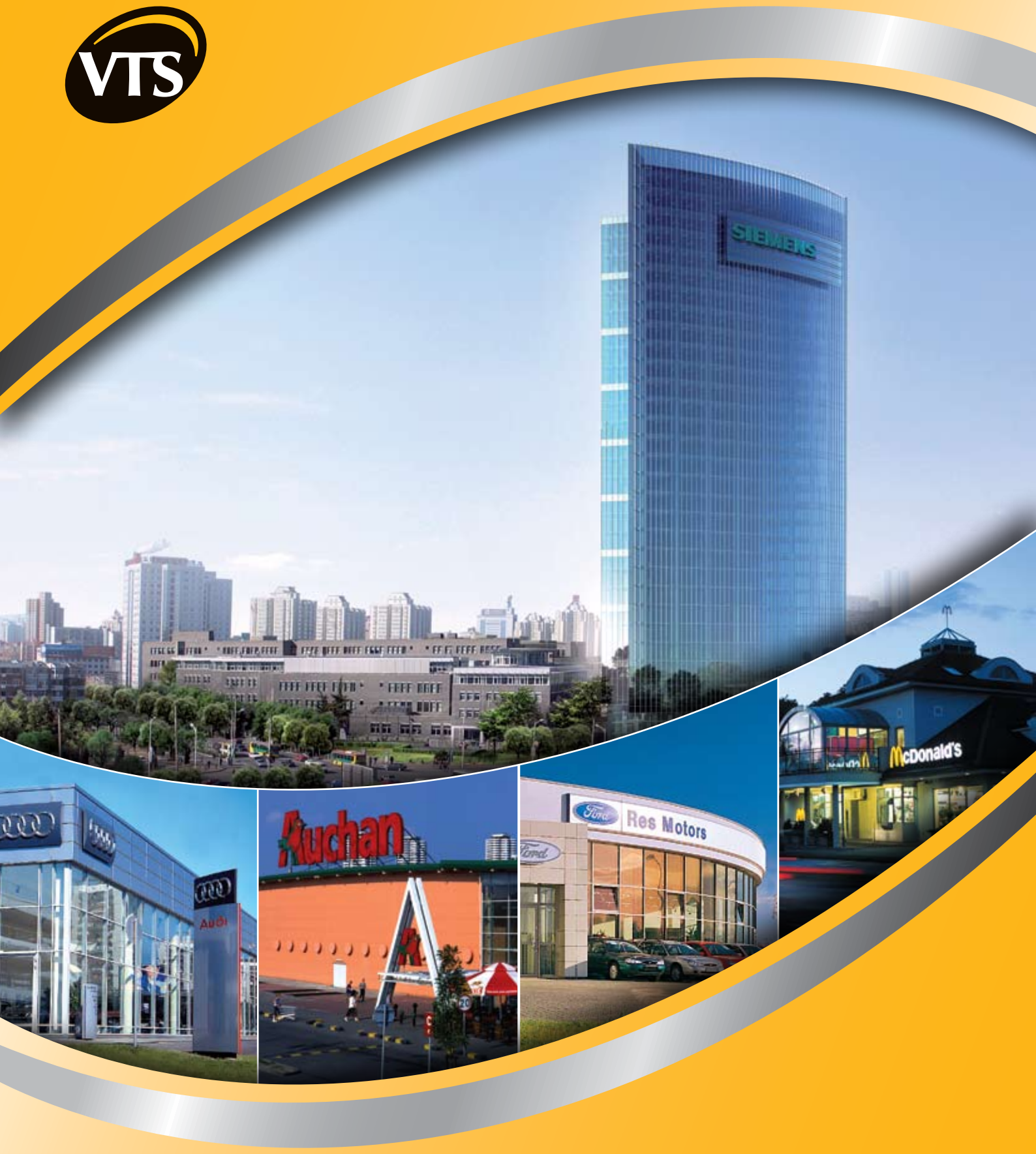
VTS



Reference book

Best VTS Air Handling Projects

ISO 9001 / ISO 14001

The ISO 9001 Quality Management System including: design, production, distribution and aftersales service, guarantees full persistency of all VTS products.

EUROVENT

Eurovent Certification proves the conformity of the stated AHUs' parameters calculated using our ClimaCAD On-line (CCOL) software, with the units' working performance.

Index

VTS – European roots 2
VENTUS made of expectations 3
Siemens 4
Biocon 6
Children's Memorial Health Institute "Pomnik - Centrum Zdrowia Dziecka" 8
Chemsunny Plaza 10
CNC Building 12
Coca Cola 14
Danfoss Factory 16
TRC Objora 18
Fencing centre 20
The Gorky Moscow Art Academic Theatre 22
Kopernik Housing Estate 24
Office center on Lenin Street 26
National Academy of Sciences of Republic of Kazakhstan 28
City Hall 30
Reception Home 32
Shanghai No.1 Hospital 34
Trade house ADEM 36
Toyota Lexus Showroom 38
Polish Security Printing Works 40
Certificates 42

bag filter | water cooler | cross flow exchanger | fan | glicol system | water heater | mixing | panel filter | rotary exchanger | silencer

PN-EN 1886 / PN-EN 13053

EN 1886 and EN 13053 are the two most important European branch-related standards specifying the parameters and construction of air handling units. The testing process is carried out by independent CEN-certified research organization (European Committee for Standardization) – TÜV Germany.

