Product description

MTC – Reactive supply air diffuser

Introduction

MTC is a reactive and circular ceiling mounted supply air diffuser intended for ventilation on demand with room climate control unit DCV-RC. The diffuser's opening level (damper height) is changed with the level of pressure in the duct system.

The diffuser is intended for rooms where several diffusers are working together, such as training premises, conference rooms, open plan offices, foyers etc. The diffuser handles both low and high flows (up to 115 l/s at 30 dBA) with under-temperature air (down to 15 °C) without creating draught problems. Noise generation from ventilation can at the same time be kept at very low levels.

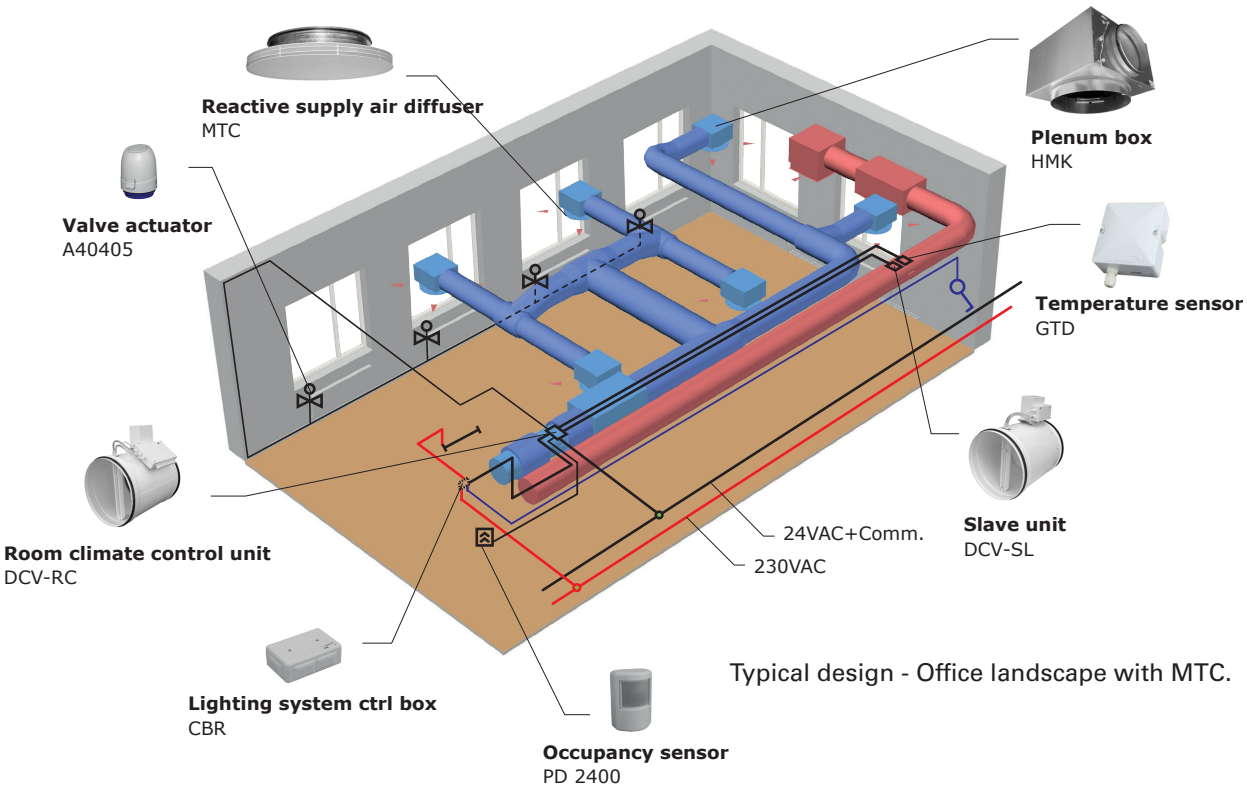
As the regulation exploits the cooling capacity of the outdoor air, energy use can be radically reduced relative to CAV systems with chilled beams.

Unlike the active supply air diffuser, which is equipped with a damper motor and control electronics with sensors, MTC is fully mechanical.

MTC – Reactive, circular, ceiling mounted supply air diffuser.

Function

As a result of the varying opening levels (damper heights), the air speed is maintained from the edge of the diffuser even on low flows so that no cold draughts arise. The air is spread along the ceiling with powerful injections of room air, which means that the air stream has reached room temperature after only 1.5 meters. MTC gives a low noise level throughout the working area.



