PICHLER SCHOOL VENTILATION

THE RIGHT SOLUTION FOR EVERY EDUCATIONAL ESTABLISHMENT









Our PICHLER school ventilation systems ensure an excellent indoor climate that promotes the health and performance of both students and teachers.

FIRST-CLASS AIR QUALITY

PICHLER SCHOOL VENTILATION SYSTEMS FOR AN EXCELLENT LEARNING COMFORT, A HEALTHY ROOM CLIMATE AND MAXIMUM ENERGY EFFICIENCY

PRODUCTIVITY AND LEARNING COMFORT

The air quality in classrooms is of particular importance: if the air is fresh and clean, this has a positive effect on the ability to concentrate and on the productivity and well-being of pupils and teachers. A key indicator for good air is its $\rm CO_2$ content, the limit value of which is to be 1000 ppm. How can you manage to stay below this limit value in classrooms?

You can either open the windows every 20 to 30 minutes and ventilate the room intensively, or, to have it simple, you ventilate the room fully automatically – by using our PICHLER school ventilation systems.

A HEALTHY INDOOR CLIMATE

Our mechanical school ventilation systems permanently replace the used indoor air with pure and pre-heated fresh air. In addition to excess CO₂, germs, humidity as well as odorous substances and pollutants are discharged from the rooms together with the extract air. For one thing, this prevents direct health issues like for example headaches, and secondly, these systems make a substantial contribution to provide infection protection by effectively reducing the concentration of virus-carrying aerosols, bacteria, spores, etc. in the air. The room climate is healthy and comfortable, the air quality is superb.

MAXIMUM ENERGY EFFICIENCY

Our PICHLER complete systems offer you maximum energy efficiency. We use highly efficient components and parts that are carefully matched and that guarantee the economic operation of your system. Furthermore, heat recovery itself already allows you to save a considerable amount of energy and heating costs. Energy consumption drops, and sustainability increases. This is also beneficial to the environment.









We have the perfect ventilation technology solution for every application and every building size: from small-scaled nursery schools to university campuses, including multi-storey school buildings.

SYSTEM DIVERSITY

THE RIGHT SOLUTION FOR EVERY EDUCATIONAL ESTABLISHMENT

INDIVIDUAL SOLUTIONS

As a specialised provider for comfort ventilations, we provide the individually tailored system solution for every educational establishment. Whether we are dealing with nursery schools and day-care centres, primary schools, secondary schools, secondary academic schools, universities of applied sciences, universities, seminar centres or any other type of educational establishment, our ventilation specialists will provide you with comprehensive advice and assistance in finding your ideal solution.

FROM CLASSROOMS TO LABORATORIES

The scope of application is wide: classrooms or assembly rooms, corridors, ballrooms, lecture halls, gyms, changing rooms, showers, toilets, kitchens, laboratories, workshops, etc. can be efficiently ventilated with our ventilation systems. When it comes to planning and dimensioning, decisive factors are for instance the way in which the rooms are to be used, the architecture of the building, the number of pupils, teachers and employees and for how long they will be staying in the room, standards and guidelines as well as the individual goals you wish to achieve.

FOR NEW-BUILDS AND RENOVATIONS

Our complete systems are used for both new buildings and renovation projects. All PICHLER comfort ventilation units used in nursery schools, schools and comparable buildings are highly efficient and extra quiet; from the decentralised LG 740 to the centralised LG 10000. They work fully automatically, are user-friendly and can be monitored via remote access on request.