CE

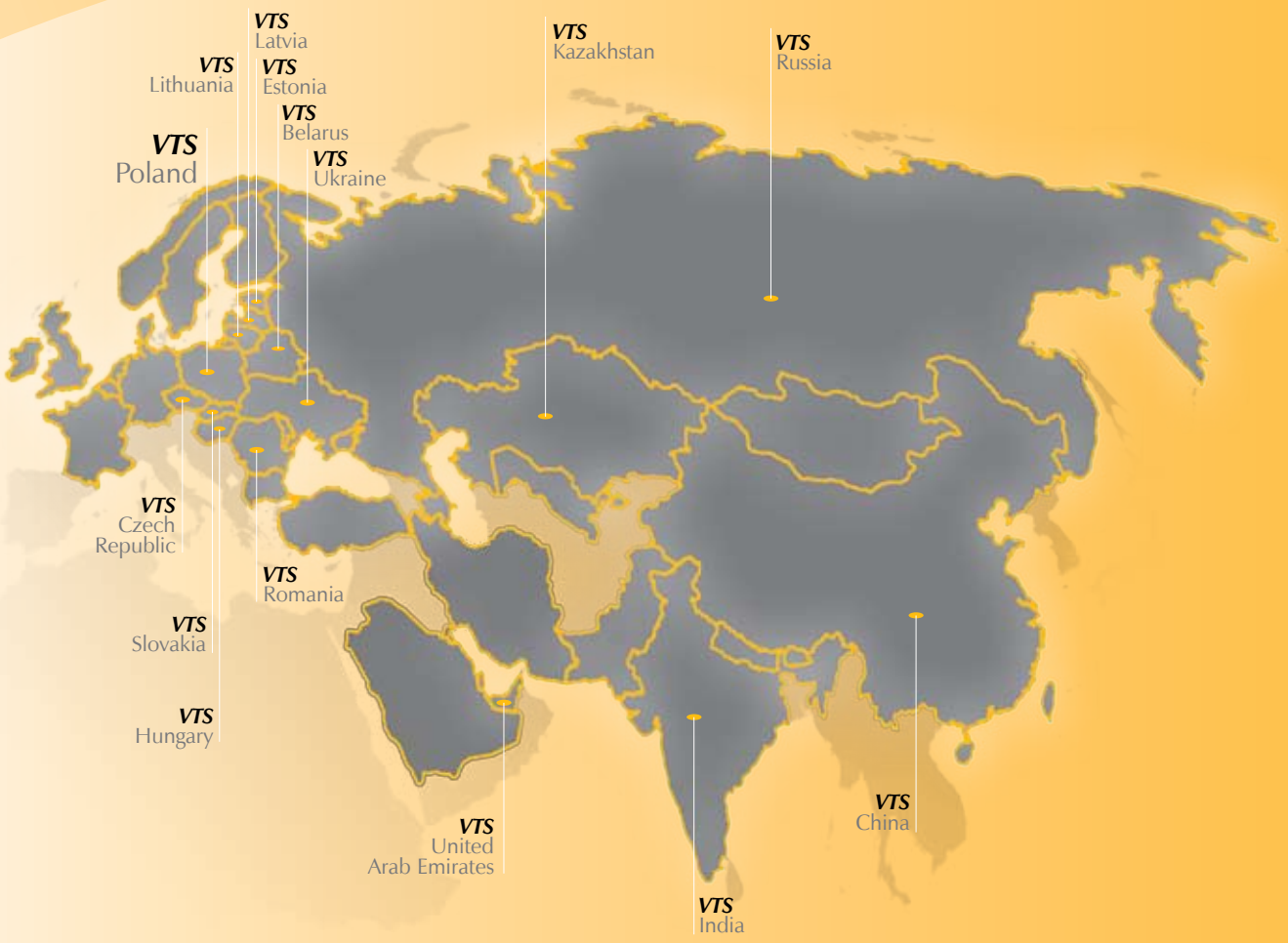
VTS products comply with the EU safety standards. Our AHUs have been tested according to the Low Voltage and Electromagnetic Compatibility directives. Additionally our AHUs comply with Machinery Directive.

VENTUS – VTS Air Handling Unit

VTS – European roots

VTS Group is a leading supplier in the ventilation and air conditioning trade. The company creates and implements innovative and technologically advanced solutions for all types of industrial facilities, commercial institutions and hotels. We are an international company with European roots and tradition of reliable quality, that has been providing people in 19 countries with perfect atmosphere for 20 years now. We monitor the market in detail and react to its changes immediately. Hence we are able to provide our clients with the best solutions that are perfectly tailored to their needs. Latitude or climate are not important. Our ventilation and air handling units guarantee comfort regardless of a facility's location. We are real experts in good climate…

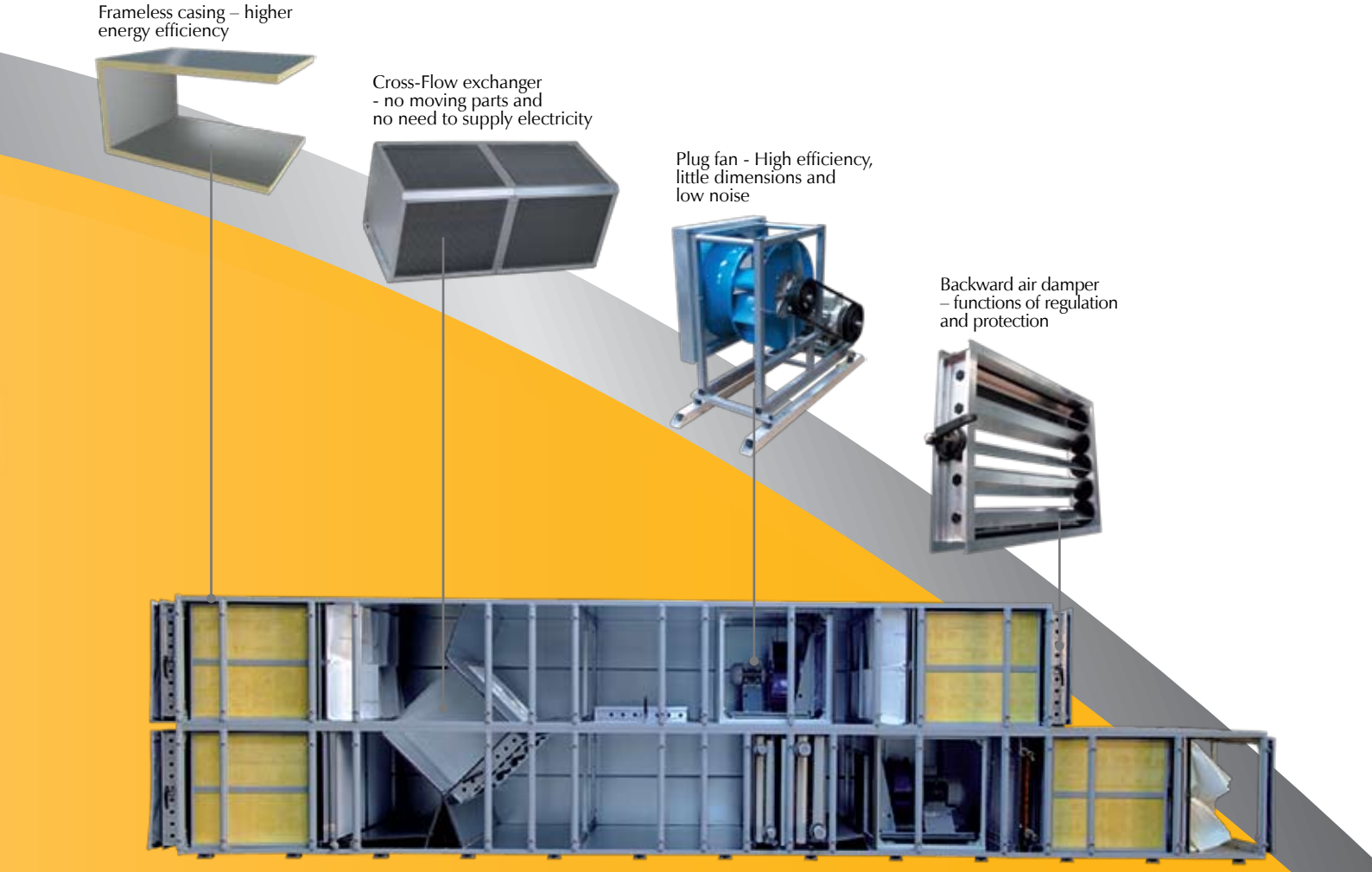
The quality and parameters of VTS devices are confirmed by international Eurovent and TÜV certificates. We comply with all requirements stemming from European (CE) product safety standards as well as the integrated quality and environment protection system ISO 9001/ISO 14001.



