

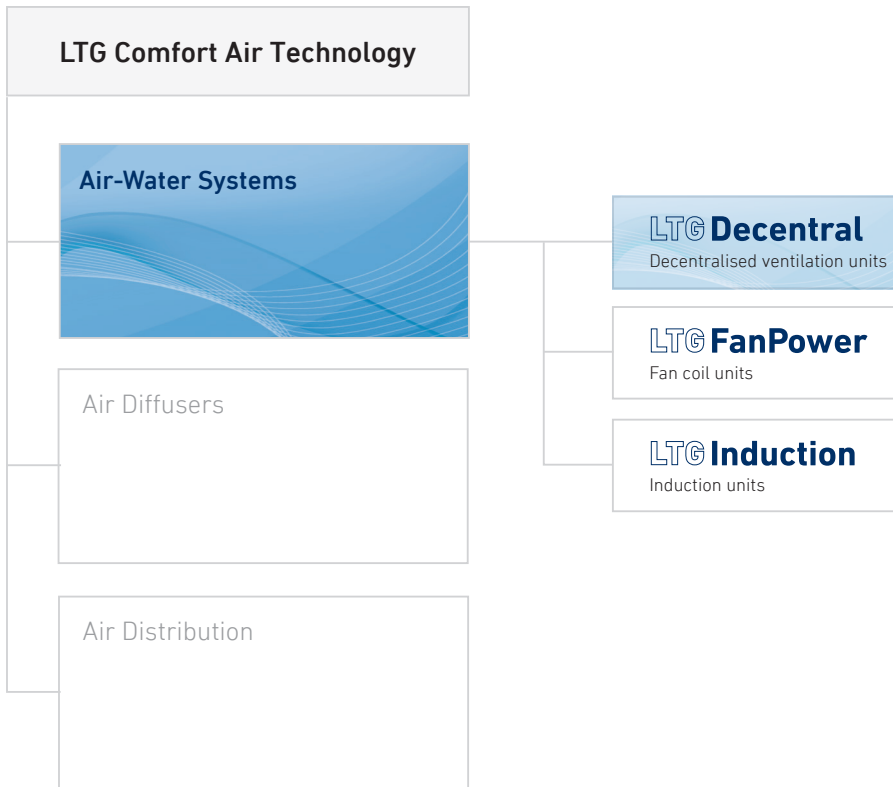


Comfort Air Technology
Decentralised ventilation units

Facade ventilation units with highly efficient heat recovery.
Flexible and energy-efficient without a central air conditioning system.

LTG Comfort Air Technology

LTG Comfort Air Technology at a glance



Traditionally always one step ahead

For almost 100 years, LTG Aktiengesellschaft has been a pioneer in air handling and air conditioning technology. Traditionally, LTG is always one step ahead with pioneering innovations. Inventions made us great and are still our strength. This is evidenced by our recent

awards. We are especially proud of winning the "Innovation Award" of the federal state of Baden-Württemberg 2017 for our worldwide unique comfort air concept for decentralised ventilation, the breathing ventilation system *PulseVentilation*.



INNOVATION BW
2017
Innovation Award Baden-Württemberg
Dr.-Rudolf-Eberle-Preis

Supported by:



Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag

Flexible and energy-efficient

Award-winning and frequently used around the world: the Decentralised ventilation units by LTG for new construction and refurbishment of non-residential buildings and schools. Decentralised ventilation units can be used to implement individual, demand-oriented air conditioning solutions at lower overall costs than traditional concepts. They also are a flexible and cost-efficient alternative for a central air conditioning unit with elaborate duct system and numerous fire dampers.



Decentralised facade ventilation units for “breathing” buildings

The system solution *PulseVentilation*, which was awarded the Innovation Award of the federal state of Baden-Württemberg in 2017, can implement your individual and demand-oriented air conditioning needs via a single facade opening. The decentralised facade ventilation units are also highly economical regarding investment and operation.



Decentralised ventilation units for schools

The FVS *Eco₂School* product line permits decentralised ventilation of classrooms, meeting rooms or event locations. In addition to thermal comfort and mould-free interiors, the systems guarantee compliance with the German VDI 6040 specifications.



