reventon
INDUSTRIAL SOLUTIONS

AIR WATER HEATERS & DESTRATIFICATION FANS

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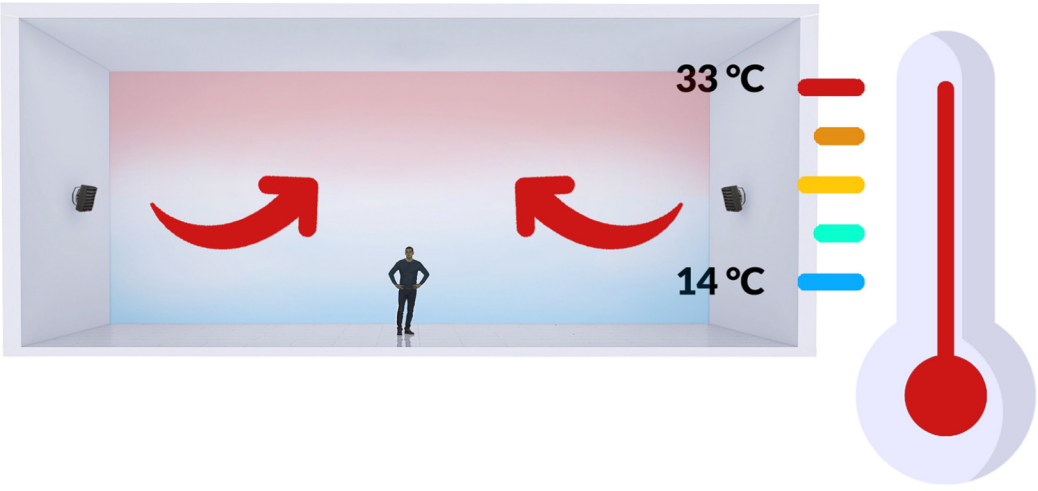
HOW TO USE THEM TOGETHER

See the benefits of using both devices from our offer.

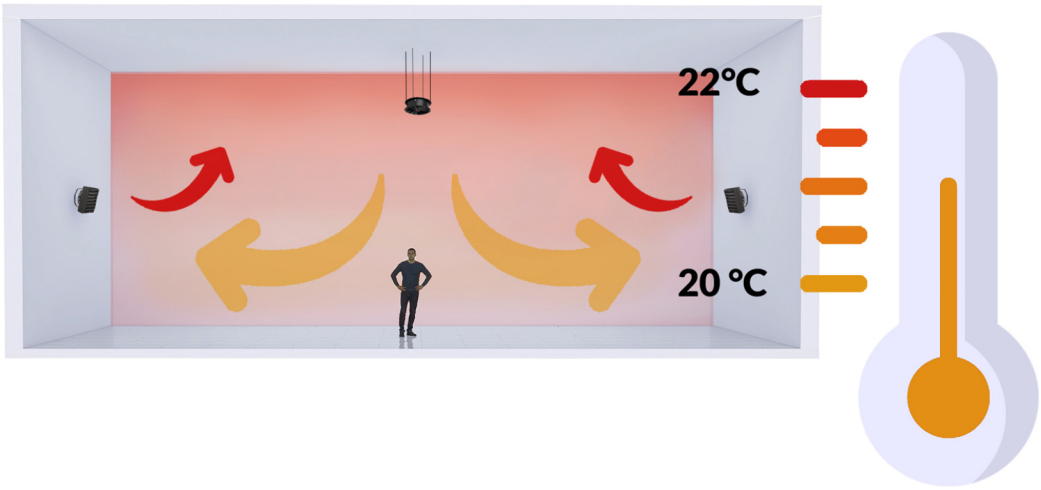
HOW TO USE THEM TOGETHER?

The problem with heating of high room is that the warm air escapes up due to its lower density, comparing to the colder air. It causes that the room heat up from the ceiling to the floor and the highest air temperature would be always in the roof zone. As for the thermal comfort of building's users only the temperature in the zone from the floor up to about 2 m of height is important (so called the human occupied zone), these phenomena are undesirable. The solution of this problem could be destratification fans, as they throw the warm air down again, directly to the human occupied zone.