VENTUS made of expectations

VENTUS is a type-line of ventilation and air conditioning units offered by VTS Group. The functionality and application of the product reflect market demand and are the effect of intensive work of some experienced specialists in the trade. The AHU was designed with the use of state-of-the-art technologies, advanced material engineering and completely innovative constructional solutions. Due to that the AHU is reliable, energy-saving and fully adjusted to the expectations of the market.

We look at our AHUs from the angle of our Clients' needs. They can be applied regardless of weather conditions or geographical zones. Designing devices is incredibly simple thanks to our technical and commercial advisers as well as the ClimaCAD tool that makes it possible to prepare an AHU specification in just 4 steps. We have optimized the process of delivering AHUs to the construction site and created a team of qualified specialists to assemble them. We want the operation of devices to produce some notable benefits. Hence our special attention to energy recovery of our devices reaching up to 85%!
That is why VENTUS AHU type-line is made of expectations.



Siemens

Location: **Beijing, China**

Area: **59 393 m²**

Cubic measure being handled by VTS units: **189 500 m³**

Building characteristics

Purpose:
The building of Siemens Beijing Headquarters is a high-grade office building in Beijing Wangjing area, gathering Siemens's power, lighting, automation, building technology, and many other high-tech research results.

There are multi-functional areas of offices, conferences, exhibitions, garage-regions etc., which bring together with all the Siemens companies and departments from the northern region. With the total building investment of more than 1 billion RMB, this building became the landmark in Beijing's Fourth Ring Northeast.

Area: 59 393 m²

Cubic measure being handled by VTS units:
189 500 m³

The conception of ventilation system

As for a high-rise building, the set up of air conditioning system is classified into high and low areas. The hot and chiller water of the low area is supplied directly from the chiller and boiler, while the hot and chiller water of the high area is supplied by the plate heat exchanger.

The first floor of the building is lobby and reporting hall, using the centre air conditioning system coming with fresh air; B1 and B2 property management rooms use fresh air unit together with fan coil; Separate make-up air system is installed in the office area, with make-up air unit room located on each floor, and ceiling inducer at the end point. Considering the elimination of the cooling and heatting load of the construction, the landing fan coil is installed in the outside room.

The total rotary energy recovery unit is installed in the roof. The air is sent into mechanical room of each floor after cooling and dehumidification in the summer or heatting and humidification in the winter, and then sent into the office area.

Project AHUs functions

General characteristic of used devices			
Number of AHUs	37		
Configuration	Ventilation, Heater, Cooler, Filter, Rotary wheel and Fans		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	2 368	4 002,6	41%
Total supply AHUs electric power consumption [kW]	186,543		
Total exhaust AHUs electric power consumption [kW]	65,022		
Total supply Air Flow Rate [m^3/h]	365 600		
Total exhaust Air Flow Rate [m^3/h]	144 000		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	2,48	0,69	
Noise parameters for loudest units at 250Hz			
	Supply	**Exhaust**	
Inlet [dB]	88,9	89	
Outlet [dB]	87,9	85	
Enviroment [dB]	62,9	60	

Solution provided by VTS

In this project, VTS has provided a total of 37 units, including 5 rotary energy recovery air handling units, 4 VS300, 1 VS230; and the rest 32 units are supply air handling units with cooler, whose models are ranged from VS21 to VS180.

The rotary wheel units are used for the heat recovery of the exhaust air and the pretreatment of the make-up air, which come with the heater and cooler coils for further cooling or heating of the make-up air. After that, the make-up air is sent into the technical room of each floor and into the office region from the make-up air unit.

Biocon

Location: **Bangalore, India**

Area: **150 000 m²**

Building characteristics

Purpose:
Biocon is a research-driven, global healthcare company with a strong matrix of capabilities along the biopharmaceutical value chain. Biocon Focuses on unmet medical needs in cancer, diabetes and inflammatory diseases,with unique novel therapies on a platform of affordable innovation.

Biocon's custom research organisation, Syngene, offers high value discovery and development services, from target identification and validation to small molecule and library synthesis. With their reputation for meticulous IPR protection, Syngene provides pharmaceutical and biotechnology majors customised solutions in the areas of synthetic chemistry and molecular biology.

