$\eta_E = \frac{59{,}7 - 68{,}7}{50{,}5 - 68{,}7}$$

$$\eta_E = 49{,}5\%$$

Heat-wheel types



$$\eta_T = \frac{27{,}3 - 34}{25 - 34}$$

$$\eta_T = 74{,}4\%$$

Sensible

$$\eta_H = \frac{11{,}4 - 13{,}4}{9{,}9 - 13{,}4}$$

$$\eta_H = 58{,}3\%$$

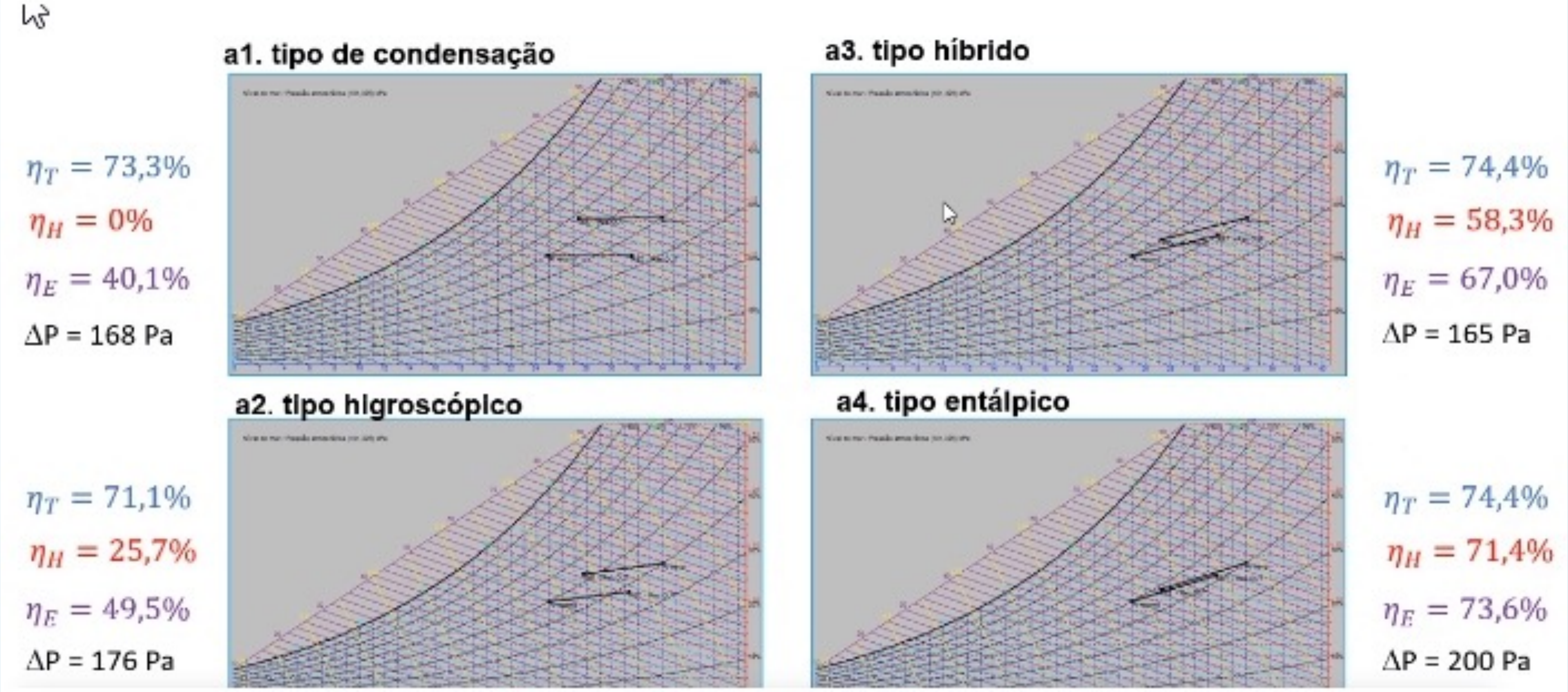
Latent

$$\eta_E = \frac{56{,}5 - 68{,}7}{50{,}5 - 68{,}7}$$

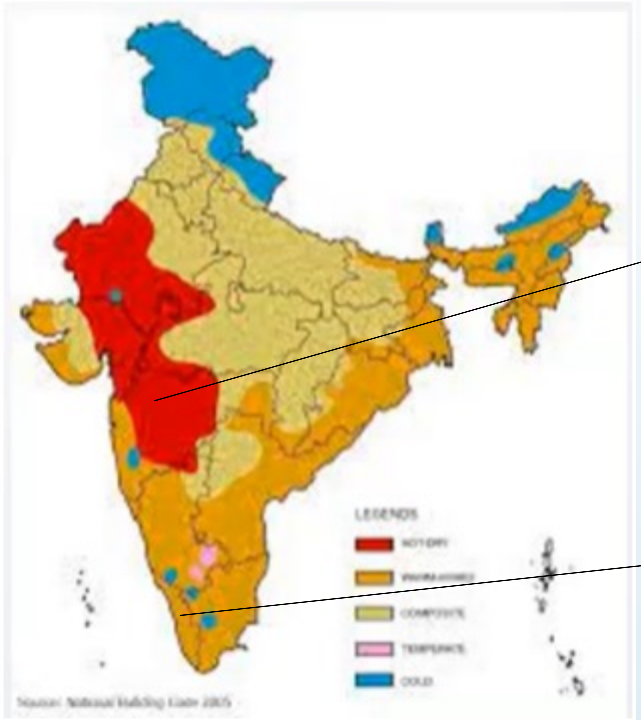
$$\eta_E = 67{,}0\%$$

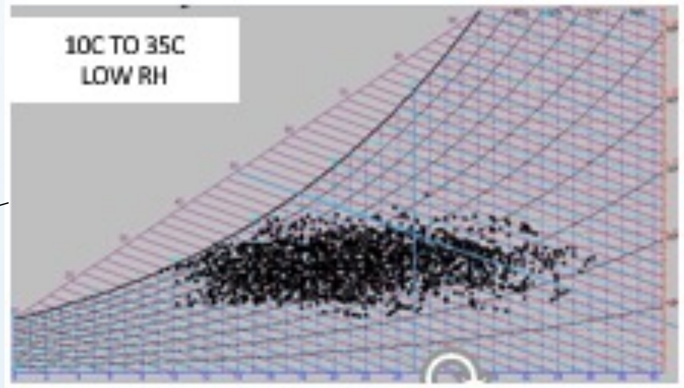
Enthalpy

