

BENDIGTM
Hygienic Air Handling Unit



CERTIFICATE N° 20.11.003
RANGE : PTP-H

Hygienic Air Handling Unit



Guarantee no residue or positive growth micro organism in AHU cabinet materials
Testing standard DIN EN 1946/4-6 materials coating properties
3-stars Eurovent Hygienic Certified
Determine specific Hygienic feature in each unit

www.metadec-ahu.com

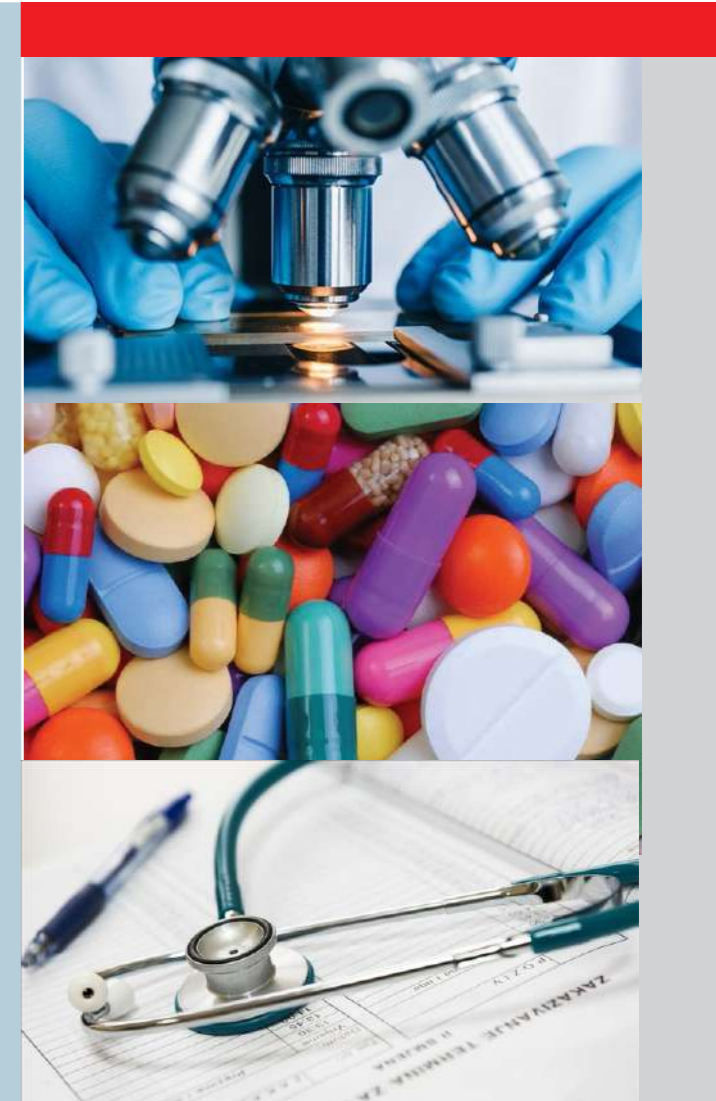
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Hygienic air handling unit

Introduction

BENDIG has been participating in the Eurovent Certification program since 2012. The certification body has recently, extend their program coverage to hygienic design prospect of air handling units. **BENDIG** has been developed its PTP-H range to full fill broader requirement for units serving in public area, cleanroom, and healthcare facility. Our PTP-H range is now Eurovent Hygienic certified with 3 stars rating. The highest rating suitable for the most hygiene requires.



Benefits of Eurovent Hygienic Certification Program

The HAHU Certification sets new industry standard for the following reasons.

- 1. Easy to classified:** Create 1 to 3 star rating that accounts for different hygienic requirements.
- 2. Proven hygienic performance:** Stringent, annual factory and selection software audits.
- 3. One certification:** Eurovent HAHU combines the requirements of multiple hygienic standard (e.g. VDI6022-1, DIN1946-4, HTM) in single programme - bringing an end to international standard of requirement.