Area: 150 000 m²

The conception of ventilation system

The breadth and scale of Biocon's manufacturing technologies has dovetailed the transition from a niche player in specialty enzymes to a global provider of biopharmaceuticals spanning small molecules, recombinant proteins, peptides and monoclonal antibodies. These technologies encompass large-scale microbial fermentation, chemical synthesis, mammalian cell culture, protein & antibody purification, aseptic formulation and fill-finish.

The manufacturing facilities of Biocon and Syngene are designed to stringent cGMP standards and are supported by state-of-the-art process development and quality control laboratories and an efficient service infrastructure. For such a high profile unique facility, it is very much necessary to have optimum Air conditioning arrangements with the most modern state of the art equipments. They ideally have a necessity to maintain a temperature of around 22 degrees, +1 degree.

Part of the buildings require Ventilation system to circulate fresh air into the buildings, and part of the buildings require further cooling of the supplied air, which is carried out with the help of peripheral systems using 100% of the recirculation air. Automated Building Management System (BMS) is applied for supervising the operation of the ventilation system and supporting systems.

Project AHUs functions

General characteristic of used devices		
Number of AHUs	54	68
Configuration	Fan, Filter	Panel Filter, Cooler, Fan, Fine Filter
Operational parameters		
Total AHUs cooling capacity [kW]	3 048	
Total supply AHUs electric power consumption [kW]	271	
Total exhaust AHUs electric power consumption [kW]	347	
Total supply Air Flow Rate [m^3/h]	509 059	
Total exhaust Air Flow Rate [m^3/h]	1 017 004	
Average SFP [kW/m^3/s]/[W/m^3/h]	0,55	0,30
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	82,84	81,90
Outlet [dB]	85,64	83,76
Enviroment [dB]	74,89	71,31

Solution provided by VTS

VTS has supplied 51 No's of Air Handling units, 65 No's Ventilation units and 6 No's of Treated Fresh Air Units at the site of Biocon and Syngene, ensuring complete treatment of outside air along with the various stages of air filtrations. The combination of SISW plug fans, either direct driven or belt driven, have been used by the designer in optimum manner, so as to enhance air circulation as required.

The innovative anti-corrosive casing of Ventus AHU's made it more convenient to protect the machines from pollution and other damages. Finally, with the use of Ventus AHU's, it has been possible for them to reduce electrical energy consumption to a great extent, leading to a win-win situation for the end user.

Children's Memorial Health Institute "Pomnik - Centrum Zdrowia Dziecka"

Location: **Warsaw, Poland**

Building characteristics

Purpose:
The Children's Memorial Health Institute ("Pomnik - Centrum Zdrowia Dziecka") is considered as the most modern children's hospital in Poland.

The institute was established in 1977 as a complex of specialised clinics, and since 1980 it has been providing its services as the multi-specialisation paediatric hospital.

The institute obtained the status of the research and development unit of the Ministry of Health, and therefore its activity includes the treatment, rehabilitation, scientific work, and training.

The conception of ventilation system

The project of the modernisation of the whole system was based on the completely new concept of the system and included a new arrangement of particular lines of the ventilation network. While defining the directives for the functionality of the system, particular emphasis was put on two aspects of its operation: the air quality from the point of view of its asepsis, thermal and humidity parameters, and the minimisation of the generated noise.

The realisation of the directives on the air quality resulted in the application of a series of filters, starting from the air intake module, equipped with the dust chamber, shared by the whole system, through the EU9 filters installed in the ventilation units, through the HEPA filters mounted at the final sections of particular ducts. The proper humidity of the supplied air, in particular in winter, is maintained by the devices for zone humidifying based on the steam humidifiers that introduce the steam directly to particular lines of the ventilation network. To minimise the noise level in adjacent rooms, the project plans a series of sound insulating sections that constitute an integral part of the ventilation unit.

Project AHUs functions

General characteristic of used devices		
Number of AHUs	12	
Configuration	supply-exhaust, Glycol system EU9, Silencers	
Operational parameters		
Total AHUs heating capacity [kW]	562	
Total supply AHUs electric power consumption [kW]	23,531	
Total exhaust AHUs electric power consumption [kW]	18,045	
Total supply Air Flow Rate [m^3/h]	54 600	
Total exhaust Air Flow Rate [m^3/h]	45 400	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	0,76	2,74
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	82,6	81,5
Outlet [dB]	66,2	85,4
Enviroment [dB]	65,5	61,4

Solution provided by VTS

To comply with the specific requirements of the ventilation installations that result from the purpose of the system, VTS used the ventilation units equipped with glycol systems for energy recovery.

Due to this solution the complete separation of the supply air from the exhaust air was assured, which is the basic requirement for systems operating in aseptic rooms. All the units that supply the air to the hospital rooms are equipped with noise suppressors. It provided full acoustic convenience both for the patients and the personnel.

Chemsunny Plaza

Location: **Beijing, China**

Area: **194 000 m²**

Cubic measure being handled by VTS units: **320 000 m³**

Building characteristics

Purpose:
The building ground floor was designed as service area comprises of bank, post office, commercial center, conference centre, top brand exhibition centre, restaurants etc. The upper floors are prime office area with 5A intelligence building service facility.

Area: 194 000 m²

Cubic measure being handled by VTS units:
320 000 m³

The conception of ventilation system

The project of the ventilation system, on account of the building's character and capacity, assumed high level of economical solutions in the fields of heat recovery, electric energy economy and limitations in assembly surface.

Taking the heat load variability of individual floors of the building into consideration, ventilation air treatment was divided into two stages: main and 'individual' one. The first stage of preparing air aimed at maximum global heat and cool recovery from individual local ventilation networks total capacity of approx. 370 000m³/h.

At the next stage the air was to be supplied to each floor with 'individually' adjusted heat and humidity parameters. In order to reduce the costs related to preparing technical rooms, base units were moved to the roof of the building.