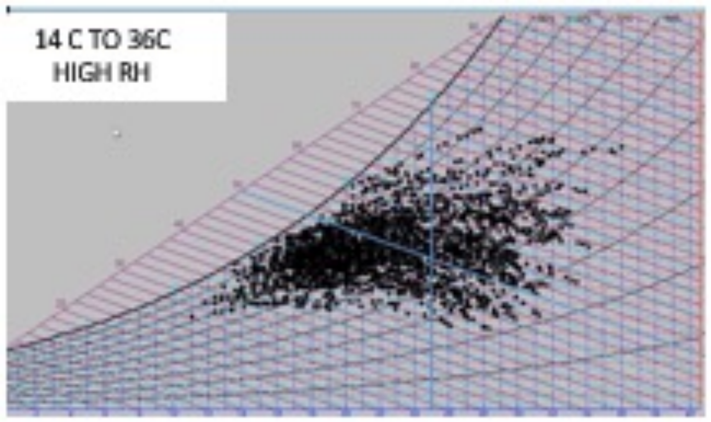
Heat-wheel types



Heat-wheel types

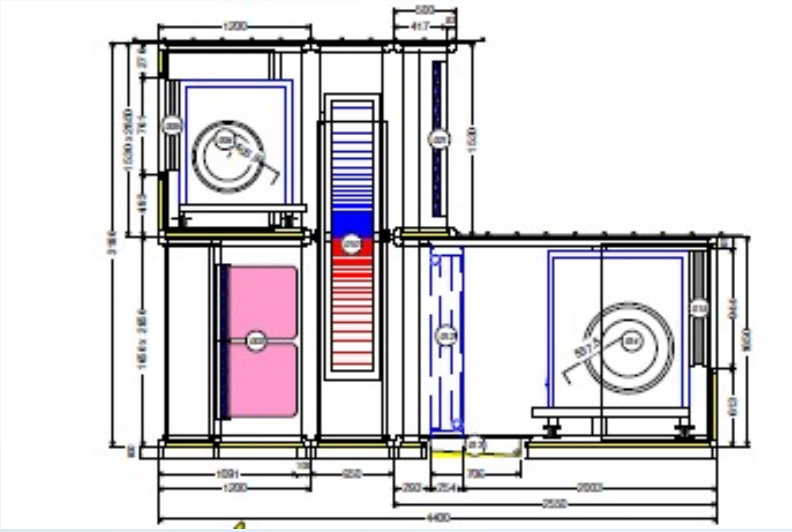


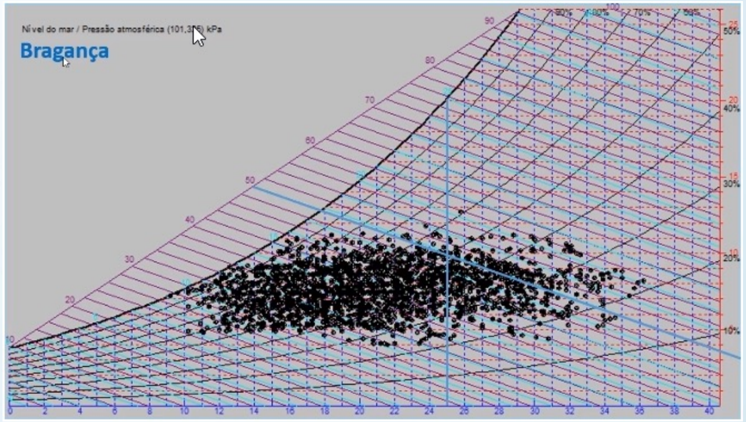


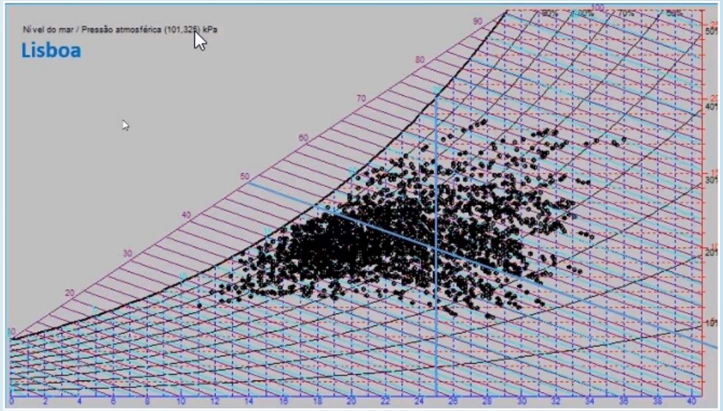


Different places have different 8760 hours scatter charts

Heat-wheel types







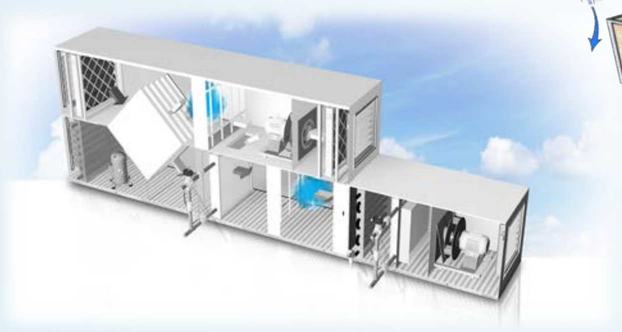
A complete energy analysis with all 8760 hours or operating hours may be required with all 4 types of wheels to determine best energy performance.