MORE DETAILS AND
FURTHER REFERENCE
PROJECTS CAN BE FOUND AT
WWW.PICHLERLUFT.AT

Nursery school / Velden, Austria / comprehensive renovation / centralised PICHLER school ventilation system with heat recovery and CO₂-controlled indoor climate adjustment

Primary school Neu-Arzl / Innsbruck, Austria / newbuild / roof-integrated PICHLER school ventilation system with heat recovery

Lakeside Science & Technology Park / Building 11 / Klagenfurt am Wörthersee, Austria / new-build / 8,000 m² total area / PICHLER complete system

EXEMPLARY

PICHLER SCHOOL VENTILATION: FIRST-CLASS AIR QUALITY FROM THE NURSERY SCHOOL TO THE TECHNOLOGY PARK

NURSERY SCHOOL IN VELDEN AM WÖRTHERSEE

The children and teachers in the nursery school of Velden am Wörthersee can take a deep breath and relax. The building has undergone complete thermal refurbishment and has been equipped with a centralised PICHLER school ventilation system with heat recovery. This has led to a significant reduction of energy and heating costs, making the nursery school a passive house standard-compliant building. Controlled ventilation provides for first-class indoor air quality. One distinctive feature of the ventilation system: the CO₂-controlled indoor climate adjustment functionality (by means of CO₂ sensors), via which every group room can be controlled individually.

PRIMARY SCHOOL NEU-ARZL IN INNSBRUCK

The children and teachers from the Innsbruck primary school Neu-Arzl now also enjoy a healthy indoor climate with constant top air quality. The sustainable new-build was equipped with an energy-efficient PICHLER school ventilation system and put into operation in 2018. The centrepiece of the ventilation system is the roof-integrated centralised ventilation unit with heat recovery, inflow plates and an insulated base frame. The unit base is designed as a steel structure with insulated panels (U value: 0.3 W/m²K).

LAKESIDE SCIENCE & TECHNOLOGY PARK KLAGENFURT

The Klagenfurt Lakeside Science & Technology Park is flourishing, thriving and prospering. Together with the Alpen-Adria University, the Park has established itself as a highly specialised facility for ICT research and development. Expectations are that around 2 500 people will be researching, developing, working, teaching and living here by 2030. "Building 11" with a total usable space of 8,000 m² has been equipped with a PICHLER complete system. Also part of the comprehensive package: ventilation units, weather protection grilles, fresh air shafts, jet nozzles, floor convectors and lots more.



PROPER DIMENSIONING

A PREREQUISITE FOR FRESH AIR AND SUCCESSFUL LEARNING!

STUFFY AIR IN THE CLASSROOM

Pupils and teachers spend a large part of their day in classrooms. Therefore, a good indoor air quality is vitally important. In particular the CO_2 concentration in the indoor air plays a major role in this respect. It depends on some crucial factors such as the spatial volume, the number of persons and how long they are staying in the room as well as the degree of their activity.

REQUIRED FRESH AIR SUPPLY

Dimensioning the ventilation system and air change rates is subject to a number of national requirements and regulations that are decisive for planning.

PERSON-RELATED OUTDOOR AIR VOLUME FLOWS FOR EDUCATIONAL ESTABLISHMENTS IN COMPLIANCE WITH ÖNORM H 6039:2023

	Required outdoor air volume flows m³/h per user in educational establishments			
Categories by educational levels (persons' age)	Medium CO ₂ concentration of 1000 ppm in the indoor air Values for operating areas focussing on teaching / learning / work (e.g. classrooms, nursery school group rooms, lecture halls, open study areas, multi-purpose rooms, libraries, workspaces for teachers)	Medium CO₂ concentration of 1400 ppm in the indoor air Values for operating areas focussing on leisure / recreation (e.g. dining area, auditorium, home bases, socia areas for teachers) and entrance areas		
Elementary level and primary level (usually 0- to 10-year-olds)	28	17		
Secondary level I and II (usually 11- to 18-year-olds)	33	20		
Tertiary sector, adult education, teachers, counsellors (usually over 19-year-olds)	36	21		

Source: Complementary document to the $\ddot{\text{O}}$ ISS guidelines for the education sector, as of 01/2023

DIMENSIONING EXAMPLES*

For a primary level classroom with a classroom occupation of 25 children up to 10 years and one teacher present, at a medium $\rm CO_2$ concentration of 1000 ppm in the indoor air, this leads to a required fresh air supply of 736 m³/h

 $(25 \text{ children } \times 28 \text{ m}^3/\text{h} + 36 \text{ m}^3/\text{h} = 736 \text{ m}^3/\text{h}).$

For a secondary level classroom with a maximum occupation of 25 pupils between 11 and 18 years and one teacher, at a medium CO_2 concentration of 1000 ppm in the indoor air, this leads to a required fresh air supply of 861 m³/h (25 children x 33 m³/h + 36 m³/h = 861 m³/h).