Due to that fact devices designed for outdoor operation (tOUT=46°C) had to satisfy high requirements concerning the resistance to weather conditions and low energy loss through the casing's walls. Only 'peripheral' sets responsible for secondary treatment of ventilation air operating within the range of low resistances of the ventilation network and facilitating the reduction of noise were left of each floor.

Project AHUs functions

General characteristic of used devices			
Number of AHUs	12		
Configuration	Filters, Rotary Regenerator, Fans		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	2 007	6 275	68%
Total AHUs cooling capacity [kW]	3 147	4 362	28%
Total supply AHUs electric power consumption [kW]	254		
Total exhaust AHUs electric power consumption [kW]	155		
Total supply Air Flow Rate [m^3/h]	372 000		
Total exhaust Air Flow Rate [m^3/h]	272 000		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	3,95	1,1	
Noise parameters for loudest units at 250Hz			
	Supply	**Exhaust**	
Inlet [dB]	92	88	
Outlet [dB]	96	92	
Enviroment [dB]	67	64	

Solution provided by VTS

As a result VTS company delivered 12 supply and exhaust AHUs for the main air treatment with the capacity of approx. 30 000m^2/h each. The devices were equipped with highly efficient cross-flow regenerators responsible for energy recovery in winter and summer and their parameters were even better than those required in the project.

According to the recommendations of the contractor the ventilation units installed on the roof are characterized by high heat resistance ('sandwich' type panels filled with polyurethane foam), appropriate weight (compact structure), limited electric energy consumption (highly efficient 'PLUG' type fans).

Division of the main air treatment system into several independent ones enabled additional energy savings related to the possibility of cycle operation of a group of floors.

CNC Building

Location: **Beijing, China**

Area: **60 000 m²**

Cubic measure being handled by VTS units: **180 000 m³**

Building characteristics

Purpose:
Multi-function office complex building comprise office convention center, multi-function hall, operation center and telecommunication museum.

Area: 60 000 m²

Cubic measure being handled by VTS units:
180 000 m³

The conception of ventilation system

The building HVAC system shall be equipped by Air Handling Units with total air quantity of approx. 400 000m³/h, for better air quality and zone independent temperature control, VAV (variable air volume) system incorporating high efficiency air filters was used. During the partload operation the supply air quantity will be automatically regulated to suit each individual zone's cooling and heating requirements. Hence,fan power and the corresponding energy supply are reduced. Due to roof space constrain, The AHUs located in the plant room of each respective floor. Hence, compact size unit with smaller dimensions were specified. The HVAC system was to satisfy the temperature indoor at winter/summer 21/25°C. The central Chiller/ Boiler plant capacity shall be reduced by applying energy recovery system. Energy recovery efficiency requirement should be minimum 75%.The unit shall also to include a mixing box with bypass damper allow free cooling/heating during the transitional season. Other requirements include UV light and Humidifier.

Project AHUs functions

General characteristic of used devices			
Number of AHUs	24		
Configuration	Filters, Rotary Regenerator, Mixing, Heater, Cooler, Fans		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	1 626	4 123	56%
Total AHUs cooling capacity [kW]	3 114	3 524	12%
Total supply AHUs electric power consumption [kW]	295		
Total exhaust AHUs electric power consumption [kW]	189		
Total supply Air Flow Rate [m^3/h]	396 000		
Total exhaust Air Flow Rate [m^3/h]	396 000		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	2,2	0,61	
Noise parameters for loudest units at 250Hz			
	Supply	**Exhaust**	
Inlet [dB]	76	82	
Outlet [dB]	89	80	
Enviroment [dB]	61	57	

Solution provided by VTS

VTS has proposed 24 sets of AHUs with the supply flow rate of 19 000m^3/h and 13 000m^3/h respectively to meet the developer's requirement.Unit with rotary regenerators type energy recovery system has the highest efficiency of 86% satisfied with the

mininmun heat efficiency specified by the developer. Following feature of VTS unit convince the develper to select VTS from strong competitors from the US and Europe region:

- Compact unit size
- Low unit infiltration rate
- Low unit casing leakage rate
- Durable unit casing structure
- Low noise level PLUG fan

Coca Cola

Location: **Radzymin, near Warsaw, Poland**

Building characteristics

Purpose:
Industrial object belonging to the food industry company that specialises in mass production of beverages.

In 2006 the plant was expanded with a logistics centre within the framework of the development and modernisation works of the plant in Radzymin; the plant is one of the four production plant of Coca-Cola HBC Polska Sp. z o.o.

The conception of ventilation system

The superior feature required from the devices that provide proper air ventilation in a big production plant that specialises in the food industry is the guarantee of complying with the hygienic requirements. Owing to this, the investor demanded that the ventilation system be totally aseptic.

This requirement concerned not only the developed network of ventilation ducts, but also the ventilation units that operate the whole system. The project planned that the total process of air filtration would be operated both by the ventilation units, and the further sections of the ducts.

Therefore, the designer decided that the air filtration would be realised by the AHUs at the EU9 level, while the further air purification by means of the duct filters at the EU13 level. Another requirement related to the aseptic condition of the production rooms ventilation was the elimination of sucking in the external air by possible leakage of the building.

Consequently, a typical solution was applied that consisted in maintaining constant overpressure in the production halls through the diversification of the capacities of the supply and exhaust units.