For Eurovent HAHU, independent factory and software audits are performed annually by Eurovent Certita Certification as an accredited 3rd party.

The air handling unit definition:

A factory-made encased assembly consisting of a fan or fans and other necessary equipment to perform one or more of the functions of circulating, cleaning, heating, cooling, humidifying, dehumidifying and mixing of air.

The hygienic air handling unit definition:

The air handling unit where suitable for using in the sensitive sterile condition.



PTP-H Hygienic Certification



PTP-H testing requirement according to H-AHU Certification program

- EN ISO 846
- EN ISO 2896:2001
- EN 10088-3
- DIN 1946/4 to 6
- EN 779
- EN 1822
- EN ISO 12944-2
- EN 1886
- EN 13053
- EN DIN 1751

Evaluation of the action of Microorganism
Rigid cellular plastics - Determination of water absorption
Standard 1.4301 / AISI 304 for stainless steel
Design of steel structures for corrosion resistance
Aluminium and coating properties
Standard for Medium and fine filters
Standard for High efficiency filters
Standard for corrosion resistance
Mechanical Performance of AHU
Rating and Performance of AHU
Standard for Damper and Valve

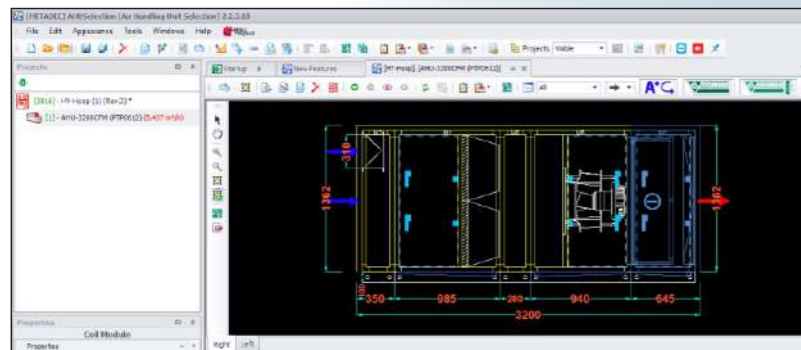
PTP-H comply with additional code of practice

VDI 6022-1
DIN 1946 part 4

Hygiene and Hygiene inspections of HVAC system
Ventilation and air conditioning part 4 in health care area

HTM 0301
EN13053 Section 7

Heating and Ventilation of health sector buildings
Extended hygienic requirement in air handling unit



Certified Selection Software

Selection software is able to communicate and identify each requirement to compliance hygienic level 1 to 3. If the unit shall not be selected follow as the requirement, the selection software is not acceptable as the hygienic unit.

Product Features

Certification

PTP-H range of air handling unit can be configured as a certified HAHU requirement of Eurovent Hygienic AHU Certification program (ECP HAHU). All range has been audited and certified by ECP, a well-known European HVAC Certification program.

3rd Star Hygienic

BENDIG : PTP-H can be manufactured the air handling unit cover the range from single star to 3-rating (3 stars is suitable to most critical hygienic application).

Material and Components

Materials and components in PTP-H are certified in accordance with HAHU, Metallic and non-metallic surfaces are without formation of bacterial growth.

Mechanical Performance of PTP-H : EN1886

Casing Leakage Rate	L1/L1
Thermal Bridging Factor	TB1
Casing strength	D1
Filter bypass leakage rate	FBL9

