

Napomene Silvento ec s komfornom pločom / Notes on the Comfort board of the Silvento ec

Inteligentna regulacija vlage

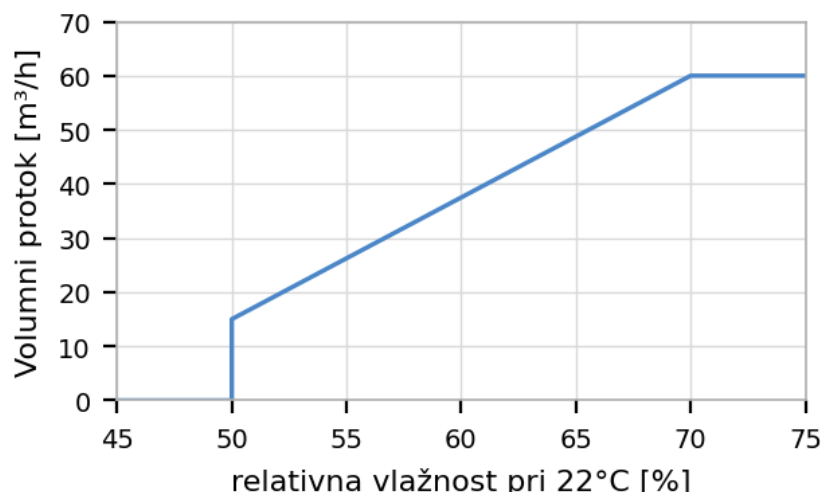
Silvento ec rezultat je dosljednog daljnjeg razvoja jednocijevnog ventilatora. Prelaskom s AC motora na ec motor prijem snage mogao se gotovo prepoloviti, a raspon opterećenja tlačne razlike kao i varijabilnost znatno povećati. Tako se već u osnovnoj verziji Silvento ec protoci zraka za osnovnu ventilaciju i ventilaciju prema potrebi mogu slobodno konfigurirati između 0 m³/h i 100 m³/h te se mogu trajno upravljati putem prekidača i/ili intervalnog rada. Uz konfigurabilnu odgodu uključivanja i naknadni rad, osnovna verzija posjeduje sve funkcije za optimalno odzračivanje u skladu s važećim ventilacijskim normama.

Za razliku od osnovne ploče 5/ZI, komforna ploča 5/FK dodatno raspolaže senzorom vlage/temperature. To omogućuje inteligentan automatski rad koji se optimalno orijentira prema potrebi za ventilacijom u skladu s prisutnim opterećenjima vlagom.

Korišteni senzor mjeri relativnu vlažnost usisanog zraka s točnošću od ± 2 % i temperaturu s točnošću od $\pm 0,2$ °C.

Inteligentna regulacija vlage

Kod tvornički aktivirane inteligentne regulacije vlage, na temelju izmjerenih vrijednosti relativne vlažnosti zraka i temperature, relativna vlažnost zraka preračunava se na 22 °C (normirani uvjet), praktički regulacija prema apsolutnoj vlažnosti zraka. Utvrđena vrijednost zatim služi za regulaciju protoka zraka između 50 % i 70 % relativne vlažnosti zraka pri 22 °C, kako je prikazano na sljedećem grafikonu:



Uključeni stupnjevi pritom ovise o postavci DIP prekidača 1,2 (osnovna ventilacija) i 6,7 (ventilacija prema potrebi). Pri 50 % r.v. (22 °C) ventilator se samostalno uključuje na osnovni ventilacijski stupanj. Protok zraka linearno se povećava s tijekom r.v. sve dok se pri 70 % r.v. (22 °C) ne dosegne ventilacijski stupanj prema potrebi.