Project AHUs functions

General characteristic of devices		
Number of AHUs	4	
Configuration	cross-plate exchanger, heating, cooling, Glycol system	
Operational parameters		
Total AHUs heating capacity [kW]	310	
Total supply AHUs electric power consumption [kW]	33,887	
Total exhaust AHUs electric power consumption [kW]	33,512	
Total supply Air Flow Rate [m³/h]	55 740	
Total exhaust Air Flow Rate [m³/h]	68 580	
Average SFP [kW/m³/s]/[W/m³/h]	0,98	3,54
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	77,1	79
Outlet [dB]	80	74,5
Enviroment [dB]	57,6	53

Solution provided by VTS

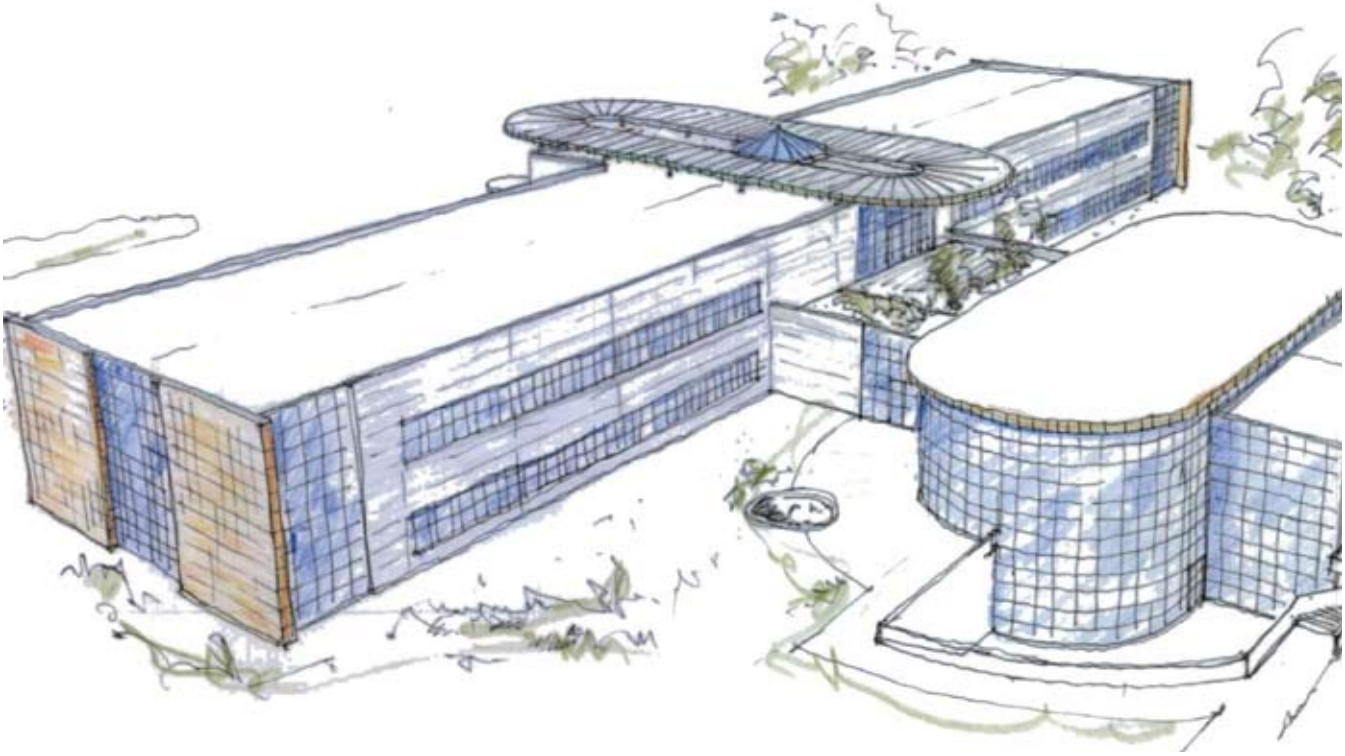
The requirements concerning the hygiene in conjunction with the necessity of energy recovery in the ventilation system made us use such a configuration of AHUs that could guarantee the best possible separation of the supply and exhaust air. The hall in which the Naste beverages are produced is operated by three sets of supply and exhaust VENTUS AHUs: two of them have the recovery system based on the cross-flow exchanger, and one of them uses the glycol system.The total air capacity of the AHUs with reference to cubic capacity of the production halls guarantees the 40-time air exchange per one hour of their operation. The operation of all used AHUs is realised by means of the VTS control automatics system. At the specific request of the investor, the AHU feeding and controlling system was configured in accordance with these requirements by authorised service of VTS.

Danfoss Factory

Location: **Moscow, Russia**

Area: **40 000 m²**

Cubic measure being handled by VTS units: **140 000 m³**



Building characteristics

Purpose:
Dynamic growth in the Russian market's demand for the products of the refrigeration and electric power systems trade eventually resulted in the construction of a production plant owned by one of the biggest producers in this branch of the HVAC trade – the Danfoss corporation located in the outskirts of Moscow.

Area: 40 000 m²

Cubic measure being handled by VTS units:
140 000 m³

The conception of ventilation system

Depending on the purpose of individual zones of the state of the art production and office complex the ventilation system has been given a specific 'package' of tasks referring to air treatment in the field of 'comfort air' or securing appropriate air quality and temperature parameters necessary for technological processes. Significant surface of the office building forced the designer to divide the system into several more energy-saving sub-systems responsible for central air treatment of specific groups of rooms with similar heat load. In the next stage the air is heated up or cooled down with the use of zonal devices to temperatures 20÷22°C individually chosen for specific rooms. Additionally the ventilation system is supported by the floor heating/cooling system.

The requirements of a ventilation system of a production room, especially visible in significant amount of heating and cooling power, have resulted in the necessity of applying efficient methods of energy recovery. The 'purity' of the production process enabled the usage of a part of warm/cool exhaust air in the process – recirculation.

The glycol system was applied as the next stage of utilizing the 'used up' air. The decision concerning the implementation of such a solution of an indirect energy recovery resulted from the necessity of separating the supply AHU from the exhaust system.

Project AHUs functions

General characteristic of used devices			
Number of AHUs	14		
Configuration	Filters, Glycol System, Mixing, Heater, Cooler, Fans		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	846	450	40%
Total AHUs cooling capacity [kW]	350		
Total supply AHUs electric power consumption [kW]	74		
Total exhaust AHUs electric power consumption [kW]	30		
Total supply Air Flow Rate [m^3/h]	96 530		
Total exhaust Air Flow Rate [m^3/h]	69 300		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	3,86	1,07	
Noise parameters for loudest units at 250Hz			
	Supply	**Exhaust**	
Inlet [dB]	92	85	
Outlet [dB]	94	90	
Enviroment [dB]	66	82	

Solution provided by VTS

The scope of VTS' responsibilities covered the delivery of a group of supply as well as supply and exhaust AHUs from the VENTUS typelines.

