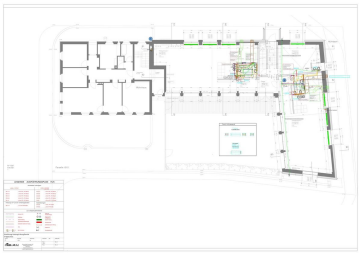


Kindergarten and apartments - Chur, Switzerland

Author: Cristina Polo (SUPSI)

Decentral ventilation with "monoblocks"

HVAC

What is the solution?

Decentralized ventilation monoblocks were installed in the kindergartens and decentralized comfort ventilation systems with heat recovery were implemented in the new apartments. This enable operation with a high heat recovery factor that is adapted to the occupancy of the individual rooms. In summer, the devices of the kindergarten can also be used for night cooling. The ventilation decentral devices are installed in the bathrooms. In the apartments the ducts and vents are integrated in the roof. In the kindergarten the vents are in the walls of the bathrooms while the ducts are masked with a lowered ceiling.

Why does the solution work?

The impact on the building has been reduced to a minimum with the choice of using decentralized appliances that do not require invasive conduct. Small units were implemented to best achieve the thermal comfort regulation of the indoor spaces. Decentralized units allow air quality and a constant adjustment of the volume flow by the reduction of the average air volume and minimization of power consumption or by contrary with an automatic increase in air volume in the event of high pollutant emissions (es. a greater influx of people). Furthermore, especially in winter, the cold outside air contains very little moisture; the continuous exchange of air also ensures that excess moisture is removed. However, if significantly more air is exchanged than necessary, the air can become too dry and this monoblock units offers 2 possibilities to prevent this: the demand-oriented regulation of the amount of air by means of a CO2 sensor or humidity recovery by means of an enthalpy exchanger.

Description of the context:

The complex is divided into two structures. The residential building is characterized by the building height and the facade design as the main volume of the ensemble. The previous commercial building is deeper and, due to its L-shaped geometry, forms an inner courtyard which, with its round arches and the widely projecting roof, has a high spatial quality. The specifications of the city of Chur as client were clear. The artistically valuable ensemble was to be preserved in its original expression. The earlier interventions should be dismantled, the change of use of the annex should be visible from the outside as a renewal, but should be connected with the original design. And in addition: "Since Chur has been an energy town since 2011, it was necessary to incorporate the latest findings in energy and building physics into the renovation."

Pros and cons of the solution:

With the choice of using decentralized appliances that do not require invasive conduct, the impact on the building has been reduced to a minimum. The operation with a high heat recovery factor that is adapted to the occupancy of the individual rooms. In summer, the devices of the kindergarten can also be used for night cooling. Comfort ventilation not only ensures high air quality, but also the right level of room air humidity. This is based on the unacceptability of window ventilation in very cold weather and the associated low level of acceptance. Comfort mechanical ventilation systems avoid noise of the street and are therefore also playing an increasingly important role in the energy efficiency of the building and help to save heating costs. Fulfil for air hygiene and a good working or living spaces. Autonomous units of relatively low productivity but decentralized systems are more economical in operation. Each unit serves an individual area, which makes possible different temperature settings and different time schedules by zones.

Additional information about the solution:

Drexel & Weiss raumklima web page: https://www.drexel-weiss.at/produkte-und-loesungen/zubehoer/perfektes-raumklima/ This building was awarded with the Swiss Solar Prize in 2016. Link to Swiss solar prize data: https://www.solaragentur.ch/sites/default/files /g-16-09-22_dwhg_und_doppelkindergarten_chur_def.pdf Link to energy-cluster.ch data: https://www.energie-cluster.ch/de/deklariert-ch/plusenergiegebaeude/schule-doppelkindergarten-chur-sanierung-(solarpreis-2016)-calandastrasse-50-7000-chur-9-3583.html

Are there any related publications or pictures of the solution?

Ventilation Kindergarten

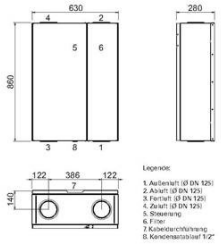
drexel und weiss
raumklima : intelligent und einfach

aerosilent business
aeroschool
Einbau

Ventilation apartments

drexel und weiss
raumklima : intelligent und einfach

Technische Daten	*aerosilent bianco*
Stromversorgung	230 VAC / 50 Hz / 13 A
Nennluftmenge	95 m³/h
Maximale Luftmenge	165 m³/h 100 Pa ext.
Abmessungen BxTxH mm	630/280/860
Gewicht	45 kg
Maximale Leistungsaufnahme der Ventilatoren (total)	75 W
Stromeffizienz nach PHI	0,29 Wh/m³
Zuluftseitiger Wärmebereitstellungsgrad	90%
Fortluftseitiger Wärmebereitstellungsgra, effektiv (nach PHI)	87%
Maximale Leistungsaufnahme der elektr. Vorerwärmung	1000 W
Akkustische Daten bei Nennluftmenge und 100 Pa extern:	
Schallleistungspegel Zuluft (Mündungsreflexion berücksichtigt)	50 dB (A)
Schallleistungspegel Abluf (Mündungsreflexion berücksichtigt)	57 dB (A)
Schalldruckpegel Gehäuse (Mündungsreflexion berücksichtigt)	44 dB (A)



Legende:
1. Außenluft (Ø DN 125)
2. Abluft (Ø DN 125)
3. Fortluft (Ø DN 125)
4. Zuluft (Ø DN 125)
5. Steuerung
6. Filter
7. Kabeldurchführung
8. Kondensatablauf 1/2"

aerosilent bianco L
(Stutzen oben/unten)

Bestellinformation

aerosilent bianco R	150.0520
aerosilent bianco L	150.0540

Ventilation Plan first floor © HT-Plan