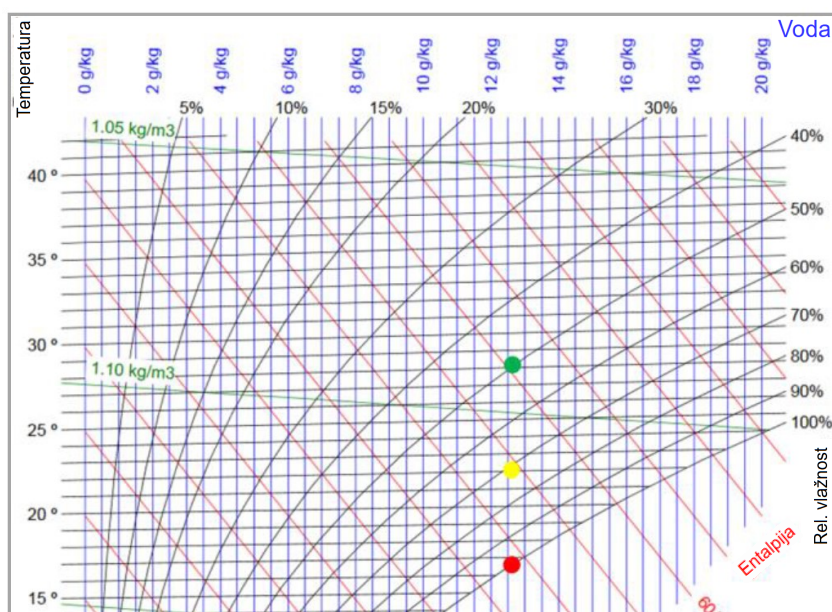
Kako ventilator tijekom ljetnih mjeseci, kada vanjska vlažnost zraka u to vrijeme redovito iznosi trajno 60 % – 70 %, ne bi trajno radio na visokom ventilacijskom stupnju i pritom uvlačio vlagu u stan, Silvento ec s komfornom pločom 5/FK trajno oblikuje klizeću srednju vrijednost relativne vlažnosti pri 22 °C. Ta srednja vrijednost predstavlja osnovnu razinu vlažnosti zraka (pozadinsku vlagu), ispod koje ventilator ne može doći ni pri povišenom ventilacijskom učinku.

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Tek porast vlage od 6 % iznad pozadinske vlage aktivira opisanu inteligentnu regulaciju vlage. Ona se ponovno deaktivira kada se dosegne vrijednost pozadinske vlage + 2 % ili kada se vlaga tijekom razdoblja od dva sata ne može sniziti.

Zašto preračunavanje na 22 °C?

Zbog fizikalnih razloga topao zrak može primiti više vode nego hladan zrak. To za posljedicu ima da je izmjerena relativna vlažnost zraka pri npr. 28 °C znatno niža nego pri 22 °C, čak i ako oba stanja imaju istu apsolutnu vlagu, tj. istu količinu vode u zraku. Ova okolnost može se dodatno pojasniti sljedećim h,x-dijagramom:



Dijagram prikazuje tri stanja zraka koja se istovremeno mogu javiti u stanu. Sadržaj vode u zraku pritom uvijek iznosi otprilike 12,5 g/kg, jer se kroz njega provjetrava cijela korisnička jedinica.

Zeleno označena mogla bi biti kupaoonica koja je uredno zagrijana i u kojoj visi ventilator ukl. senzor. Pri temperaturi od 28 °C mjeri se relativna vlažnost zraka nešto ispod 50 %. Ventilator ostaje isključen ili je najviše na osnovnom ventilacijskom stupnju. Hladnija spavaća soba (žuto, 22 °C) pokazuje relativnu vlažnost zraka od nešto iznad 70 %, tj. vrijednost pri kojoj već postoji najviša potreba za ventilacijom.

Vrlo je loša situacija u nezagrijanom podrumu (crveno, <17 °C). Ovdje je već dosegnuta točka rošenja i na zidu se stvaraju prve kapljice.

Ugrađena inteligencija pouzdano prepoznaje povećanu potrebu za ventilacijom u cijeloj korisničkoj jedinici, neovisno o temperaturi, te može uvelike osigurati zdravu klimu za korisnike i građevinsku supstancu.

Vaš LUNOS tim

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Intelligente Humidity control

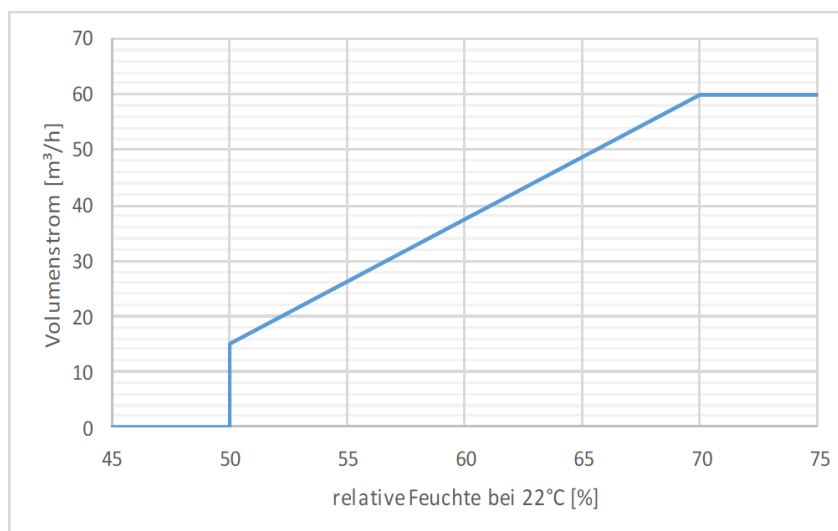
The Silvento ec is the result of the consistent further development of the single-pipe fan. By changing from an AC motor to an ec motor, the power consumption could be almost halved and the achievable total pressure difference and variability could be significantly increased. Even in the basic version of the Silvento ec, the volume flows of the basic ventilation and demand ventilation between 0 m³/h and 100 m³/h can be freely configured and controlled permanently, via switch and/or interval operation. Supplemented by a configurable switch-on delay and follow-up time, the basic version has all the functions required for optimum ventilation in accordance with applicable ventilation standards.