According to the technical specification the devices have been equipped with specific configurations of sub-assemblies responsible for thermal treatment. In the case of the most important component – the fan set – the producer has applied highly efficient PLUG fans.

All ventilation systems as well as other supporting systems are working in a full monitoring system (BMS).

TRC Objora

Location: **Donetsk, Ukraine**

Area: **22 000 m²**

Cubic measure being handled by VTS units: **10 700 m³**

Building characteristics

Purpose:
The one of the biggest shopping and entertainment centers in Donetsk city, "Objora", is granting to its visitors the wide offer of products and services. On the first floor of building a superstore is situated, all upper floors are destined to shops and boutiques. TRC «Objora» is favorable differing in Donetsk city by accepted architectural and engineering solutions.

Area: 22 000 m²

Cubic measure being handled by VTS units:
10 700 m³

The conception of ventilation system

During the system of ventilation and air conditioning designing the next solutions were accepted:

- The general ventilation system with heating and cooling functions was used on object. The energy recovery function is provided,
- The microclimate in separately room is realized by room terminals using. Room terminal type (console, channel, cassette) is depending from room type and leaser preferences,
- Air tap from equipment with high heat generation is realized by local exhaust systems,
- Cooling agent in general ventilation system is water which supplied in cooling contour by outdoor refrigerating units,
- Heating agent in general ventilation system is hot water.

Project AHUs functions

Solution provided by VTS

To general ventilation of building realization 14 VENTUS units were assembled. In view of high costs of energy carriers in Ukraine the systems with energy recovery were used – 10 supply-exhaust units are equipped with rotary regenerator. The energy recovery systems' using is noticeable decreasing the operating costs on heating agent in cold season. The plug fans with reduced electric power consumption and low noise were used in fan sections.

The frequency converters presence allows organizing a guard mode of units working which also bringing down electric power consumption. Because of demands to noise level minimization which radiating by ventilation unit, all units are equipped with silencers sections.

The precise maintenance of desired air parameters is provided by factory control systems VENTUS which also allows including the ventilation system in dispatch control system of the whole shopping center.

General characteristic of devices		
Number of AHUs	18	
Configuration	Filter, Fan, Heater, Cooler, Silencer, RRG	
Operational parameters		
Total AHUs heating capacity [kW]	754	
Total AHUs cooling capacity [kW]	364	
Total supply AHUs electric power consumption [kW]	56,4	
Total exhaust AHUs electric power consumption [kW]	34,8	
Total supply Air Flow Rate [m^3/h]	93 876	
Total exhaust Air Flow Rate [m^3/h]	57 852	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	3,49	0,97
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	83	86
Outlet [dB]	78	92
Enviroment [dB]	78	79

Fencing centre

Location: **Beijing, China**

Area: **7 070 m²**

Cubic measure being handled by VTS units: **20 000 m³**

Building characteristics

Purpose:
The construction of Fencing Exercise Hall, Research Building and Swimming Training Hall of the Fencing Sport Administration Center, 2008 Beijing Olympic, is constructed under the charge of the Olympic Venues of the State Sport General Administration of P. R. China and the State Administration Office of Training Facilities Construction.

The 3rd-overground Fencing Exercise Hall, 5 tiers in some parts, is currently the first class Fencing Hall all over the world, which can hold various international competitions and will play an important role in 2008 Beijing Olympic Games.

Area: 7 070 m²

Cubic measure being handled by VTS units:
20 000 m³

The conception of ventilation system

The ventilation system is set up separately in the office and training hall for controlling flexibility and energy-saving operation. VRV system is used in the operating room. The Competition Hall is installed with the centre air system, of which air handling unit is double fan, which fulfills the requirements of full exhaust air and make-up air.

Therefore it can not only meet the needs of air-conditioning and heating but also exchange the fresh air. Owing to the high space and over 8m's air supply distance, circular swirl air inlet is used for the supply air inlet. Return air inlet is also set up on one side of the building to reduce the transmission distance of the return air and to ensure the uniform air supply and smooth return air as well.

General characteristic of used devices			
Number of AHUs	4		
Configuration	Ventilation, Heating coil, Filter and Empty section, Fans		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	1 368,8	2 403,8	43%
Total supply AHUs electric power consumption [kW]	73,635		
Total exhaust AHUs electric power consumption [kW]	60,276		
Total supply Air Flow Rate [m^3/h]	140 000		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	3,44	0,96	
Noise parameters for loudest units at 250Hz			
	Supply		
Inlet [dB]	93,9		
Outlet [dB]	91,9		
Enviroment [dB]	64,9		

Solution provided by VTS

In this project, VTS provides 4 units in accordance with the design requirements, 3 VS300 supply-exhaust air handling units to provide fresh air, air-conditioning and heating for the training hall, 1 VS230 unit for the air conditioning and ventilation of the office area. In order to meet air supply effect, the total pressure of VENTUS unit is set to 1198 Pa, which is fully able to meet the pressure requirements of the swirl diffuser.

Operating supply-exhaust air handling units in the hottest or coldest month, with the appropriate reduction of the make-up air flowrate, so the return air function can be used for the purpose of energy-saving operation, while in the transitional seasons, double fan can be used for full make-up air operation, which can provide air-conditioning and fresh air for the Competition Hall without any energy expense.

The Gorky Moscow Art Academic Theatre

Location: **Moscow, Russia**

Area: **2 000 m²**

Cubic measure being handled by VTS units: **50 000 m³**

Building characteristics

Purpose:
The Gorky Moscow Academic Art Theatre is located in a glamorous complex of culture and entertainment centres in the capital city of Russia. The theatre room can seat a group of 1350 viewers.

The prestige of the building constructed in 1972 and the frequency of organized performances and other cultural events influenced the decision concerning the theatre's renovation including an air conditioning system in all rooms of the building.