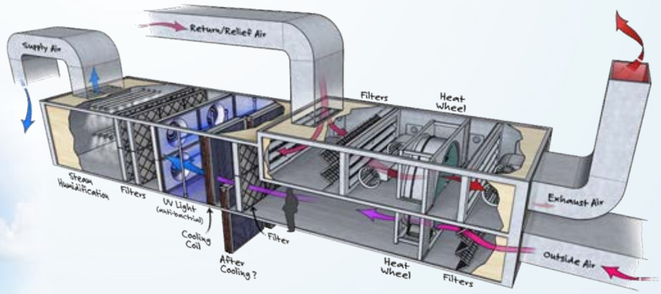
AHU
energy data simulation

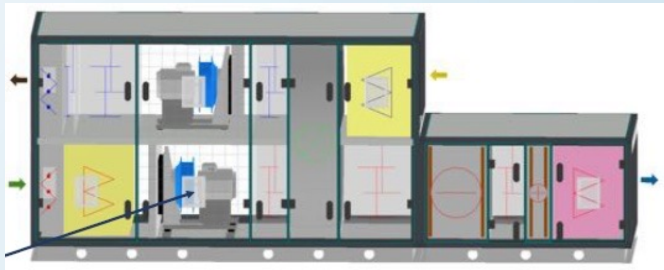
JOINT EUROVENT WEBINAR

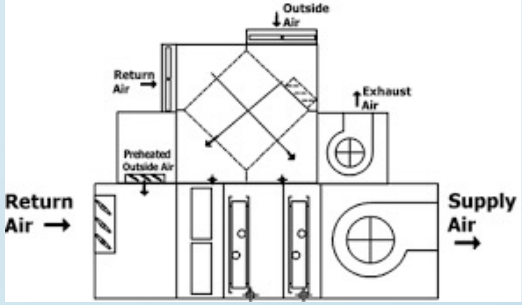
EUROVENT EUROPEAN INDUSTRY ASSOCIATION | EUROVENT MIDDLE EAST | Eurovent Certita CERTIFICATION

Holistic approach









- Prediction of energy efficiency is not dependent on component only;
- 8760 Hrs of data for outdoor air and weather conditions is important.
- Air velocity, arrangement and spacing is important.
- Intelligent use of bypass dampers to control internal pressure drops is required

Energy Performance

Factors affecting AHU energy consumption

- Lower average filter pressure drop over useful LIFE of filter while meeting desired PM levels in space.
- Lower Velocity of Air over filter.
- Low pressure drop and High Efficiency of ‘Heat Recovery System’ (Standard and Hygeinic AHU).
- High fan efficiency grade.
- High fan motor efficiency class.
- Intelligent use of component bypass dampers.

Workshop Preview

Coming up (May/June 2022):

Webinar on Energy Recovery and Energy Efficiency

Two days training workshop on how to assess energy efficiency figures of Air Handling Units

Workshop Preview

JOINT EUROVENT WEBINAR

Derivation of Pa(T) and Pa(H) Values

$$\Delta P_y = [\Delta P_{s-HRS} - \Delta P_{class-T}] * f_{T-H} + [\Delta P_{s-HRS} - \Delta P_{class-H}] * (1 - f_{T-H})$$

	Velocidade do ar secção referência	Perda de carga do recuperador de calor	
	m/s	Pa[T]	Pa[H]
A+ / A+C	1.4	167	222
A / AC	1.6	160	213
B / BC	1.8	155	207
C / CC	2.0	151	202
D / DC	2.2	147	197

Coming up: Eurovent Webinar on Energy Recovery and Efficiency

AHU Energy Labelling Fundamentals

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION · EUROVENT MIDDLE EAST · Eurovent Certita CERTIFICATION

- What are the factors influencing the energy consumption of AHUs
- Should better selection and practice towards lower energy consumption for same AIRFLOW and external static pressure be rewarded
- Should building energy efficiency simulation have these related parameters as variables for determining differences when targeting 'NET-ZERO' potential
- Should specifiers and building rating agencies specify intended **Energy Class** required on Projects

Reward Energy Recovery

Overall performance value (OPV) is based on both mechanical and thermal performance.

OPV = 35% of (MPV) + 65% of (TPV)

Table 19: Reference table for energy efficiency calculations

CLASS	Velocity V_{class} [m/s]	Heat recovery system		Fan Efficiency Grade NGref-class [-]	Thermal performance value (TPV)
		ηclass [%]	Δpclass [Pa]		
A+ /A+↳/A+↑	1.4	83	250	64	1
A /A↳/A↑	1.6	78	230	62	0.8
B /B↳/B↑	1.8	73	210	60	0.6
C /C↳/C↑	2.0	68	190	57	0.4
D /D↳/D↑	2.2	63	170	52	0.2
E /E↳/E↑	No requirement				0

ISHRAE RAMA

ISHRAE – RAMA Standard - 20002 : 2020

Standard For Air Handling Units - General Requirements, Performance Testing And Rating
ISHRAE – RAMA Standard - 20003 : 2020

AHU Energy Classification

Energy efficiency classes are defined in the technical certification rules:

Eurovent label for winter conditions

Eurovent label for summer conditions

CLASS	All Units	Units for full of partial outdoor air at design winter temperature ≤ 9°C		
	Velocity	Heat recovery system		Fan Efficiency Grade
	v_{class} [m/s]	η_{class} [%]	Δp_{class} [Pa]	$NG_{ref\text{-}class}$ [-]
A+ / A+↪ / A+	1.4	83	250	64
A / A↪ / A↑	1.6	78	230	62
B / B↪ / B↑	1.8	73	210	60
C / C↪ / C↑	2.0	68	190	57
D / D↪ / D↑	2.2	63	170	52
E / E↪ / E↑	No calculation required			No requirement

Eurovent winter calculations

CLASS	All Units	winter dry bulb temperature ≥ -3°C AND dry bulb temperature ≥ 30°C OR winter dry bulb temperature ≥ -3°C AND dew-point temperature ≥ 17°C OR dry bulb temperature ≥ 30°C AND dew-point temperature ≥ 17°C				
	Velocity	Heat recovery system				Fan Efficiency Grade
	v_{class} [m/s]	$\eta_{class\text{-}T}$ [%]	$\Delta p_{class\text{-}T}$ [Pa]	$\eta_{class\text{-}H}$ [%]	$\Delta p_{class\text{-}H}$ [Pa]	$NG_{ref\text{-}class}$ [-]
A+ / A+↪	1.4	83	167	81	222	64
A / A↪	1.6	78	160	73	213	62
B / B↪	1.8	73	155	65	207	60
C / C↪	2.0	68	151	58	202	57
D / D↪	2.2	63	147	50	197	52
E / E↪	No calculation required					No requirement

Eurovent summer calculations

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

Thank you!