 $^{^{*}}$ Following the supplementary document to the ÖISS guidelines for the education sector, as of 01/2023



DECENTRALISED OR CENTRALISED

DEPENDING ON THE TASK TO BE PERFORMED, THE RIGHT VENTILATION SOLUTION, DEMAND-BASED.

THE MOST COMMON VENTILATION CONCEPTS FOR SCHOOLS

Depending on the starting situation, whether we are dealing with a new construction or renovation project, PICHLER offers the ideal system solution for any requirement. The overall objective is to achieve a consistently high air quality level in all classrooms – a prerequisite for successful learning!

Our product range offers centralised and decentralised systems, with the possibility of adjusting all classrooms individually. The result is a healthy and comfortable room climate without a draft under hygienically perfect conditions.





DECENTRALISED SOLUTIONS IN CLASSROOMS

COMPACT VENTILATION UNITS FOR PERFECT INDOOR AIR QUALITY.

Decentralised ventilation units are installed directly in the classrooms and offer an easily retrofittable solution, in particular with regard to future renovation. They supply fresh air to the indoor space in a customised fashion, leading the outdoor air and exhaust air ducts through an external wall.

BENEFITS

- An individual ventilation unit for each classroom
- Easily to assemble provide for easy retrofitting and renovation in existing school buildings
- Excellent acoustic properties

- Demand-based operation via integrated CO_2 measurement
- Enthalpy exchanger for efficient heat and moisture recovery
- No condensate draining required
- Connection to the building control system (ModBus, KNX) and connection to the Pichler cloud solution for service and maintenance purposes
- Supply lines and fire protection components can be dispensed with
- Compliant with hygiene requirements in accordance with VDI 6022

QUICK SELECTION

			Class types		
Unit type	Installation	Air volume	Smaller & medium-sized classrooms	Large classrooms	
Floor unit LG 740	Indoors	max. 750 m ³ /h	1	-	
Floor unit LG 1000 SKS	Indoors	max. 1000 m³/h	_	1	
Ceiling unit LG 1000 SKDE	Indoors	max. 1000 m³/h	_	1	

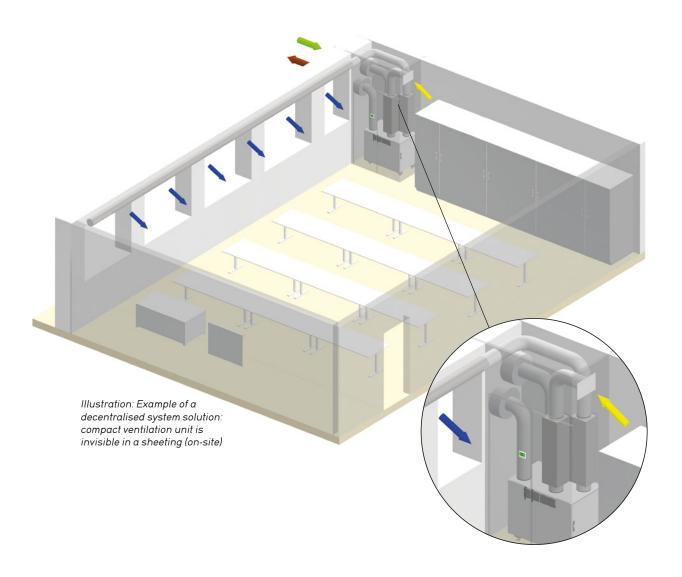


DECENTRALISED CABINET-INTEGRATED SOLUTION

Ideal for smaller and medium-sized classrooms. The compact ventilation unit is installed in a lockable cabinet. The silencers integrated into the system allow for ultra-silent operation even at higher volume flows. The control element indicates the current $\rm CO_2$ content in the classroom. The supply air is introduced in a draught-free

fashion by optionally using a uno-duct system or a textile system.