All materials test action of microbe follow as EN ISO 846

Method A	<1
Method C	<1



PTP-H Hygienic design concept

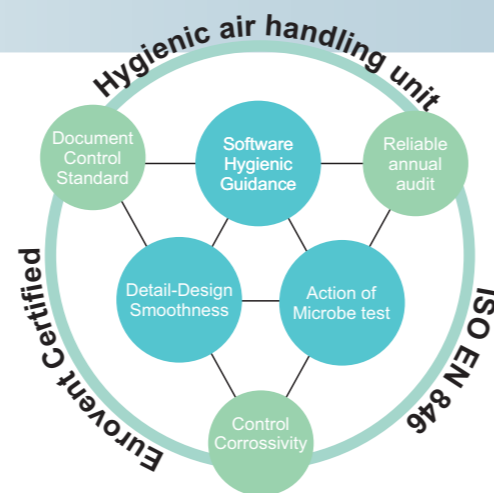


Above: Eurovent Expert team was inspecting PTP-H according to RS of HAHU in Thailand 2019. The detailing design of unit such as maximum gap between panel and structure frame -works, opening access for service, material corrossivity report were evaluated and certified PTP-H range.

Design concept:

“Minimize residue and growth of Microbe inside of Hygienic AHU.”

To obtain certificate for BENDIG PTP-H, Metadec had studied relating Hygienic-Guideline for air handling unit. The relating standard includes: HTM-2025 from UK, VDI6022 and DIN-1946-4 from Germany, and EN-13053 section-7 of European Normative of Euro zone. Each of technical guideline has its own strong points. Eurovent has rearranged the necessary requirements from those and other related guidelines and puts in 69 requirements ordering. For example, Software Hygienic Guidance option in selection software, Detail development inside of AHU and Microbial test. The software guidance shall be help selector maintain the rules of Hygienic requirement and generate document for involving people such as designer, installer and owner. The Detail-development and Microbe test make user confidence that the microbial must be negative growth in any air steam contact parts. Finally, the important part of certification is annual audit, which make system reliable and make sure the different of PTP-H model from standard AHU in view of Hygienic. Overall BENDIG PTP-H is designed to minimize residue and negative growth of microbe inside of unit. They are more suitable for sensitive sterile area.



Benefits of 3-Stars Hygienic

1. International Standard requirement:

BENDIG PTP-H model meet the 3-Stars class in HAHU Certification program according to RS of ECP. This superiority compound with several features for instance, selection software, detailing-design of the AHU, exceptional test result of En1886, material contact with air steam shall be tested EN ISO 846, and so on. These features confidence customer and let easily to choose the most suitable unit for their project.

2. Excellent class of EN1886:

AHU certified 3-Stars Hygienic must be reach classification. BENDIG PTP-H meet best of class as below detail.

Casing Performance	Requirement		
	Level-1	Level-2	Level-3
	★	★ ★	★ ★ ★
Thermal Bridging Factor	TB3	TB3	TB2
Casing Leakage rate (MB)	L2	L2	L1
Casing Leakage rate (RU)	L2	L2	L1
Filter Bypass Leakage	FBL8	FBL8	FBL9

3. Suitable application

- Operation Theatre and similar sensitive area
- Cleanroom and liife-science area
- Pharmaceutical plant

Flexible solutions with regards to filtration stages as per customer needs. Factory assembled modules can be easily installed at site & eliminates site assembly issues.

Clean rooms can encompass numerous applications, everything from operating theatres to laboratories. BENDIG PTP-H range of air handling units can satisfy all requirements relating to healthcare, whether these have to do with air cleanliness, noise levels or demand control.



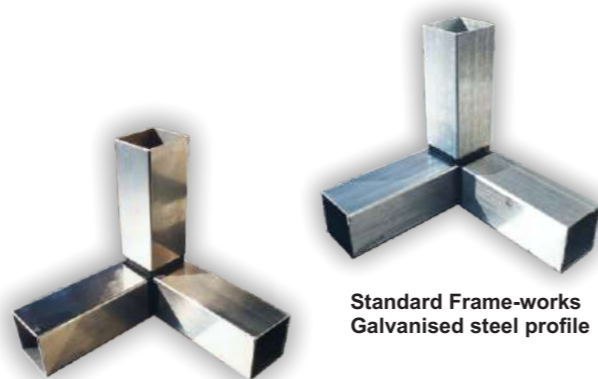
Smoothness design surface



BENDIG PTP-H model:

Above: BENDIG PTP-H, develop detail inside of AHU which create smoothness surface help to increase clean ability and microbe removal, this make unit better in view of hygienic. The design try to eliminate microbe residue area inside of AHU such as Maximize gap control distant, smoothness surface and all compartments possible to be access for cleaning and maintenance purpose.