Prabhat PK Goel

Technical and Industry Advisor, Eurovent Certita Certification

Lecturer at ISHRAE Institute of Excellence

pkgoel123@hotmail.com

Contents

1. Welcome remarks and introduction
2. Energy efficiency in hot and humid climates
3. **Energy labelling for AHUs in hot and humid climates**
4. Technical panel discussion
5. Q&A
6. Summary of key takeaways

JOINT EUROVENT WEBINAR

Energy labelling for AHUs
Hot and humid climates

Sylvain Courtey

President

Eurovent Certita Certification

JOINT EUROVENT WEBINAR

Content

1. Eurovent Certita Certification - Facts & Figures
2. Third Party Certification - Importance of Independent Assessment
3. AHU certification Programme - Hot & Humid Climates
4. How does it Work - User Guidance

Eurovent Certita Certification

Facts and figures

Eurovent Certita Certification

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

- ✓Third party certification body
- ✓ISO 17065:2012, Scheme 5 accredited
- ✓Almost 50 certification schemes
- ✓A team of 60 permanent people dedicated to certification
- ✓10 languages spoken

Table 1 — Building a product certification scheme

	Conformity assessment functions and activities[a] within product certification schemes	Types of product certification schemes[b]							
		1a	1b	2	3	4	5	6	N[c,d]
I	**Selection**, including planning and preparation activities, specification of requirements, e.g. normative documents, and sampling, as applicable	x	x	x	x	x	x	x	x
II	**Determination of characteristics**, as applicable, by: a) testing b) inspection c) design appraisal d) assessment of services or processes e) other determination activities, e.g. verification	x	x	x	x	x	x	x	x
III	**Review** Examining the evidence of conformity obtained during the determination stage to establish whether the specified requirements have been met	x	x	x	x	x	x	x	x
IV	**Decision on certification** Granting, maintaining, extending, reducing, suspending, withdrawing certification	x	x	x	x	x	x	x	x
V	**Attestation, licensing**								
	a) issuing a certificate of conformity or other statement of conformity (attestation)	x	x	x	x	x	x	x	x
	b) granting the right to use certificates or other statements of conformity	x	x	x	x	x	x	x	
	c) issuing a certificate of conformity for a batch of products		x						
	d) granting the right to use marks of conformity (licensing) is based on surveillance (VI) or certification of a batch		x	x	x	x	x	x	
VI	**Surveillance**, as applicable (see 5.3.4 to 5.3.8), by:								
	a) testing or inspection of samples from the open market			x		x	x		
	b) testing or inspection of samples from the factory				x	x	x		
	c) assessment of the production, the delivery of the service or the operation of the process				x	x	x	x	
	d) management system audits combined with random tests or inspections						x	x	

Eurovent Certita Certification

Certified Product Range

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

How does it work?

Comparison between the measured values and the declared values

Production sites **audits**

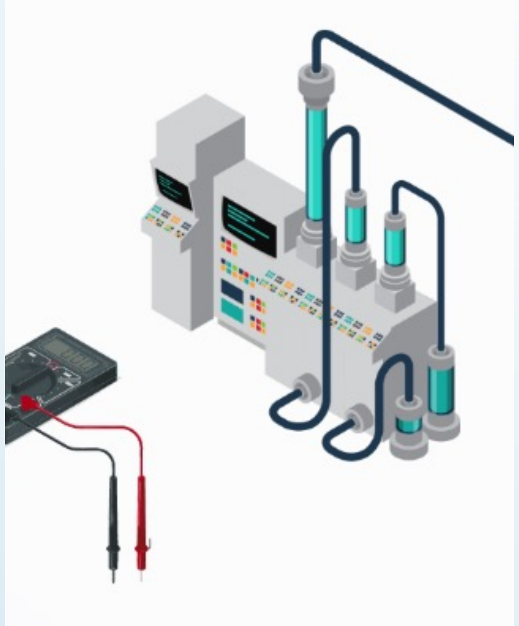
Corrective actions progress assessment (if any)

Product **performance testing** in an independent laboratory

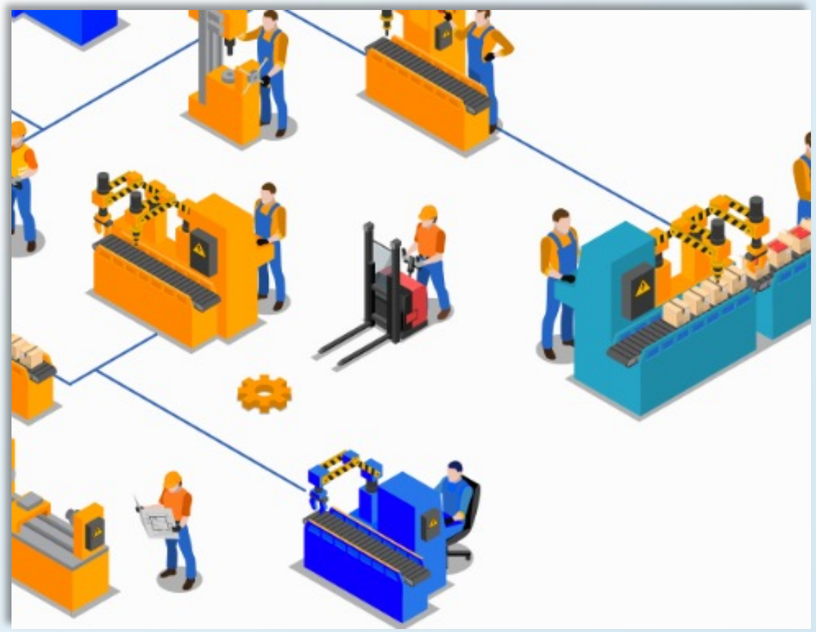
Compliance with general ECP rules

+ *Check of selection tool* *whenever applicable*

How does it work?



1. Laboratory Test



2. Factory Audit

3. Selection Software Check

Global recognition

Third Party Certification

The importance of independent assessment

Why third party certification?

- ✓ Integrity*
- ✓ Independency*
- ✓ Impartiality*
- ✓ Competency*

Verification, Trust, Comparability

Why third party certification?

