TROX® TECHNIK
The art of handling air

Additional information on the declaration of conformity of the air handling unit using of single-split outdoor units with A2L refrigerant R32.

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1. Appropriate usage

The use of an A2L refrigerant (non-toxic, flame retardant) requires a risk assessment according to DIN IEC 60335-2-40 ("Safety of household and similar electrical appliances - Part 2-40: Particular requirements for electrically driven heat pumps, air conditioners and dehumidifiers").
The risk assessment includes measures to reduce the risk of the formation of an ignitable air-refrigerant mixture to an acceptable level.

The air handling unit series X-CUBE or X-CUBE X2 can be used appropriately if the requirements of safety zone A according to DIN IEC 60335-2-40 (see 2. "Definition of safety zone A") as well as the supplementary requirements mentioned under 3. are met.

For simplification, the required room sizes and min. air volume flows of safety zone A are shown under 4. in relation to exemplary refrigerant charge quantities.

If the minimum requirements (see 2. and 3.) are met, sufficient measures have been taken to meet the requirements of the risk assessment.

2. Definition of safety zone A according to DIN IEC 60335-2-40

Safety zone	Max. refrigerant charge	Min. air volume flow	Required safety measure
A	• Charge ≤ 1,8 kg OR • $m_{max} \leq 2{,}5 * LFL^{1{,}25} * h_0 * A^{0{,}5}$ • Maximum 15,96 kg	$\dot{V}_{min} = 60 * \frac{m_{max}}{LFL}$	No measure required

h0 [m]	Air outlet installation area
0,60	Floor
1,00	Window
1,80	Wall
2,20	Ceiling*

*If ceiling height > 2,20 m choose 2,20 m for the calculation.

Key figures R32:

- LFL = 0,307 kg/m³
- Autoignition temperature = 530,00 °C

Legend:

- LFL = Lower flammability limit [kg/m³]
- h_0 = Height of air outlet of smallest, ventilated room [m]
- A = Area of the smalles, ventilated room [m²]
- $\dot{V}_{min}$ = min. operating volume flow of AHU [m³/h]
- m_{max} = max. charge of one closed refrigerant circuit [kg]

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3. Further conformity requirements of the AHU and the duct system

Special precautions with regard to the design of the air handling unit and the duct system apply to the supplementary risk minimisation. These precautions are necessary for compliance.

The AHU is already delivered by the manufacturer with the necessary measures. The precautions must also be observed after delivery.

Design of the air handling unit	Desing of the duct system
• AHU is located outdoors • Single-split outdoor units are located outdoors • Piping between AHU and single-split units completely outside the building • No operating ignition sources available (e.g. switches / relays) • No surface temperatures > Auto-ignition temperature R32 - 100 K = 430°C • Heat exchanger consists of several separate cooling circuits • One single-split outdoor unit is installed per cooling circuit	• No operating ignition sources available (e.g. switches / relays) • No surface temperatures > Auto-ignition temperature R32 - 100 K = 430°C

4. Exemplary air volume flow and room area related to the refrigerant charge

In the case of several separate closed refrigeration circuits, only the charge weight of one circuit is to be used for the calculation to determine the min. volume flow and the max. room area. The refrigerant charge per circuit is shown on the technical data sheets of the air handling units.

		Min. area smallest, ventilated room according zone A			
R32 charge of one circuit	Min. air volume flow zone A	h0 = 0,6 m	h0 = 1,0 m	h0 = 1,8 m	h0 = 2,2 m
2,00 kg	400,00 m³/h	34,10 m²	12,30 m²	3,80 m²	2,60 m²
3,00 kg	590,00 m³/h	76,60 m²	27,60 m²	8,60 m²	5,70 m²
4,00 kg	790,00 m³/h	136,20 m²	49,10 m²	15,20 m²	10,20 m²
5,00 kg	980,00 m³/h	212,80 m²	76,60 m²	23,70 m²	15,90 m²
6,00 kg	1180,00 m³/h	306,40 m²	110,30 m²	34,10 m²	22,80 m²
7,00 kg	1370,00 m³/h	417,10 m²	150,20 m²	46,40 m²	31,10 m²
8,00 kg	1570,00 m³/h	544,70 m²	196,10 m²	60,60 m²	40,60 m²
9,00 kg	1760,00 m³/h	689,40 m²	248,20 m²	76,60 m²	51,30 m²
10,00 kg	1960,00 m³/h	851,10 m²	306,40 m²	94,60 m²	63,30 m²