Decentralised control intelligence

With *Connected Intelligence* LTG is offering an inexpensive and flexible automation solution for your air-water systems. The new concept, based on decentralised building automation system (BAS), permits on-demand and room-matched ventilation and air conditioning independently of the building management system.

Installation options



Ceiling installation



Wall installation



Sill installation



Floor installation

Characteristics



Energy-efficiency



Cost-effectiveness



According to Ecodesign Directive/EnEV



According to ArbStättV



Heating



Cooling



Dehumidification



Filtering



Heat recovery



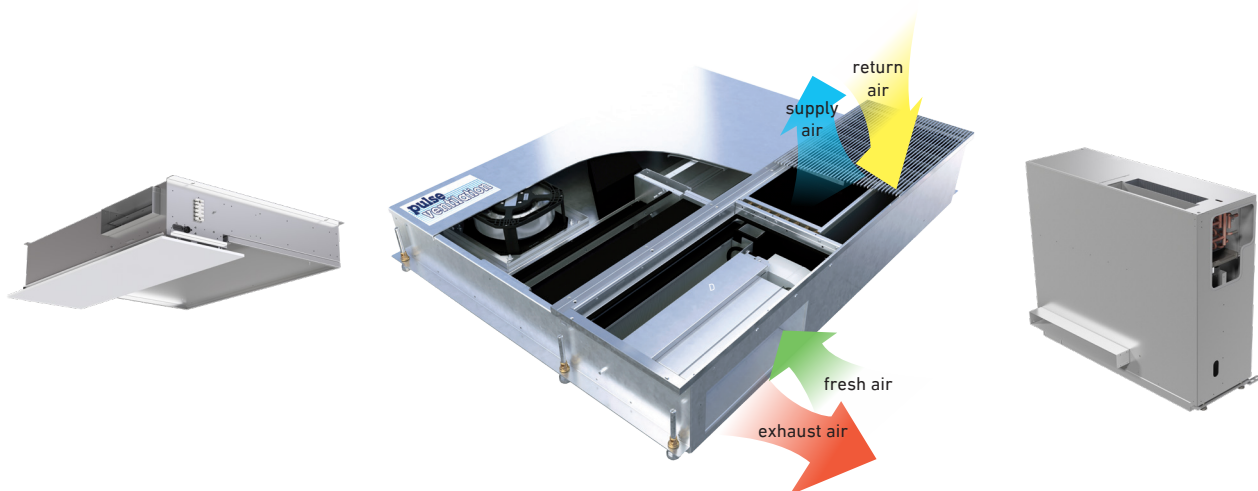
Connected Intelligence

The award winning system *PulseVentilation* for maximum efficiency and flexibility



All versions of the FVP family are able to imitate organic air movement thanks to the *PulseVentilation* system, in order to allow buildings to breathe “naturally” through a single facade opening. The very high heat and cold recovery that can be used around the year ensures an energy-efficiency that is unique in the industry. The transient flow with mixed displacement ventilation leads to a very high thermal comfort even at low supply air temperatures.