Maximum air volume flow: 750 m³/h Sound emission of the system solution (with $V_{\rm ref}$): $L_{\rm PA}$ approx. 30 dB(A)





FLOOR UNIT LG 740



TECHNICAL SPECIFICATIONS

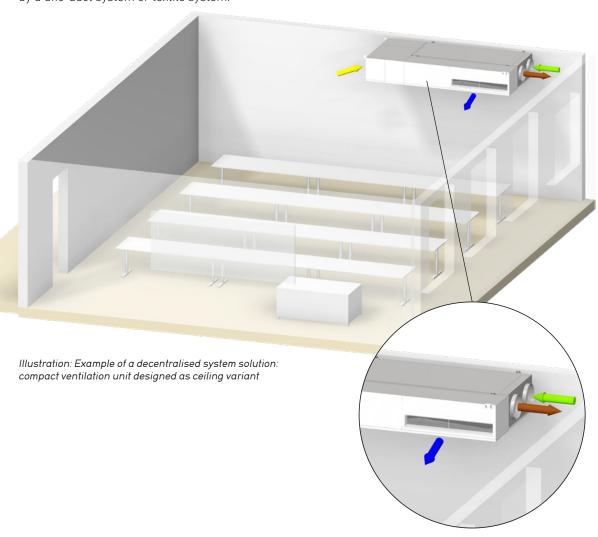
Unit type	Floor unit LG 740	
Heat exchanger	Enthalpy	
Pre-heating coil	Electric	
Volume flow V _{max.}	750 m³/h	
Nominal operating point V _{ref}	525 m³/h	
External compression at V _{max.}	150 Pa	
Specific input power SIP	0.20 Wh/m³	
Thermal efficiency	80.5%	
Moisture transfer rate	72.5%	
Standard filter class, outdoor air	ePM1 55%	
Standard filter class, extract air	ISO Coarse 70%	
Control	Volume flow constant, demand-controlled	
Control unit	Touch control unit with CO₂ indication	
Air duct connections	4 x Ø 200 mm	
Electrical connection	230 V / L/N/PE / 50 Hz / 16 A	
Condensate drainage	Not required	
Unit dimensions (W x H x D)	1090 x 940 x 660 mm	
Unit weight	120 kg	



DECENTRALISED CEILING SOLUTION

Ideal for classrooms and conference rooms. The compact ventilation unit is mounted on the ceiling in a space-saving manner. The silencers integrated into the system can be mounted to the unit easily and quickly. The on-site system housing with drywall boards can be attached directly on the ceiling unit at the fastening points provided. The unit can be accessed from beneath for inspection purposes. The control element indicates the current $\rm CO_2$ content in the classroom. The supply air is introduced in a draught-free fashion optionally using the two supply air grids or, upon request, by a uno-duct system or textile system.

Maximum air volume flow: 1000 m³/h Sound emission of the system solution without SA module (with V_{ref}): $L_{PA} < 35$ dB(A) Sound emission of the system solution with SA module (with V_{ref}): $L_{PA} < 30$ dB(A)