- **Self declaration:** the worst confidence level, the minimum of protection is ensured by Market Surveillance Authorities…!
- **Factory Acceptance Test, possibly backed-up by third party protocol:** lack of independency from manufacturers facilities, limited trust for mass productions
- **Sample test by independent Labs** (++ if ISO 17025 Accredited labs): strong risk of Sampling manipulation (Golden product Syndrome!)
- **Certification by Independent Bodies ISO 17065 Accredited**: Competence, Robustness, Independence verified by accreditation bodies linked to IAF (International Accreditation Forum)

Benefits of third party certification

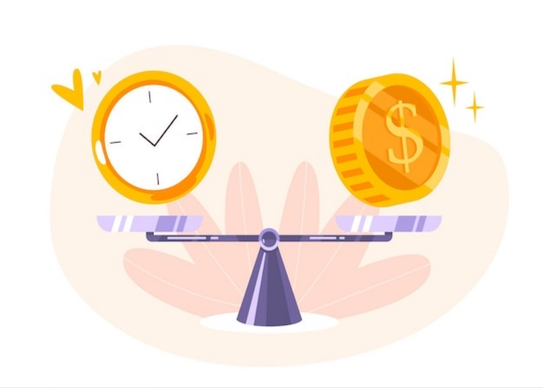
JOINT EUROVENT WEBINAR

Trust

Comparability

Accuracy

Savings



AHU certification programme

Hot and humid climates

Certified Characteristics

1 Mechanical Characteristics

- Casing strength (CS)
- Casing Air Leakage (CAL)
- Filter Bypass Leakage (FBL)
- Casing Thermal Transmittance (TT)
- Thermal Bridging Factor (TBF)
- Acoustic Insulation

2 Performance Characteristics

- Airflow - available static pressure-absorbed power
- Duct sound power level per octave band
- Airborne sound power level
- Heating Capacity*
- Cooling Capacity*
- Energy recovery
- Pressure loss on the water side*

** Standard Characteristics of product range*

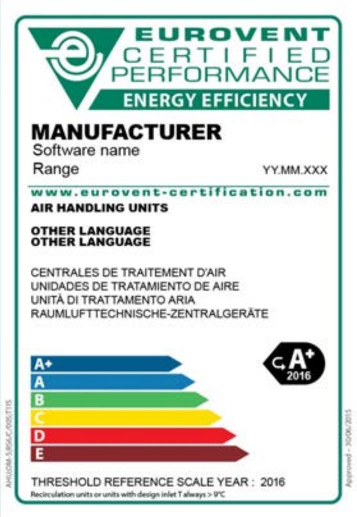
Evolution of the program

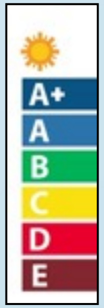
More than 140 AHU's manufacturers in the World !

→

Merged with ASHRAE climate database of 4.241 cities

→





1998 | 2004 | 2005 | 2006 | 2016 | 2016 | 2016 | 2017 | 2017 | 28/4/2022

Energy Labelling

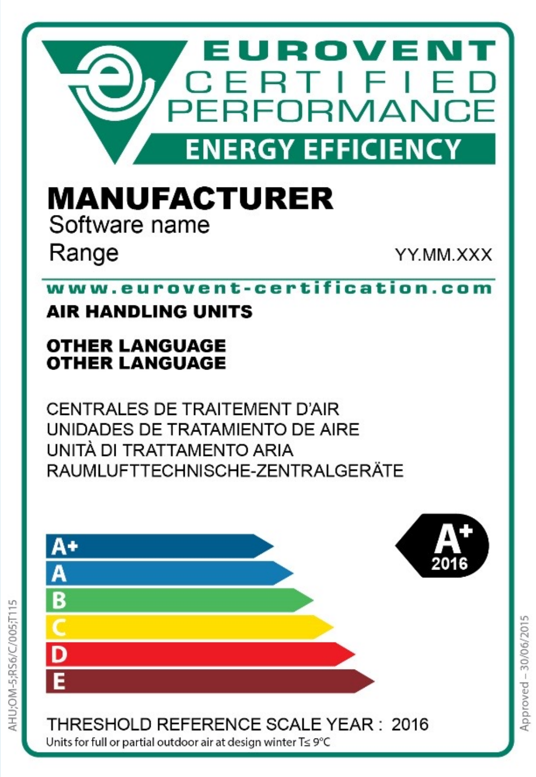
JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

Current version of the EEC label

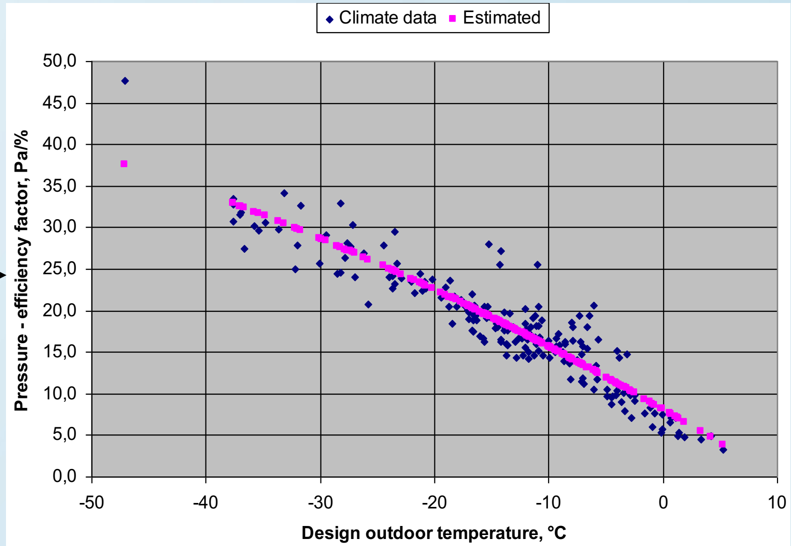


Air velocity of the fan section

Heat recovery efficiency

Heat recovery pressure drop

Fan efficiency



The pressure – efficiency factor [Pa%] is based on a heating application, typically for north European countries. This graph indicates that from 9°C the efficiency of the heat exchanger is not considered

There is a need to adapt this calculation to warm countries for a cooling application

Energy labelling winter conditions

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION EUROVENT MIDDLE EAST Eurovent Certita CERTIFICATION

Energy Classes are defined by 4 parameters:

1. **Air velocity** in the unit
2. Heat recovery system **dry efficiency***
3. Heat recovery system **pressure drop***
4. **Fan Efficiency** Grade

* Only for units for full or partial outdoor air **at design winter temperature ≤ 9°C**.