Temperature distribution **WITHOUT** the use of **DESTRATIFICATON FAN.**



Temperature distribution **WITH** the use of **DESTRATIFICATON FAN.**



DESTRATIFICATION FANS

The destratification fans circulate warm air from the ceiling area to the human occupied zone. So in a sense, they limit an undesirable phenomena of vertical temperature gradient. This way of using the device allows for effective utilisation of the supplied air, providing thermal comfort of people staying in the building.

TORNADO SERIES

	UNIT	TORNADO XS1	TORNADO XS2	TORNADO XS3	TORNADO XS4	TORNADO XS5	TORNADO XS6
PRODUCT CODE		DTXS1-1965	DTXS2-1966	DTXS3-1967	DTXS4-1968	DTXS5-1969	DTXS6-1970
MAXIMUM AIRFLOW	m^3/h	2200	3600	4500	6400	6750	10200
MAXIMUM VERTICAL AIR RANGE	m	6	8	9	11	12	15
VOLTAGE /FREQUENCY	V/Hz	230/50	230/50	230/50	230/50	230/50	230/50
NOMINAL MOTOR CURRENT	A	0,65	0,82	1,15	1,75	1,75	2,90
NOMINAL MOTOR SPEED	rpm	1420	1380	1350	1320	1380	1300
NOMINAL MOTOR POWER	W	126	180	250	380	385	660
IP PROTECTION RATING OF MOTOR	–	54	54	54	54	54	54
NET WEIGHT	kg	7,1	8,3	10,6	13,6	16,8	23,0
NOISE*	dB	52	55	57	59	59	62

* the measurement at the distance of 5 m from the device

HC-3S SERIES in EPP

	UNIT	DESTRATIFICATOR HC–3S		
PRODUCT CODE		DHC-3S-1766		
MAXIMUM AIRFLOW	m^3/h 3 stage/2 stage/1stage	4600	3900	3100
MAXIMUM VERTICAL AIR RANGE	m 3 stage/2 stage/1stage	10	8	6
VOLTAGE /FREQUENCY	V/Hz	230/50		
NOMINAL MOTOR CURRENT	A 3 stage/2 stage/1stage	1,08	0,86	0,70
NOMINAL MOTOR SPEED	rpm 3 stage/2 stage/1stage	1360	1050	750
NOMINAL MOTOR POWER	W 3 stage/2 stage/1stage	240	190	160
IP PROTECTION RATING OF MOTOR	–	54		
NET WEIGHT	kg	11,5		
NOISE*	dB 3 stage/2 stage/1stage	61	56	52

* the measurement at the distance of 5 m from the device

CASE STUDY

One of our clients was wondering if installation of destratification fans in the hall with dimensions 100 x 50 x 15 m and the average heat transfer coefficient equal 0.3 $W/m^2 \cdot K$ is economically justified (i. e. if it will provide savings by reduction of the hall heat load). So we decided to use this example and show whether the installation of these devices is an cost-efficient investment or not. To check it, we considered two variants i. e. without destratification fans (in this variant, the vertical temperature gradient equal 0.8 K/m was assumed) and with these devices, installed at the height of 11 m (in this case the assumed vertical gradient was 0,1 K/m). To ensure the recommended number of air changes above the destratification fans (i. e. 6 times area above the fans per hour), we recommended the usage of 8 x TORANDO XS 5. The calculations were made for the design air temperature in the human occupied zone equal 16 Celsius degree. For the sake of simplicity, we have ignored the heat gains in the hall, ventilation losses and an impact of insolation.

RESULTS

In the variant without destratifiers, the heat load is approximately 152 kW. The use of TORNADO series units changes the air distribution, so that approximately 129 kW is enough to maintain the required temperature in SPL. The largest gain is related to the reduction of losses through the roof from approximately 62 kW to approximately 46 kW.

CONCLUSIONS

The usage of the destratification fans in the analysed case reduces the hall heat load by approximately 15%. The main reason of it is reduction of the roof losses by about 26%. It is related with the throwing hot air down and decreasing of air temperature in the roof zone.

USE THEM TOGETHER

Now you know the benefits of using both devices.