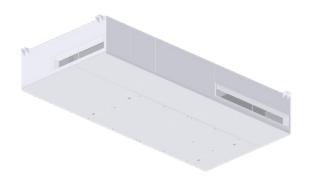




CEILING UNIT LG 1000 SKDE

CEILING UNIT LG 1000 SKDE WITH SA MODULE





TECHNICAL SPECIFICATIONS

Unit type	Ceiling unit LG 1000 SKDE		
Heat exchanger	Enthalpy		
Pre-heating coil	Electric		
Volume flow V _{max.}	1000 m³/h		
Nominal operating point V _{ref}	700 m³/h		
External compression at $V_{\rm max.}$	100 Pa		
Specific input power SIP	0.32 Wh/m³		
Thermal efficiency	75.9%		
Moisture transfer rate	64.7%		
Standard filter class, outdoor air	ePM1 55%		
Standard filter class, extract air	ePM10 75%		
Control	Volume flow constant, demand-controlled		
Control unit	Touch control unit with CO₂ indication		
Air duct connections	Outdoor air / exhaust air 2 x Ø 315 mm, sleeve size		
Electrical connection	230 V / L/N/PE / 50 Hz / 16 A		
Condensate drainage	Not required		
Unit dimensions with SA module (W x H x L)	1490 x 490 x 3055 mm		
Unit dimensions without SA module (W x H x L)	1005 x 490 x 2195 mm		
Unit weight with SA module 350 kg			
Unit weight without SA module	220 kg		



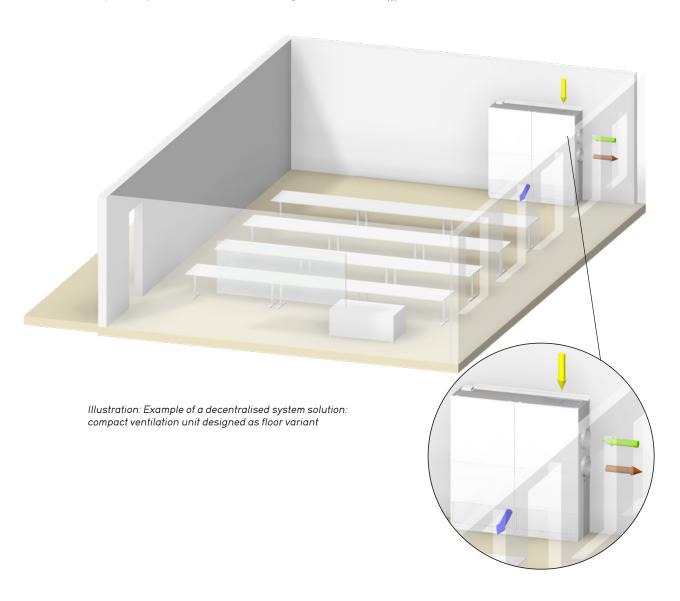
DECENTRALISED SOLUTION FLOOR UNIT

Ideal for classrooms and conference rooms. The compact floor unit is placed at the rear wall of the room in a space-saving manner. The innovative displacement concept allows for draught-free and homogeneous introduction of supply air to the room. At low outdoor temperatures the integrated and continuously controlled re-heater battery provides for convenient supply air conditions. In addition, the integrated silencers ensure almost silent operation. The unit is connected to the outdoor air and exhaust air ducts at the side, depending on the unit design on the left-hand or right-hand side, respectively. The extract air is discharged via the

unit top, the integrated CO_2 sensor allowing for demand-based ventilation. The control element indicates the current CO_2 content of the extract air.

The plain design front can be used as a magnetic board and can be integrated into the classroom so that it perfectly blends in with the environment without attracting attention.

Maximum air volume flow: 1000 m³/h Sound emission of the system solution (with V_{ref}): $L_{PA} < 30 \ dB(A)$





FLOOR UNIT LG 1000 SKS



TECHNICAL SPECIFICATIONS

Unit type	Floor unit LG 1000 SKS
Heat exchanger	Enthalpy
Pre-heating coil (output)	Electric (1900 W)
Re-heater battery (output)	Electric (1900 W)
Volume flow ${\rm V}_{\rm max.}$	1000 m³/h
Nominal operating point V_{ref}	700 m³/h
External compression at $V_{\rm max.}$	100 Pa
Specific input power SIP	0.32 Wh/m³
Thermal efficiency	81.1%
Moisture transfer rate	74.4%
Standard filter class, outdoor air	ePM1 55%
Standard filter class, extract air	ePM10 75%
Control	Volume flow constant, demand-controlled
Control unit	Touch control unit with CO ₂ indication
Air duct connections	Outdoor air / exhaust air 2 x Ø 315 mm, sleeve size
Electrical connection	230 V / L/N/PE / 50 Hz / 16 A
Condensate drainage	Not required
Unit dimensions including SA module (W x H x D)	2015 x 2070 x 515 mm
Unit weight with SA module	390 kg





CENTRALISED SOLUTION VARIANTS

DRAUGHT-FREE, EFFICIENTLY TEMPERED AND FILTERED FRESH AIR WITH ONLY ONE CENTRAL VENTILATION UNIT.