In contrast to the Basic Board 5/ZI, the Comfort Board 5/FK also has a humidity/temperature sensor. This enables intelligent automatic operation, which is optimally oriented to the ventilation requirement according to the moisture loads that occur.

The sensor used measures the relative humidity of the air sucked in with an accuracy of $\pm 2\%$ and the temperature with an accuracy of $\pm 0.2^\circ\text{C}$. The sensor is used to measure the relative humidity of the air sucked in with an accuracy of $\pm 2\%$.

Intelligent humidity control

The intelligent humidity control activated in the standard system calculates back to the relative humidity at 22°C (standard condition) on the basis of the measured values of relative humidity and temperature, practically a control according to absolute humidity. The determined value is then used to control the volume flow between 50 % and 70 % relative humidity at 22°C , as shown in the following diagram:



The switched stages depend on the setting of the DIP switches 1,2 (basic ventilation) and 6,7 (demand ventilation). At 50 % RH (22°C), the fan automatically switches to the basic ventilation level. The volume flow rate is increased linearly to the course of the r.h. until it reaches the demand ventilation level at 70 % r.h. (22°C).

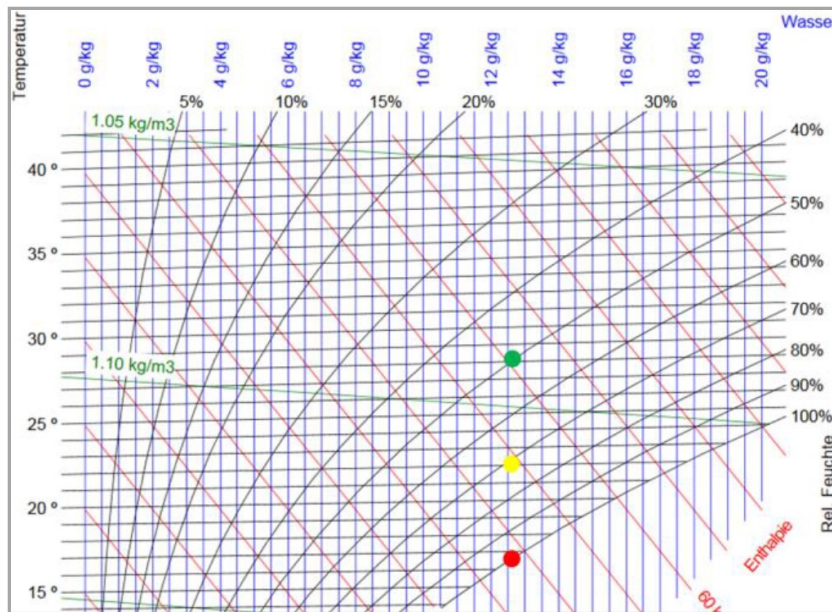
The Silvento ec with the Comfort Board 5/FK continuously calculates a moving mean value of the relative humidity at 22°C so that the fan does not run continuously through a high ventilation level during the summer months, during which time the outdoor air humidity is regularly to permanently 60 %-70 %, and thereby draws moisture into the home. This mean value represents the basic level of air humidity (background humidity) below which the fan cannot fall even with increased ventilation capacity.

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The intelligent humidity control described above is only activated when the humidity rises by 6 % above the background humidity. This is deactivated again if the value background humidity + 2 % is reached or the humidity cannot be reduced over a period of two hours.

Why calculate back to 22°C?

For physical reasons, warm air can absorb more water than cold air. As a result, the measured relative humidity at e.g. 28°C is significantly lower than at 22°C, even if both conditions have the same absolute humidity, i.e. the same amount of water in the air. This circumstance can still be clarified with the following h,x-diagram:



The diagram shows three air states that can occur at the same time in an apartment. The water content in the air is always approx. 12.5 g/kg, as the air flows through the entire usage unit.

A bathroom that has been properly heated and in which the fan incl. sensor is suspended could be marked green. At a temperature of 28°C, a relative humidity of just under 50% is measured. The fan remains off or is at most at the basic ventilation level. The cooler bedroom (yellow, 22°C) already has a relative humidity of just over 70 %, i.e. a value that already has the highest ventilation requirement.

The situation then looks quite bad in the unheated cellar (red, <17°C). Here already the dew point is reached and first drops form on the wall.

The implemented intelligence reliably detects increased ventilation requirements in the entire usage unit, regardless of temperature, and can consistently ensure a healthy climate for users and building fabric.

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