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PST sound reduction

Optimum sound reduction system for Chillers

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Optimum sound reduction system for Chillers

GK… 404-S Chillers have a relatively low sound level because they are designed and serially equipped with a suction-type sound absorber. In order to be able to operate these devices in a more environmentally-friendly manner, the additional sound reduction system PST (Particular Silent Task) was developed.

It consists of five individual elements, which can be used both individually and as a complete entity. Fig. 1 shows the complete PST sound reduction system.

Tried and proven pyramid-shaped double-layer insulating panels were used as the insulating media for the flat elements. All the parts that make contact with the air have reliable perforated plate cascades, which are filled with heavy insulation flakes. This makes a short design feasible.

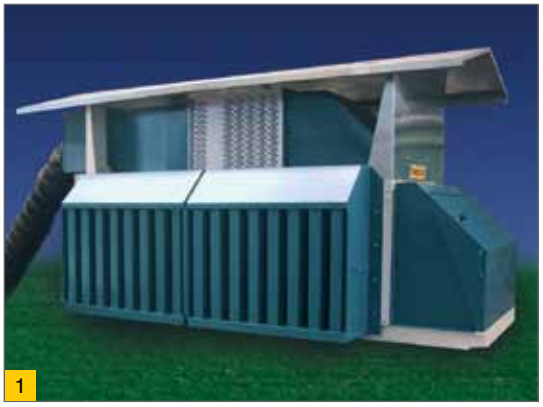

fig. 1: Chiller with complete PST sound reduction system

Ausstattung	**Schallleistungspegel [db(A)] in 7 m Abstand bei Messpunkt**								**Arithm. Mittel**
Execution	**Noise level [db(A)] in 7 m distance at measuring point**								**Average**
	1	2	3	4	5	6	7	8	dB(A)
Grundgerät Basic unit	65,5	68,5	69,5	69,5	70,0	71,5	71,5	67,5	69,18
Mit Teil 1, 2 und 3 With part 1, 2 and 3	65,0	65,5	68,0	68,5	67,0	70,0	70,0	67,0	67,62
Mit Teil 1 - 3 und 4 With parts 1 - 3 and 4	64,0	64,0	63,5	66,0	66,0	71,0	70,0	66,0	66,31
Mit Teil 1 - 4 und 5 With parts 1 - 4 and 5	62,5	62,5	63,5	64,5	64,0	67,5	66,0	63,5	64,25

chart 1: Sound power L_{WA} for GK 80/404-S including and excluding PST

In fig 3, the directions of the eight measuring points are indicated. The measurements were taken outdoors at a distance of 7 meters. This measuring distance is chosen for Chillers as a normal distance in order to be able to carry out comparisons. Chart 1 shows these test values for the Chiller GK 80/404-S, as they apply to the respective measuring points.

Chart 2 can be used to determine the reduction in the sound level in relation to the distance (e.g. to the next apartment house). An immission site in the built-up area, e.g. 80 m away from the Chiller. The emission of the basic unit at measuring point 2 equals 65.5 dB(A) according to chart 1. What measures can be taken?

According to the diagram in chart 2, the sound level L_{wa} is reduced by ΔL = 19.5 dB(A) at a distance of 80 m. Thus, the immission site for noise level L_s 68.5 – 19.5 = 49 dB(A). Now, if the cold air noise absorber (Part 3) is installed, the value drops to 65.5 – 19.5 = 46 dB(A). Compliance with the 45 dB(A) required in VDI 2058 for mixed-use zones is not reached with this. Additional elements are required. When using PST elements, in particular, the emission not only drops to below the required value for measuring point 2, but the mathematical average also drops: 64.25 – 19.5 = 44.75 dB(A)

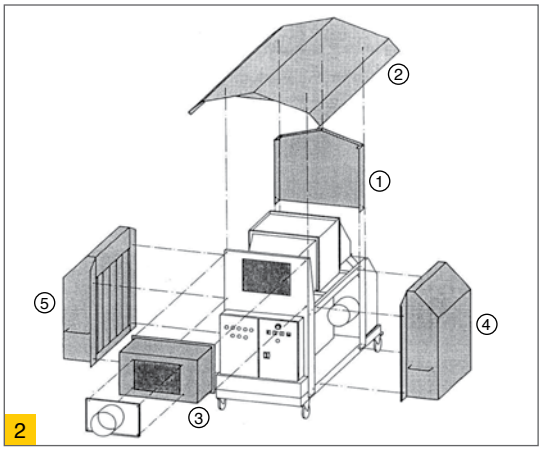

fig. 2: PST sound reduction elements

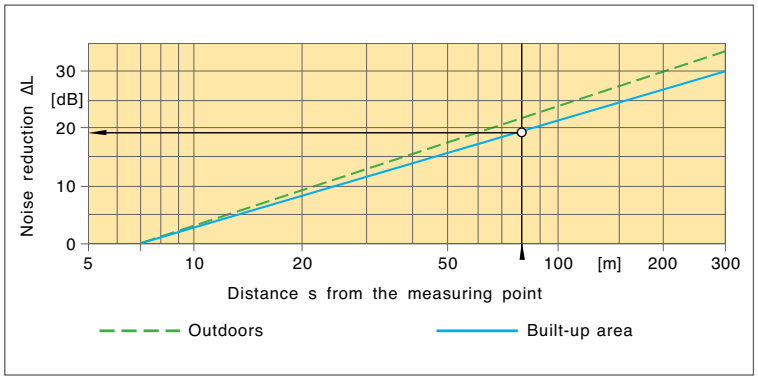

chart 2: Reduction in the noise level L_s depending on distance s

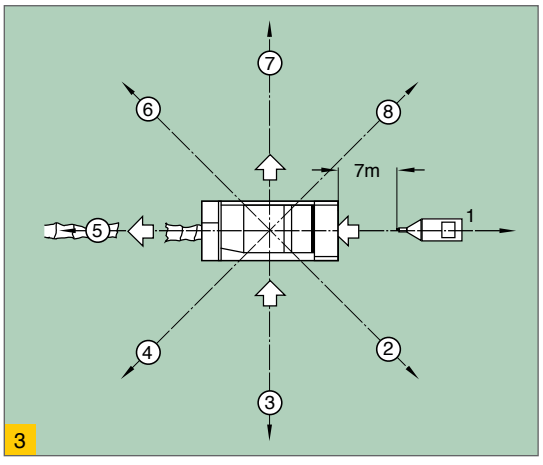

fig. 3: Test layout and position of measuring points

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Issue 25.09.07 Nr.001 | GS-ChillingTechnology - PST sound reduction-CS001 | DESIGN@BOHL.DE