A centrally installed ventilation unit uses an air duct system for the air exchange (supply air and extract air) and in this way supplies several classrooms with fresh air by demand-driven control. Central units can be either installed in engineering rooms or outdoors.

The choice of unit type depends on the number of classrooms to be supplied and the school level.

BENEFITS

- Unit version in compact or modular design depending on the space requirement
- Excellent acoustic properties

- Demand-based operation via CO₂ controlled volume flow controllers
- Optionally standard counterflow enthalpy exchanger for efficient heat and moisture recovery (no condensate draining required)
- Connection to the building control system (ModBus, KNX) and remote maintenance for service and maintenance purposes
- Easy, central maintenance
- Compliant with hygiene requirements in accordance with VDI 6022

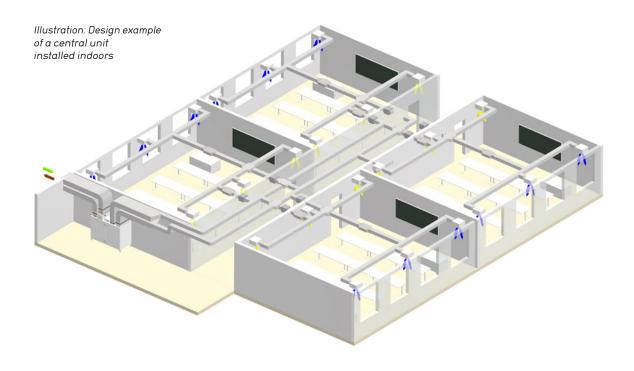
QUICK SELECTION

Unit type		A	Number of classrooms		
	Installation	Air volume	Primary level *	Secondary level **	
Compact unit LG 1400	Indoors	400 – 1200 m³/h	2	1	
Compact unit LG 3200	Indoors	900 – 3200 m³/h	3 – 5	2 – 3	
Modular unit LG 2500	Indoors / outdoors	900 – 2300 m³/h	3 – 5	2 – 3	
Modular unit LG 4000	Indoors / outdoors	1500 – 4400 m³/h	6 – 9	4 – 5	
Modular unit LG 6000	Outdoors	1800 – 6500 m³/h	9 – 13	6 – 8	
Modular unit LG 10000	Outdoors	2500 – 10000 m³/h	> 13	> 8	

^{*)} Reference value at maximum occupation: 25 pupils + 1 teacher



^{**)} Reference value at maximum occupation: 30 pupils + 1 teacher



TECHNICAL SPECIFICATIONS

Unit type	Compact unit LG 1400		Compact unit LG 3200	
Version	Indoors	Indoors	Indoors	Indoors
Heat exchanger	Standard	Enthalpy	Standard	Enthalpy
Volume flow V _{max.}	1200 m³/h	1200 m³/h	3200 m³/h	2900 m³/h
Nominal operating point V _{ref}	800 m ³ /h	800 m³/h	1700 m³/h	1700 m³/h
External compression at V _{max.}	200 Pa	200 Pa	200 Pa	200 Pa
Specific fan power SFP	0.36	0.38	0.33	0.34
Thermal efficiency	~ 85%	~ 78%	~ 85%	~ 80%
Moisture transfer rate	-	~ 72%	-	~ 76%
Standard filter class, supply air	ISO ePM1 55%	ISO ePM1 55%	ISO ePM1 55%	ISO ePM1 55%
Standard filter class, extract air	ISO Coarse 90%	ISO Coarse 90%	ISO Coarse 90%	ISO Coarse 90%
Control	Constant pressure or volume flow			
Air duct connection (W x H)	200 x 596 mm	200 x 596 mm	300 x 800 mm	300 x 800 mm
Dimensions for indoor installation (W x H x L)	775 x 1265 x 1445 mm	775 x 1265 x 1445 mm	1000 x 1655 x 2040 mm	1000 x 1655 x 2040 mm
Dimensions for outdoor installation (W x H x L)	-	-	-	-
Weight for indoor installation	~ 190 kg	~ 190 kg	~ 390 kg	~ 390 kg
Weight for outdoor installation	-	-	-	-