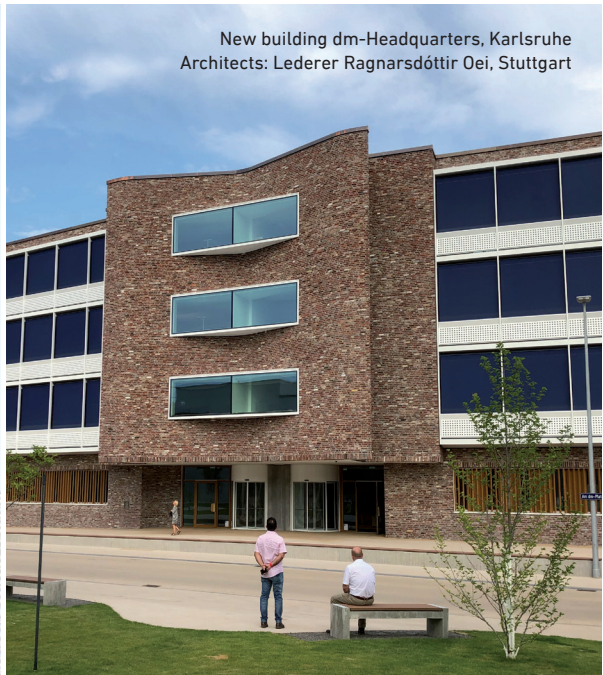
- Decentralised heating, cooling, dehumidification and filtering with instationary ventilation through only a single facade opening
- Unique economic efficiency through highly efficient heat recovery (heat recovery efficiency up to 90%) and demand-oriented control concepts
- Draft-free and low-noise pulse flow up to 130 m³/h (260 m³/h in hybrid ventilation mode) with optimal ventilation effectiveness
- Great effective area increase due to loss of central air conditioning unit, shafts, duct system and fire dampers
- Lowest power consumption by minimised pressure loss (appx. 20 W per unit), corresponding to 10% of the SFP specification of the german Energy Conservation Ordinance (EnEV)
- Year-round heat recovery reduces the investment costs for central heat supply



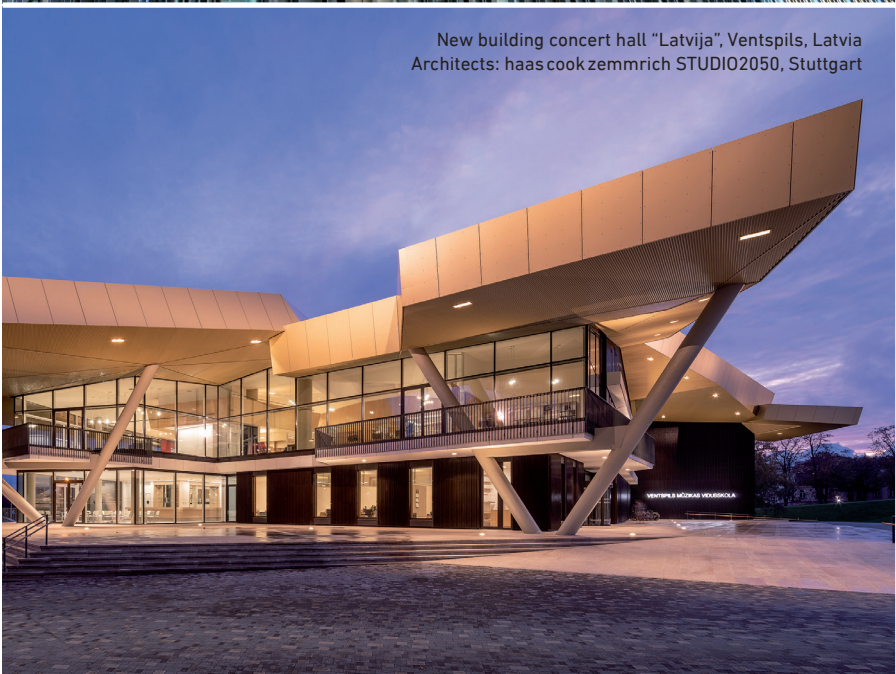
Visualisation of the “breathing in and breathing out” of the *PulseVentilation* System



Refurbishment office building, Rue Guersant, Paris
Architects: Lobjoy-Bouvier-Boisseau, Boulogne-Billancourt



New building dm-Headquarters, Karlsruhe
Architects: Lederer Ragnarsdóttir Oei, Stuttgart



New building concert hall "Latvija", Ventspils, Latvia
Architects: haas cook zemmrich STUDIO2050, Stuttgart



New building HeidelbergCement, Heidelberg
Architects: AS+P, Frankfurt



New building Viastore, Stuttgart
SCHWARZ + SCHWARZ Architects, Stuttgart

Decentralised systems for installation in ceiling, sill or floor



FVP-D for ceiling installation

The barely visible ceiling unit is particularly suitable for floor-deep glazing without a raised floor. It can be combined with various ceiling elements (e.g. lamps).