Typical design - Office landscape with MTC.

MTC – Reactive supply air diffuser

Installation and adjustment

MTC is easily installed in suspended ceiling systems using the reactive diffuser plenum box for hidden installation HMK. For visible installations with MTC, see plenum box HMR. The plenum box can easily be modified to fit active diffusers if the room structure changes.

Both diffuser box HMK and HMR is equipped with an adjustable choke damper. The choke damper is used to distribute the supply air evenly between the diffusers.

The air throw can be reduced in selected sectors by mechanically preventing opening in a particular direction. The adjustment means that flow collisions and impacts between diffusers can be avoided.

MTC installed in plenum box HMK with adjustable choke damper. Diffuser MTC is used with plenum box HMK for hidden installation.

Air flow regulation and climate control

The air flow through MTC is controlled by room climate control unit DCV-RC with room climate controller RCC. The controller can adapt heat from radiators and optional additional cooling from fan air coolers to maintain the desired room climate even during varying occupancy levels.

The air flow can be controlled with great accuracy within an intervall of duct speeds between 0.2-6 m/s.

Technical specifications

General

Dimensions (mm)
Dimensions for MTC are shown in the image on the right. For the diffuser plenum box dimensions, see the product description for HMK or HMR.

Material
Powder-coated aluminium and steel plate.

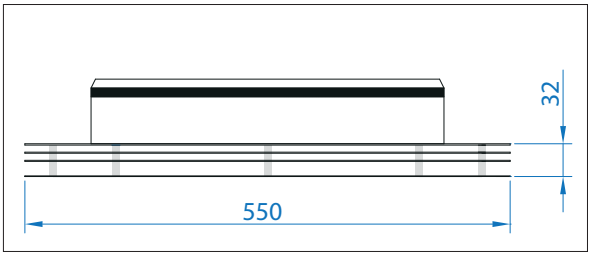
Colour
Standard: RAL9003
Choice of colour can be specially ordered.

Weight
5.4 kg.

Air flow
Flow range: Up to 115 l/s at 30 dB(A). Limits depending on noise requirements according to Diagram 1 on page 3.

Sound output level and internal damping

See page 3.



MTC with width and height in mm on installation in suspended ceiling.

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Pressure, flow and noise levels.

The sound pressure levels L_{PA} in diagram 1 correspond to A-weighted sound levels in the reverberant field with 10 m^2 equivalent sound absorption area. This corresponds to 4 dB room damping in a normally damped room with a room volume of 25 m^3. On the right are examples of corrections for other types of rooms.

Other corrections
Sound output level/octave band: L_w dB
Sound pressure level: L_{PA} dB(A) (read from diagram 1 below)
Corr.: K_0 dB (read from Table 1)

$L_w = L_{PA} + K_0$

Internal damping according to Tables 2-4.
The measurements have been carried out according to ISO 9614-2 and ISO 691:1995.

Diagram 1 below shows pressure over the diffuser and the diffuser plenum box with open or closed choke damper. The lower curve shows the static pressure over the diffuser and diffuser plenum box with open choke damper.

The pressure is measured after the choke damper. This pressure is independent of the setting of the choke damper and is used during adjustment. The total pressure drop over the diffuser and diffuser plenum box is altered by setting the choke damper. The upper curve in the diagram shows the total pressure drop with fully closed choke damper measured in the duct.

Room volume	Room type	Correction
25 m^3	hard room	+2 dB
25 m^3	normal room	0 dB
25 m^3	damped room	-2 dB
150 m^3	hard room	-3 dB
150 m^3	normal room	-5 dB
150 m^3	damped room	-7 dB

Table 1: Correction factor, K_0 [dB]

MTC	Octave band [Hz]							
	63	125	250	500	1K	2K	4K	8K
400	11	12	5	0	-2	-5	-12	-15

Table 2: Internal damping [dB]/MTC with HMK diffuser box

MTC +HMK	Octave band [Hz]							
	63	125	250	500	1K	2K	4K	8K
400	16	12	22	22	23	20	24	25

Table 3: Internal damping [dB]/MTC with HMR diffuser box

MTC +HMR	Octave band [Hz]							
	63	125	250	500	1K	2K	4K	8K
400	12	7	15	12	14	14	16	18

Table 4: Internal damping [dB]/MTC diffuser section only

MTC	Octave band [Hz]							
	63	125	250	500	1K	2K	4K	8K
400	18	16	12	13	14	12	15	18

Diagram 1. Flow, pressure and noise level for diffuser with open and closed choke damper.