



ATEX

Ventilation and
Air Conditioning in
Explosive Areas

robatherm

the air handling company





ATEX.

When the Air Gets Dangerous.

The ATEX directives oblige consultants, contractors and users to provide personal and property protection from explosion hazards.

Sometimes, even air is dangerous. More often than one imagines, mixtures of air and inflammable substances, such as gases, vapours, mists or dust arise under atmospheric conditions. If a potential ignition source such as friction, electrical discharge or heat is present, there is the risk of an explosion. These atmospheric conditions are summarised in the acronym „ATEX“ standing for „atmosphères explosibles“.

Atmospheres which can become explosive (ex-atmospheres) may be present during normal operation or in case of accidents or failures. It may be present during normal operation in cases where inflammable substances are stored, conveyed, processed, filled, decanted, used for cleaning, production or are generated in the production process. Ex-atmosphere may arise where adhesives or paints are drying out, in the vicinity of fermentation tanks or where substances are being grounded. In breakdowns, explosion atmospheres can arise where defects occur – for example in case of defective gas lines, unprotected openings of an outlet valve or leaks in a boiler.

In industrial sectors, where chemicals and gases are handled, such as laboratories,

chemical and petrochemical industries, power supply companies as well as waste disposal and recycling operations one can, as a rule, assume that ex-atmospheres may arise.

The overall responsibility for the safety of buildings and its facilities is down to the builder and the operator. Since 2003 European law makes compliance compulsory under Directive ATEX 137 for operators and under ATEX 95 for manufacturers, and regulates which measures are to be planned in order to avoid hazards.

This gives a clear basis for design, implementation and operation.

Where an ex-atmosphere is concerned, room air conditioning units stand out with regard to hazard potential, as the atmosphere flows through them or surrounds them and they contain certain components that are potential ignition sources.

robatherm is one of the few manufacturers of AHUs who have experience of ATEX and who design and build units that comply with ATEX 95 and which have an ATEX-declaration and a TÜV-confirmation.

‘ATEX’ stands for ‘Atmosphères Explosibles’, atmosphere capable of exploding.

ATEX Directives describe measures for explosion protection.

ATEX Directives are binding on operators, planners and manufacturers.

ATEX 137 covers regulations for plant operators.

ATEX 95 covers regulations for equipment manufacturers.

ATEX Conformity. In Practice.

Advisers, factory inspectorates, health and safety authorities as well as the TÜV support analysis, design and implementation.

The installation conditions determine the category of the AHU required.

Explosion group and temperature class are determined by the gases occurring.

AHUs are subjects to the Machine

Directives. In addition, they need to comply with the ATEX regulations, if:

- Ex-atmosphere can arise in the room where the unit is installed and/or
- Ex-atmosphere is handled.

AHUs are not applicable for:

- Dusty atmospheres (Unit category 1D, 2D or 3D; i.e. Ex-Zone 20, 21 or 22), since AHUs are not dust removal facilities in the meaning of VDMA 24180.
- Unit group I, i.e. use in underground operations in mines with firedamp.

- Unit group 1G (ex-Zone 0), since two independent protection devices shall be effective (e.g. an ATEX unit additionally encased in a concrete box).

The classification of AHUs comes from the installation location – here it is key whether the AHU is installed inside or outside the ex-zone (see figure) – the gas explosion group and the temperature class.

A differentiation is made between the ex-zone inside and the ex-zone outside. If the unit is assembled inside the ex-zone, there are ex-protection requirements in- and outside the unit. In case, it is assembled outside the ex-zone, the medium handled dictates the requirements. Carry-over of ex-gases e.g. through unit’s doors needs to be considered. Back flow of air during shut off periods needs to be avoided at all costs, e.g. by air tight dampers.