FVP-V for sill installation

The sill unit is ideal for inexpensive refurbishment with limited floor heights, because there is no need for raised and cavity floors or false ceilings.



FVP-B for floor installation

The floor unit with its small unit height is particularly suitable for installation in raised and cavity floors. It is ideal for refurbishment and new construction with floor-deep glazing.

Characteristics



Energy-Efficiency



Cost-effectiveness

Approved
Ecodesign/EnEV

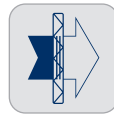
Heating



Cooling



Dehumidification



Filtering



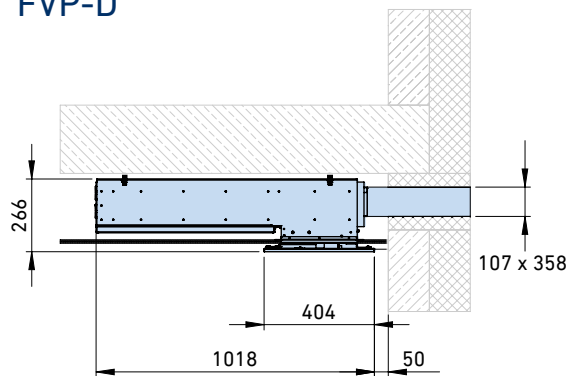
Heat Recovery



Connected Intelligence



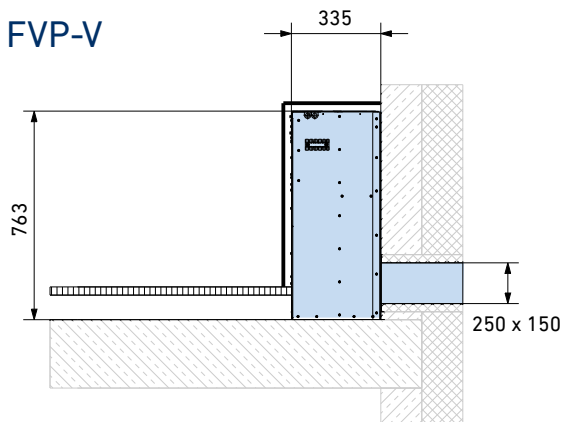
FVP-D



Length x width x height	1204 x 1018 x 266 mm	
Flow rate	up to 130 m ³ /h* / 260 m ³ /h**	
Condensing operation	■	
Max. cooling output ¹⁾	total: 830 W	room: 590 W
Max. heating output ²⁾	total: 2105 W	room: 745 W
Heat recovery efficiency ³⁾	> 80%	
Electrical performance input ⁴⁾	12...40 W	
Sound level L _{pA} ^{4) 5)}	21...37 dB(A)	



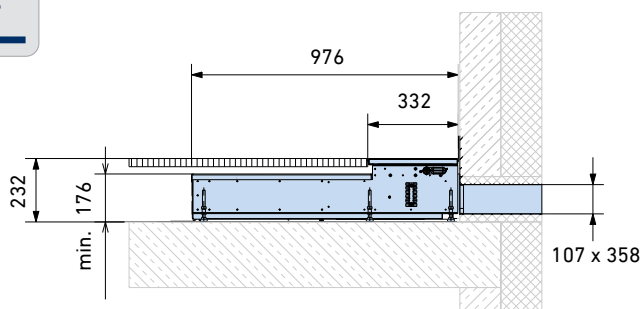
FVP-V



Length x width x height	1053 x 335 x 763 mm	
Flow rate	up to 130 m ³ /h* / 260 m ³ /h**	
Condensing operation	■	
Max. cooling output ¹⁾	total: 835 W	room: 595 W
Max. heating output ²⁾	total: 2125 W	room: 765 W
Heat recovery efficiency ³⁾	> 80%	
Electrical performance input ⁴⁾	12...40 W	
Sound level L _{pA} ^{4) 5)}	23...36 dB(A)	