Right: The structure and frame work of BENDIG PTP-H comply with EN ISO 12944 Classification C3 as our standard. For better corrosion resistance the frame work class C4 and 5 can be requests as an optional. All joints parts of BENDIG PTP-H also comply with EN ISO 846 Method A and C which make sure microbial control and certified by Eurovent HAHU certification program.



Optional Frame-works
SUS304, 316 and 316L

Standard Frame-works
Galvanised steel profile

Above (1st from Left): Access panel opening area comply with requirement from RS-6C-001,6C-005.

Above (Right): Access panel seal comply with EN ISO 846 with push-fit design concept.

Above (2nd from Left): Thermal-Break panel thickness 50 mm Insulation non-combustible materials comply with EN13501-1 reaction to fire testclassification A1.

Above (3rd from Left): Optional volume damper guarantee air tightness according to DIN 1946 class 4.

Above: BENDIG PTP-H, Metallic material shall be comply with ISO EN 12944 classification C3 or better. This enhance confident in longer life-span of metallic surface inside of AHU.

Energy Saving product

Heat pipe

PTP-H model is able to combine with energy recovery such as Heatpipe and Plate heat exchanger. For heatpipe, either horse-shoes or mono-flat are available for Hygienic AHU.

Plate Heat Exchanger

Plate heat exchanger also optional for energy recovery in air handling unit. We available for single air steam and double air steam base on application requirement.



Volume damper accordance with DIN EN 1751 Class-4. The ISO EN 846 also as an optional

Comparison of HAHU and others technical guidelines

Our company began study relating technical guideline of Hygienic requirements for Air Handling Unit since September 2016. We had selected three technical guidelines such as VDI6022, DIN1941-4 and HTM 2025. To compare with one certification, HAHU of Eurovent Certification program. Below is comparison table which ease to understand. Some of them are not appropriate for air handling unit. They are focus on HVAC system. Therefore BENDIG Air Handling Unit PTP and PTP-H range are being produced base on requirement of EN13053 section - 7 (Extended high-hygienic requirements in air handling unit) as our standard product. For enhance owner and designer confidence, certification from 3rd-party such as HAHU from Eurovent also ready as an option.

	Eurovent Certified Performance for Hygienic Air Handling Units (ECP HAHU)	VDI 6022-1	DIN 1946-4	HTM 2025 (example of a national requirement in the UK)
Application areas	All application areas are covered through 3 star rating (3re star = most critical hygienic application areas)	Mainly hotels schools/universities,offices retail stores,non-critical hospital applications and the like	Critical applications in the health sector,such as hospitals,dialysis centres,operating theatres,cleanrooms and the like	Health sector buildings
Market recognition	Global,except North America	Mainly German-speaking markets and Central Europe	Mainly Europe	Mainly United Kingdom and some Commonwealth countries
Unit must have the Eurovent Certification for AHUs as a basic requirement	Yes,this constitutes an additional quality criteria	No	No	No
3 rd party selection software audit	Yes,annually	No	No	No
Selection software must propose hygienic option and allows display of hygienic guidance for selector	Yes	Not specific	No dedicated software requirements	No dedicated software requirements
Annual 3rd party factory audit	Yes	Not specific	No	No
Combines different standards and guidelines into one	Yes,includes requirements defined VDI 6022-1DIN1946-4 and other national standards,such as HTM 2025	No	No	No
Offers different levels to suit different building types and needs	Yes,easy to understand 3-star rating reflecting different hygienic demands	No	Yes,but only aimed at more critical hygienic requirements for surgery rooms (Leve 1 a and 1b)and hospital areas (Level2)	No