As a matter of principle, the two categories (ATEX zones) inside and outside must not differ by more than one class. Where no external ATEX zone has been defined, the operator shall ensure sufficient ventilation of the installation

Ex-zone (according to DIN 50281-1-2)		
Ex-zone 0	Ex-zone 1	Ex-zone 2
Ex-atmosphere occurs constantly	Ex-atmosphere occurs occasionally	Ex-atmosphere occurs seldomly

Disposition and category of unit						
Supply air						
Unit inside	2G	3G	2G, 3G*	3G, n.r.*	2G, n.r.*	3G, n.r.*
Unit outside	2G	3G	3G	n.r.	n.r.	n.r.
Extract air						
Unit inside	2G	3G	2G	3G	2G	3G
Unit outside	2G	3G	3G	n.r.	n.r.	n.r.

Ex-zone 1 ■ Ex-zone 2 ■ No ex-zone ■ Exterior area ■ * Back flow prevented n.r. = no requirements

Classification of robatherm units

CE Ex II 2 G IIB - T4

CE Ex Unit per ATEX Directive 94/9/EU

TUV SÜD EU conformity certification
TÜV Süd
TPS 05 ATEX 2 128 X

II II for Unit Group II

2 2 for Unit Category 2 or 3

G G for G = gas

IIB IIB for gases of Explosion Group IIA or IIB

T4 T4 for gases of Temperature Group T1, T2, T3 and T4

space so as to prevent the formation, during normal operation, of potentially explosive atmospheres due to leakages. Rooftop units which are usually surrounded by normal atmosphere (no ATEX zone) posing no explosion hazard are an exception. The results of a risk analysis, evaluation of the ignition hazard, unit description, calculations and tests have to be demonstrated.

Applying ATEX 95 to AHUs, secondary explosion protection is the highest priority. The objective of these measures is to prevent ignition.

Ignition sources can be either mechanical, e.g. by friction of the fan impeller on the inlet nozzle, or electrical at switches. Copper inlet nozzles and ATEX conforming electrical installations provide some remedy. Another problem is static loading, e.g. on droplet separator profiles, inspection glasses or flexible connections. 2G surface restrictions apply to plastic parts.

All parts shall have a metallic connection or contact to the grounded unit base frames.

A qualified lightning protection system shall be installed to protect against lightning strokes. Further potential ignition sources are hot surfaces on components, such as fan bearings, motors, air heaters etc., were the surface temperature needs to be correspondently limited.

ATEX units are fitted with filters of at least Class F5 at the unit intake to avoid ignition sources arising from dust accumulation, if they are not operated with fine dust filtered air.

Classification and identification					
Units per ATEX Directive	Unit group	Unit category	Atmosphere D = dust, G = gas	Explosion group	Temperature class
CE Ex	I	AHUs are not designed for use underground			
		1	Only with second protection device		
	II	2	D	Not for dusty atmospheres	
			G	IIA	T1 - T4
				IIB	
		3	D	Not for dusty atmospheres	
			G	IIA	T1 - T4
				IIB	
				IIC	Not for AHUs

Modular and Flexible. robatherm Solutions.

Certified safety without compromising flexibility, economy, hygiene or controllability.



Flexible configuration, variable dimensions.

Outstanding energy efficiency.

Excellent hygiene, maintenance friendly and easy to clean.

Integrated control technology.

Tested safety.

Based on the robatherm modular AHU programme, ATEX units have been designed with TÜV certified protection provisions which are perfectly adapted to the requirements of the respective application.

ATEX units are available in the following designs

- Interior units
- Weatherproof units
- Units meeting extended hygiene demands.

The outstanding energy efficiency of robatherm units is not at all affected by the ATEX configuration.

ATEX units, equipped with high standard components, meet the highest energy efficiency classes according to both, the RLT Regulation 01 of the German Association of Manufacturers of Room Air Conditioning Units and the European certification agency EUROVENT. This guarantees efficient operation and lowest life cycle cost.

Inside the ex-zone we only use sensors, actuators and further electrical equipment which is

EU Type tested according to the ATEX Directive.

Constant quality

and safety of ATEX units are guaranteed by individual tests and independent external inspections by the TÜV. This emphasises our professional approach.