FVP-B



Length x width x height	1150 x 976 x 232 mm	
Flow rate	up to 130 m ³ /h* / 260 m ³ /h**	
Condensing operation	■	
Max. cooling output ¹⁾	total: 860 W	room: 620 W
Max. heating output ²⁾	total: 1920 W	room: 560 W
Heat recovery efficiency ³⁾	> 80%	
Electrical performance ⁴⁾	8...25 W	
Sound level L _{pA} ^{4) 5)}	22...37 dB(A)	

■ Standard

* on average across the entire cycle

** in hybrid ventilation mode

1) 32 °C outside temperature, 6 °C inlet temperature (condensing), 200 kg/h water mass flow, 26 °C room temperature, 120 m³/h outside air flow rate

2) -12 °C outside temperature, 50 °C inlet temperature, 100 kg/h water mass flow, 22 °C room temperature, 120 m³/h outside air flow rate

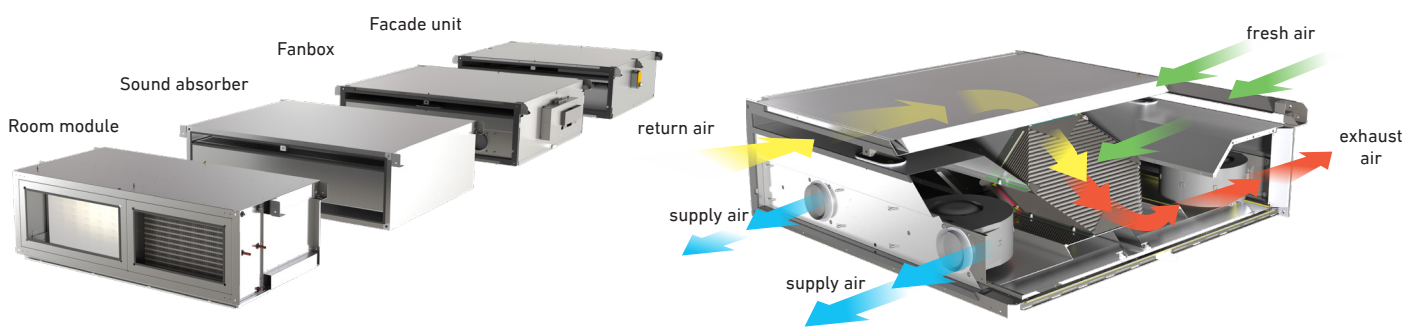
3) depending on the cycle time and air volume
4) by 60...120 m³/h outside air flow rate
5) by 8 dB room dampening

Controlled CO₂ level without external noise and fine dust/pollen: the FVS Eco₂School



Suitable for new construction and refurbishment, easy to integrate into the ceiling or on the wall. Air flow rates up to 990 m³/h for rooms with high occupation density.

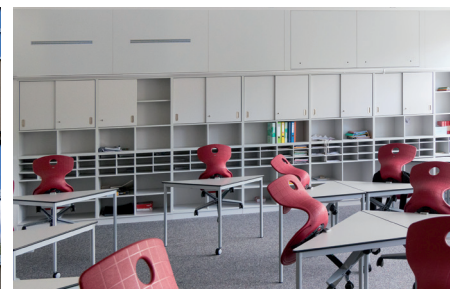
- Highest air quality: energy-efficient, draught-free and low-noise
- Guaranteed compliance with the german workplace ordinance (ArbStättV) and VDI 6040 incl. the required minimum external air change
- Clearly reduced risk of infection and less sick leave
- Protection of the building structure, prevention of mould formation
- Interference-free lessons and lowest fine dust/pollen content by effective filtering of the outside air
- Energy-saving through high-efficient heat recovery (> 80%)
- Individual regulation as required: via time or CO₂-/VOC-Sensor
- Plug-and-Play Solution: fast and easy retrofit incl. control system
- A single facade opening for fresh air and exhaust air
- Space-saving dimensions
- Different installation options available
- Type FVS-1000 for air flow rates up to 990 m³/h. For larger classrooms and seminar rooms, assembly and meeting rooms, laboratories and all non-residential buildings