F.4 Reference table

CLASS	All Units	Units for full or partial outdoor air at design winter temperature ≤ 9°C		
	Velocity	Heat recovery system		Fan Efficiency Grade
	v_{class} [m/s]	η_{class} [%]	Δp_{class} [Pa]	$NG_{ref\text{-}class}$ [-]
A+ / A+⤷ / A+↑	1.4	83	250	64
A / A⤷ / A↑	1.6	78	230	62
B / B⤷ / B↑	1.8	73	210	60
C / C⤷ / C↑	2.0	68	190	57
D / D⤷ / D↑	2.2	63	170	52
E / E⤷ / E↑	No calculation required			No requirement

Table 6: Table for energy efficiency calculations

The lowest classes E, E⤷ and E↑ have no requirements.

Energy Labelling

General Considerations for a hot and humid climate label:

1. An independent label, keeping the current EEC for heating and create new label for cooling (dual EEC)
2. Methodology similar to EEC winter
3. Input data - Summer outdoor design conditions
   -> Summer criteria 2 (ASHRAE 2017 99%), monthly design DB (2%) used as reference
4. From the current EEC for winter application only the two pressure corrections Δpy and Δpz are impacted

Energy labelling summer conditions

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION | EUROVENT MIDDLE EAST | Eurovent Certita CERTIFICATION

Classes are defined by 5 parameters:

1. **Air velocity** in the unit
2. Heat recovery system **dry efficiency***
3. Heat recovery system **wet efficiency***
4. Heat recovery system **pressure drop***
5. **Fan Efficiency** Grade

* Only for units for full or partial outdoor air at design conditions acc. to subgroup 1

The following reference is applicable for the calculation of the correction factors for summer application:

CLASS	All Units	Units for full or partial outdoor air at design summer: winter dry bulb temperature ≥ -3°C AND dry bulb temperature ≥ 30°C OR winter dry bulb temperature ≥ -3°C AND dew-point temperature ≥ 17°C OR dry bulb temperature ≥ 30°C AND dew-point temperature ≥ 17°C				
	Velocity	Heat recovery system				Fan Efficiency Grade
	v_{class} [m/s]	$\eta_{class-T}$ [%]	$\Delta p_{class-T}$ [Pa]	$\eta_{class-H}$ [%]	$\Delta p_{class-H}$ [Pa]	$NG_{ref-class}$ [-]
A+ / A+Ϛ	1.4	83	167	81	222	64
A / AϚ	1.6	78	160	73	213	62
B / BϚ	1.8	73	155	65	207	60
C / CϚ	2.0	68	151	58	202	57
D / DϚ	2.2	63	147	50	197	52
E / EϚ	No calculation required					No requirement

Table 8: Table for energy efficiency calculations (summer application)

Comparison between the labels

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

Winter energy classes are defined by 4 parameters:

1. Air velocity in the unit
2. Heat recovery system dry efficiency*
3. Heat recovery system pressure drop*
4. Fan Efficiency Grade

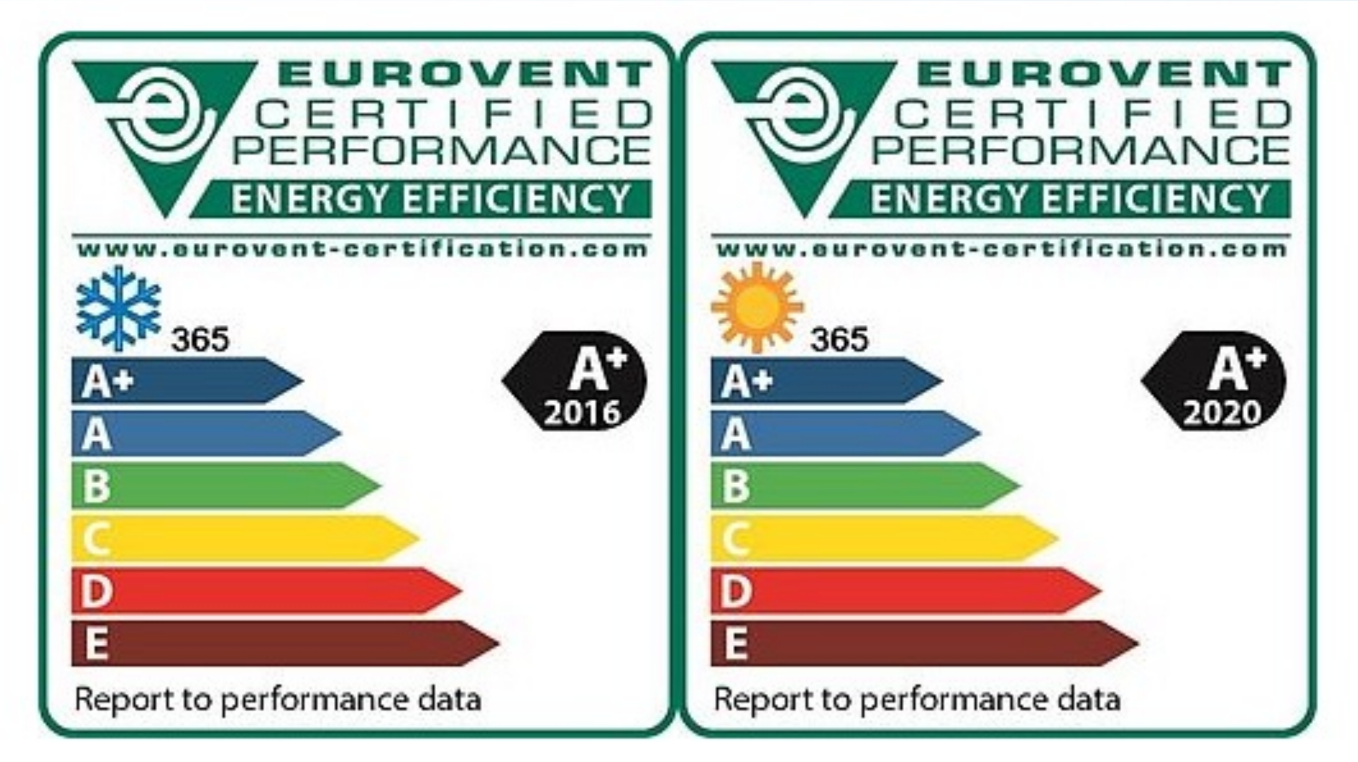
* Only for units for full or partial outdoor air **at design winter temperature ≤ 9°C**.