If it comes to hygiene, maintenance friendliness and ease of cleaning, ATEX units meet the wellknown level of all



robatherm products. All hygiene characteristics are evaluated and testified by the Institute of Air Hygiene (ILH) in Berlin.

Casing

The modular casing design covers the capacity range from 1,000 to 320,000 m³/h. Height, depth, and length are based on the modul's dimension of 102 mm. The properties of the casing are TÜV tested. The numbers for heat trans-

mission, thermal bridges, housing leakages and others are outstanding. A conductive powder coating or stainless steel ensures a high protection against corrosion and a long lifetime.

The physical properties of the unit's casing are according to DIN EN 1886:

- Heat transmission: Class T2
- Thermal bridges: Class TB2
- Leakage: Class L1 (M)
- Filter bypass leakage: Class F9
- Casing deflection: Class D2

Convincing Details.

Seamless integration:

Components according to ATEX

Certified components for every configuration.

High reliability.

Flexible configuration.

Tested safety.

The use of especially designed components is a pre-supposition to keep the conformity to the ATEX directive.

Grounding of the unit

To avoid any static loading, all parts are grounded and special conductible powder coating is used. (RAL colour 7024).



Flexible connectors

The flexible connectors are made from conductible material. Each connector comes with an equipotential bonding.

Air filters

Air filters have conductible filter media (Filter Class G3 to H13). The filter frames are powder coated. Stainless steel is available as an option.



Fans

Direct driven plug fans with horizontal or vertical axles, as well as direct or belt driven spiral housing fans are available. Spark formation is positively prevented by special material pairing for fan propellers and fan intake nozzles. Belt driven fans are equipped with conductive drive belts. Motors are protected against explosions with enhanced safety: each has a EU type test certificate according to the ATEX Directive.

Droplet separators

Droplet separators are removable for cleaning, mounted in extractable stainless steel frames and have conductive aluminium profiles (2G).

Dampers

Dampers with blades, mounted in brass bearings. The grounded blades are interconnected with gear wheels or outside levers. As a standard, the dampers meet Tightness Class 1 to 4 according to DIN EN 1751.

Silencers

The silencers are covered with fibreglass and perforated metal sheet preventing abrasion and static loading.

Heat recovery systems

Special plate heat exchangers with ATEX-compliant bypass dampers, or closed-circuit systems for separate airflows to prevent leakages and any carryover between zones. Heat exchangers are electroconductive.

Switch/Lights

Lighting, repair switches and the entire light installation is according to ATEX directive. Only certified components are used.



Best Choice. Best References.

Trust and confidence emerge from quality.

That is why many well-known companies favor robatherm's solutions.



**Automobile
Industry**

**Chemical and
Pharmaceutical
Industry**

**Commercial
Building**

Electronic Industry

Hospital

Production

Automobile Industry Alfa Romeo, Audi, BMW, Bugatti, Citroen, DaimlerChrysler, Ford, General Motors, Honda, Iveco, John Deere, KIA, Michelin, Opel, Peugeot, Porsche, Renault, Rover, Scania, SEAT, Skoda, Suzuki, Toyota, Volkswagen, Volvo

Chemical and Pharmaceutical Industry 3M santé, BASF, Bayer, Beiersdorf, Boehringer, BP, Degussa, Du Pont, Fraunhofer Institut, Fresenius, Glaxo Smithkline, Höchst, Institut Pasteur, Krupp, Linde, L'Oréal, Labo Piette, Merckle, Merial, Osram, Pfizer, Procter + Gamble, Roche, Sanofi, Schering, Solvay, Thomae, Urengo

Commercial Building Allianz, Commerzbank, Crédit Agricole, Deutsche Bahn, Deutsche Bank, Disneyland, Dresdner Bank, ECE, H&M, IKEA, Interspar, Mediamarkt, NATO, RWE, SAP, Semperoper Dresden, Flughafen Tel-Aviv, TU Dresden

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