Matthäus Hahn High School, Leinfelden, Germany



Music middle school Thuringia, Austria



Music middle school Thuringia, Austria

Characteristics



Energy-Efficiency



Cost-effectiveness



According to Ecodesign Directive/EnEV



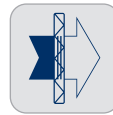
Heating



Cooling



Dehumidification



Filtering



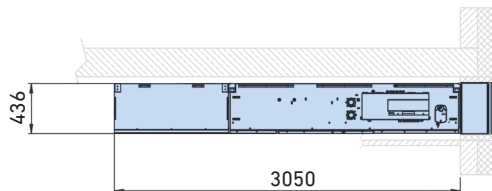
Heat Recovery



Connected Intelligence



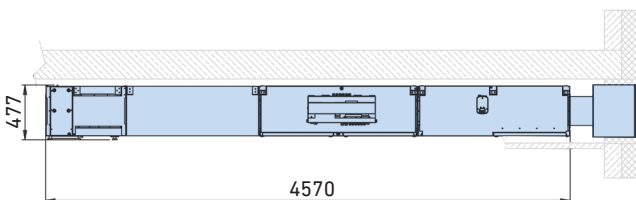
FVS-600 for ceiling/wall



Length x width x height ^{1) 2)}	3050 x 830 x 436 mm
Flow rate	up to 720 m ³ /h
Supply/Return air	■
Heat recovery	■
Night ventilation	■
Heat recovery efficiency	up to 83%
Electrical performance input ³⁾	50 W
Sound level L _{pA} ³⁾	27 dB(A)
SFP value	360 W/(m ³ /s)
Design/Options	Installation in ceiling panelling or exposed installation with integrated LDB linear diffusers
Accessories	Re-heater/cooler, connection to various bus systems, protective grating



FVS-1000 for ceiling



Length x width x height ^{1) 2)}	4570 x 1532 x 477 mm
Flow rate	up to 990 m ³ /h
Supply/Return air	■
Heat recovery	■
Night ventilation	■
Heat recovery efficiency	up to 86%
Electrical performance input ⁴⁾	270 W
Sound level L _{pA} ⁴⁾	35 dB(A)
SFP value	560 W/(m ³ /s)
Design/Options	Installation in ceiling panelling with integrated LDB linear diffusers
Accessories	Re-heater/cooler, connection to various bus systems, protective grating