Summer energy classes are defined by 5 parameters:

1. Air velocity in the unit
2. Energy recovery system dry efficiency*
3. Energy recovery system wet efficiency*
4. Energy recovery system pressure drop*
5. Fan Efficiency Grade

* Only for units for full or partial outdoor air at design conditions acc. to subgroup 1

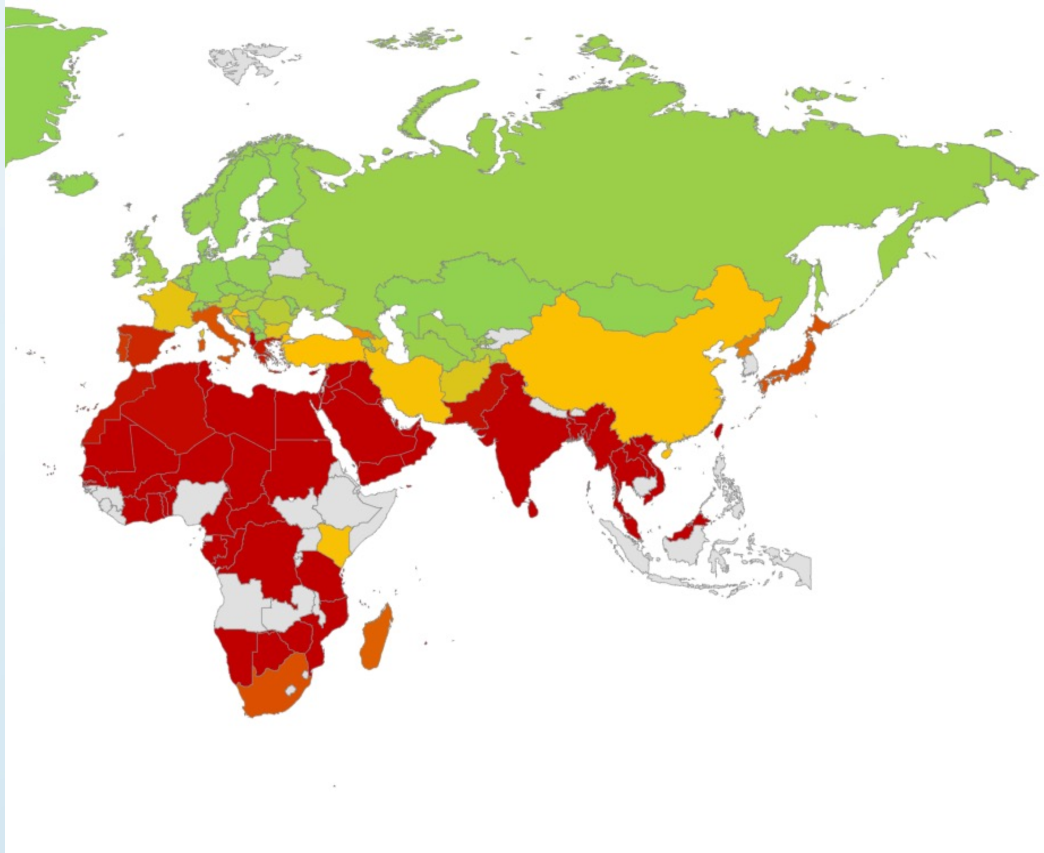
Different Energy Labels



Eurovent Winter Label Eurovent Summer Label

Regional application

- Countries where the use of the summer label is mandatory are marked in red (subgroup 1)
- Grey areas no data available or processed
- Design temperature is defined by location (based on ASHRAE)

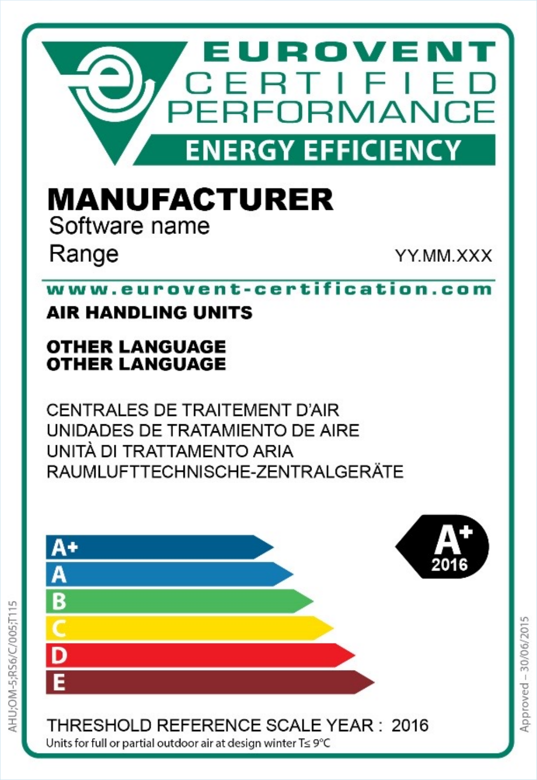


Parameters for warm climate

3 features that improve the energy performance of an AHU in a cooling state are considered:

- Humidity recovery by the Energy Recovery System
- Indirect adiabatic cooling
- Decrease of the internal static pressure

  when ERS is on bypass mode



Humidity recovery

As for the current energy efficiency calculation two pressure corrections will be calculated:

- Pressure correction due to the HRS pressure drop: Δpy
- Pressure correction due to the HRS efficiency: Δpz

A factor that weighs the importance between recovery temperature and humidity has been defined. It is a function of the outdoor climate, that have been derived from numerous energy consumption calculation all over the world (more particularly Europe, Middle East and India)

Indirect adiabatic cooling

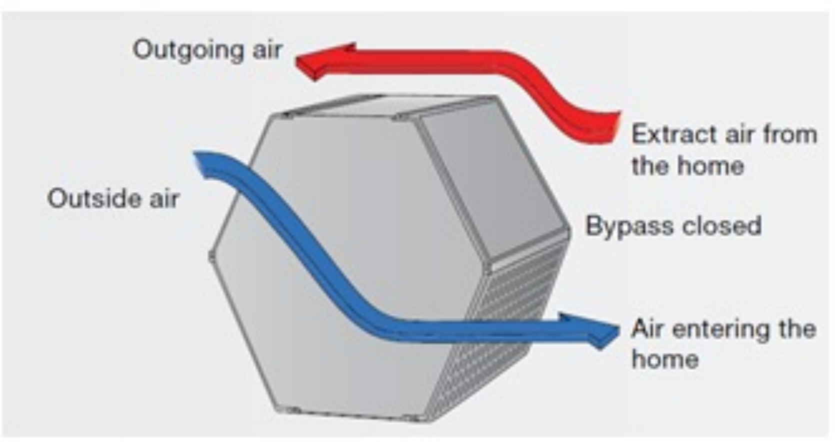
The indirect adiabatic cooling (IAC) must be considered for the two seasons, winter and summer. The determination of the season is based on the "Heating and Cooling degree days" (HDD and CDD).