On request, with electric pre-heating coil and/or electric re-heater battery.



Unit type	Modular u	Modular unit LG 2500		Modular unit LG 4000	
Version	Indoors/outdoors	Indoors/outdoors	Indoors/outdoors	Indoors/outdoors	
Heat exchanger	Standard	Enthalpy	Standard	Enthalpy	
Volume flow $V_{\rm max.}$	2300 m³/h	2300 m³/h	4500 m³/h	4400 m³/h	
Nominal operating point V _{ref}	1700 m³/h	1700 m³/h	2600 m³/h	2600 m³/h	
External compression at $V_{\text{max.}}$	200 Pa	200 Pa	200 Pa	200 Pa	
Specific fan power SFP	0.33	0.34	0.3	0.31	
Thermal efficiency	~ 85%	~ 80%	~ 85%	~ 79%	
Moisture transfer rate	-	~ 76%	-	~ 74%	
Standard filter class, supply air	ePM1 55%	ePM1 55%	ePM1 55%	ePM1 55%	
Standard filter class, extract air	ISO ePM10 75%	ISO ePM10 75%	ISO ePM10 75%	ISO ePM10 75%	
Control	Constant pressure or volume flow				
Air duct connection (W x H)	730 x 650 mm				
Dimensions for indoor installation (W x H x L)	950 x 1680 x 2900 mm	950 x 1680 x 2900 mm	1500 x 1498 x 2820 mm	1500 x 1498 x 2820 mm	
Dimensions for outdoor installation (W x H x L)	1050 x 1890 x 2900 mm	1050 x 1890 x 2900 mm	1600 x 1708 x 2820 mm	1600 x 1708 x 2820 mm	
Weight for indoor installation	~ 700 kg	~ 700 kg	~ 850 kg	~ 850 kg	
Weight for outdoor installation	~ 800 kg	~ 800 kg	~ 1050 kg	~ 1050 kg	

On request, with electric pre-heating coil and/or combined exchanger for heating/cooling.

Unit type	Modular unit LG 6000		Modular unit LG 10000	
Version	Outdoors	Outdoors	Outdoors	Outdoors
Heat exchanger	Standard	Enthalpy	Standard	Enthalpy
Volume flow V _{max.}	6500 m³/h	-	On request	-
Nominal operating point V _{ref}	6400 m³/h	-	On request	-
External compression at V _{max.}	200 Pa	-	On request	-
Specific fan power SFP	0.31	-	On request	-
Thermal efficiency	85%	-	On request	-
Moisture transfer rate	-	-	On request	-
Standard filter class, supply air	ePM1 55%	-	On request	-
Standard filter class, extract air	ISO ePM10 75%	-	On request	-
Control	Constant pressure or volume flow	-	On request	-
Air duct connection (W x H)	1780 x 851 mm	-	On request	-
Dimensions for indoor installation (W x H x L)	2000 x 2080 x 3400 mm	-	On request	-
Dimensions for outdoor installation (W x H x L)	2100 x 2290 x 3400 mm	-	On request	-
Weight for indoor installation	~ 1500 kg	-	On request	-
Weight for outdoor installation	~ 1800 kg	-	On request	-

On request, with electric pre-heating coil and/or combined exchanger for heating/cooling.













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