■ Standard

1) device for on-site covering

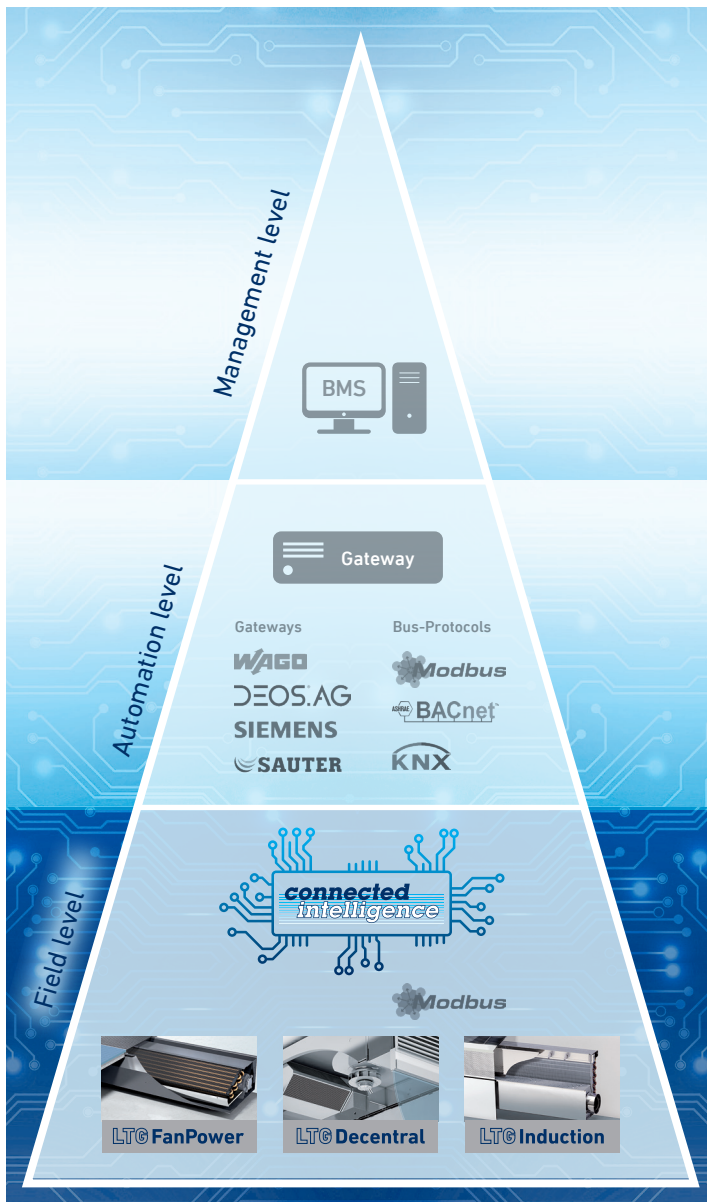
2) incl. sound absorber

3) by 6 dB room dampening and 400 m³/h outside air flow rate4) by 10 dB room dampening and 930 m³/h outside air flow rate

On-demand ventilation even without a central building management system: with decentralised control intelligence



Connected Intelligence offers an inexpensive and flexible automation solution for LTG air-water systems. The System permits on-demand and room-matched ventilation and air conditioning with or without a building management system (BMS). Inexpensive and easy to install, the units can be connected to form a network that is compatible with existing building automation solutions and open for many different sensor systems.



Innovative automation solution

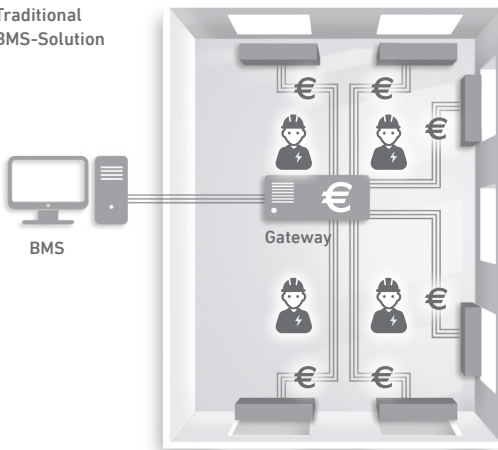
- Relocation of the control tasks for energy-efficient air conditioning on the local field level
- Simple implementation of energy-efficient demand-based ventilation and innovative ventilation concepts (tangential, night, hybrid ventilation)
- High flexibility from self-supporting stand-alone solutions (master/slave) or BMS connection, as well as simple scaling for expansion/re-equipment

Decentralised control intelligence

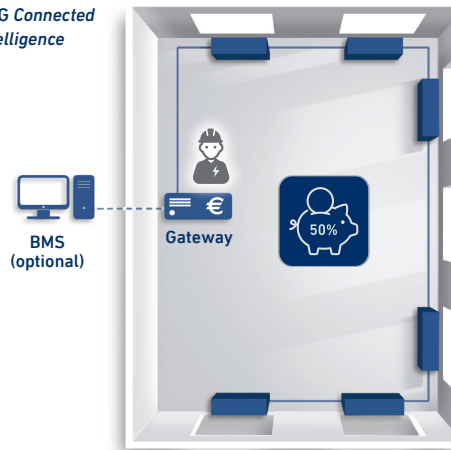


- Independent, demand-oriented and energy-efficient control of the units
- Manufacturer know-how integrated in the unit, wired and tested at the factory
- Open bus communication and simple expansion/scaling capacity
- At least 50% savings for investment/installation costs for the building automation system (BAS)