The IAC will impact the two pressure correction presented in the previous slide.

- For the pressure drop: this impact will be represented by the actual pressure drop of the IAC system
- For the efficiency a factor that reflect the increase on dry recovery has been defined, if it doesn't exist (i.e. no IAC used in the AHU) it will be fixed at 1 (i.e. no impact)

Bypass mode

Just like the indirect adiabatic cooling (IAC) the bypass mode must be considered for the two seasons, winter and summer. The determination of the season is based on the "Heating and Cooling degree days" (HDD and CDD).



In this case only the pressure correction due to the ERS pressure drop will be impacted

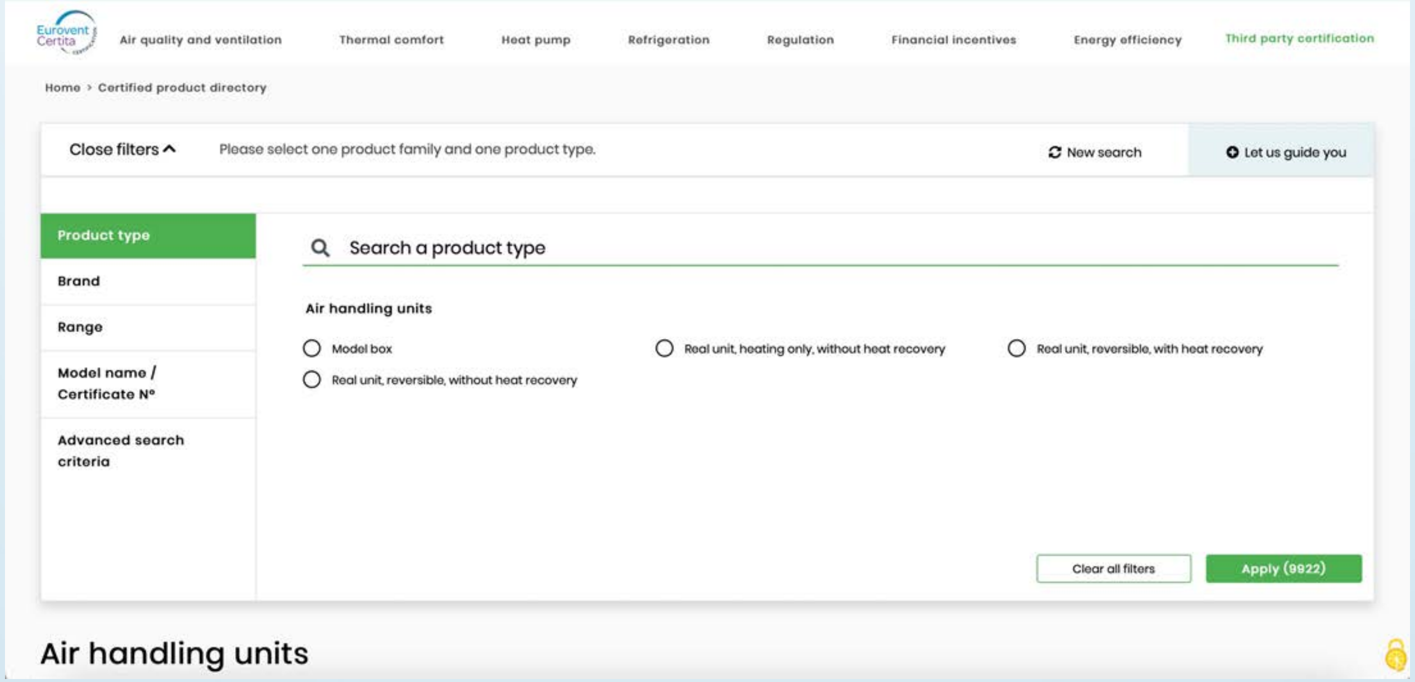
How does it work?

User guidance

How to Use it

How ESCO’s, Authorities, Engineers & Developers can use it:

Certified product directory at www.eurovent-certification.com



JOINT EUROVENT WEBINAR

Thank you!

Sylvain Courtey

President

Eurovent Certita Certification

s.courtey@eurovent-certification.com

Contents

1. Welcome remarks and introduction
2. Energy efficiency in hot and humid climates
3. Energy labelling for AHUs in hot and humid climates
4. **Technical panel discussion**
5. Q&A
6. Summary of key takeaways

Panel / Q&A

JOINT EUROVENT WEBINAR

Prabhat PK Goel

Pedro Lapa

Markus Lattner
Moderator

Sylvain Courtey

Vanshaj Kaul

Summary

Essential factors for energy efficiency in hot and humid climates:

- The correct energy recovery is crucial
- Adiabatic cooling and by-pass modes will be integrated soon
- ECC Summer Label enables comparability
- Available now for countries with such conditions
- Third party certification is key for trust
- Market surveillance can be done with third party certification programmes

Notes

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

Webinar recordings will be available on the Eurovent and Eurovent Middle East YouTube channels

Follow Eurovent, Eurovent Middle East and Eurovent Certita Certification on LinkedIn

Media Partner

JOINT EUROVENT WEBINAR

EUROVENT EUROPEAN INDUSTRY ASSOCIATION

EUROVENT MIDDLE EAST

Eurovent Certita CERTIFICATION

climate control MIDDLE EAST

KEY PERSPECTIVES ON THE REGION'S HVACR INDUSTRY

Thank You!