Traditional BMS-Solution

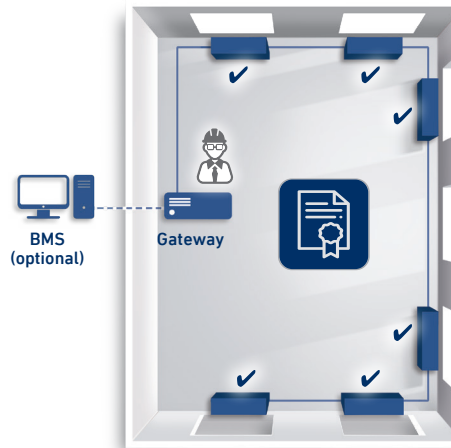
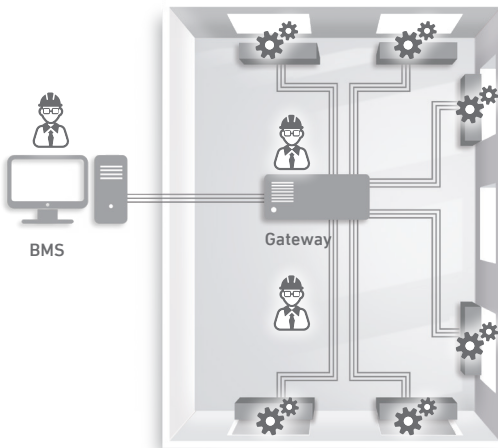


LTG Connected Intelligence



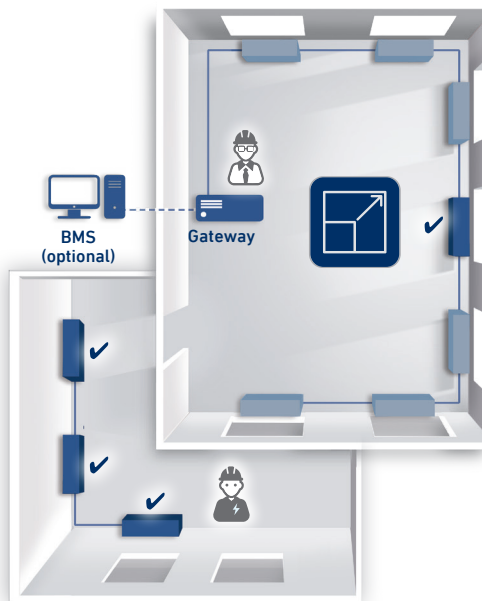
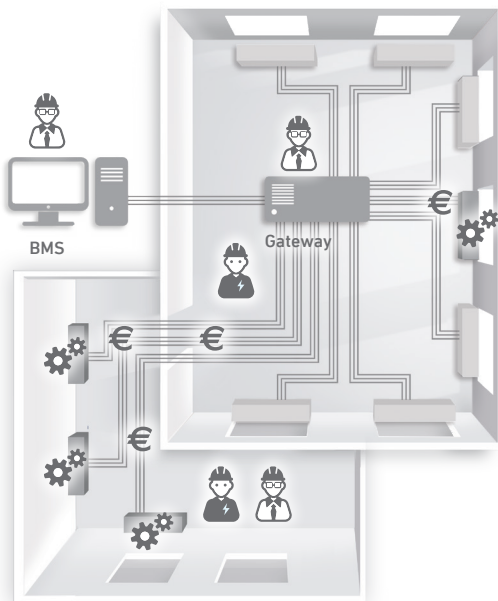
Cost savings

- Significant reduction of software/hardware data points and DDC costs thanks to more compact components resp. LTG boards
- Considerably reduced wiring work and error risk on the construction site



Verified/open systems

- Integrated and product-optimised control circuits for room temperature and air quality as well as heat recovery optimisation
- Open communication by use of Modbus as a protocol and available gateway components and converters



Flexible/scalable

- Inexpensive stand-alone solution for small zones (e.g. renovation of partial areas without BMS connection)
- Subsequent switching to a building management system resp. existing system is possible
- Subsequent expansion using different sensors without additional effort/modules



Electronic technician



BAS technician



Effort installation



Effort implementing



Verified LTG approved



**AIR TECH
SYSTEMS**

Comfort Air Technology

Air-Water Systems
Air Diffusers
Air Distribution

Process Air Technology

Fans
Filtration Technology
Humidification Technology

Engineering Services

Laboratory Test / Experiment
Field Measurement / Optimisation
Simulation / Expertise
R&D / Start-up

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