Area: 2 000 m²

Cubic measure being handled by VTS units:
50 000 m³

The conception of ventilation system

Whole air conditioning system is responsible for the microclimate of the theatre auditorium and delivery of necessary amount of ventilation air at a required temperature. Channelling air to each zone of the auditorium and the stage had to be accompanied by the lowest possible air flow velocity at the lowest noise. The height of the room (15m) in relation to the real height of the working space (approx. 2m) for which it was necessary to guarantee heat comfort forced the application of a 'bottom – top' air flow system (ground floor, balconies).

Vast amount of thermal energy generated from the heat gained from viewers and the lighting is successfully used as recirculation air in the biggest capacity installations (50 000m³/h). Appropriate relative air humidity in the theatre room is maintained with the help of humidifiers installed inside AHU's empty spaces.

The aspect of the 'silence comfort' of a working AHU has been realized thanks to low air flow velocities in the whole. As the majority of technical rooms are located in the basements, it was necessary to assembly all units at the place of their installation. In the case of exhaust system, the designer used some of the working fan sets placed on the top floor of the theatre and installed some additional exhaust AHUs.

Project AHUs functions

General characteristic of used devices			
Number of AHUs	11		
Configuration	Filters, Mixing, Heater, Cooler, Humidifier, Fan, Silencer		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	250	425	41%
Total supply AHUs electric power consumption [kW]	181		
Total exhaust AHUs electric power consumption [kW]	61		
Total supply Air Flow Rate [m^3/h]	245 000		
Total exhaust Air Flow Rate [m^3/h]	196 330		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	3,56	0,99	
Noise parameters for loudest units at 250Hz			
	Supply	**Exhaust**	
Inlet [dB]	86	84	
Outlet [dB]	69	79	
Enviroment [dB]	78	79	

Solution provided by VTS

In the light of the principles of the modernized installation design VTS delivered 11 VENTUS units of the capacity range of 3000÷53000m^3/h. The biggest ones provide ventilation for the theatre room.

The remaining, guarantee heat comfort in dressing rooms, rehearsal rooms, offices and realize an appropriate air exchange in the zone of stage lightning systems as well as other technical devices.

All installed and working sub-systems are monitored by the BMS central monitoring system responsible for appropriate usage of each ventilation system and supporting systems.

Kopernik Housing Estate

Location: **Moscow, Russia**

Area: **40 000 m²**

Cubic measure being handled by VTS units: **140 000 m³**

Building characteristics

Purpose:
The Kopernik House has its origins in the technological epoch of the construction industry. It is as wonderful and majestic as the whole Universe. The monolithic-brick house was individually created in the workshop of Tkachenko S.B. The complex is a 6-section, 6-15-storey building which houses 146 apartments.

The first two floors are occupied by the 'Observatory' restaurant and a two-storied multi- sport club.

Area: 40 000 m²

Cubic measure being handled by VTS units:
140 000 m³

The conception of ventilation system

The building's technological advancement and its purpose unambiguously imposed a mechanical type of the ventilation system in the field of 'air comfort'.

A concept of a 'double-stage' system suggested by the system's designer carries out individual tasks according to the following order:

- Ventilation AHUs
  - securing an appropriate number of air exchanges in relation to the type of a room,
  - maintaining required indoor air temperature of 20°C in the winter
- Set of zonal duct 'fan-coils' in the VRV system
  - thermal recirculation air treatment in the 'warm' periods of the year according to the users' needs individually

The location of AHUs in the underground part of the building and in its attic as well as the schedule of projected assembly works in the final stage of the construction imposed the necessity of delivering ventilation units in elements to be assembled directly on the place of their destination.

As the investment was carried out in the context of an 'intelligent building' the operation of all installed mechanical and electrical devices including ventilation ones, is monitored with the help of the BMS system

Project AHUs functions

General characteristic of used devices			
Number of AHUs	27		
Configuration	Filters, Heater, Fan Silencer / Filter, Silencer, Fan		
Operational parameters			
	Energy recovery	**No energy recovery**	**Economy [%]**
Total AHUs heating capacity [kW]	976		
Total supply AHUs electric power consumption [kW]	117,44		
Total exhaust AHUs electric power consumption [kW]	81,23		
Total supply Air Flow Rate [m^3/h]	167 720		
Total exhaust Air Flow Rate [m^3/h]	160 120		
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	4,26	1,18	
Noise parameters for loudest units at 250Hz			
	Supply	**Exhaust**	
Inlet [dB]	92	94	
Outlet [dB]	98	97	
Enviroment [dB]	67	72	

Solution provided by VTS

27 ventilation AHUs, delivered for the needs of the facility, were appropriately divided and grouped into supply and exhaust systems. Among typical configurations of supply devices there were also units equipped with a so called reserve fan set intended for the garage zone.

All units were equipped with fan sets with direct drive and due to this fact the investor received a product more economical in operation. Along with high efficiency of the fans the elimination of the belt transmission reduced the failure frequency of the system and limited the frequency of service (V-belt replacement).

Office center on Lenin Street

Location: **Zaporozhye, Ukraine**

Area: **9 000 m²**

Cubic measure being handled by VTS units: **7 500 m³**

Building characteristics

Purpose:
Office center on Lenin Street is a class B building and it is situated at business center of Zaporozhye city – dynamic-developing regional center of Ukraine.

Selected architectural and engineering solutions were called to create a maximum level of comfort for clients of office center.

Area: 9 000 m²

Cubic measure being handled by VTS units:
7 500 m³

The conception of ventilation system

During ventilation and air conditioning system designing as a part of engineering systems of building, the next designed solutions were accepted:

- The overheated water is a coolant in ventilation system,
- The air cooling is realized by coils with direct evaporation what are working with condensing units,
- To obtain an individual microclimate in the rooms, the channel air-conditioners are used.

Project AHUs functions

General characteristic of devices		
Number of AHUs	8	
Configuration	Filter, Fan, Cooler, Heater, RRG	
Operational parameters		
Total AHUs heating capacity [kW]	298	
Total AHUs cooling capacity [kW]	357	
Total supply AHUs electric power consumption [kW]	26,5	
Total exhaust AHUs electric power consumption [kW]	23,4	
Total supply Air Flow Rate [m^3/h]	63 000	
Total exhaust Air Flow Rate [m^3/h]	63 000	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	2,85	0,79
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	80	83
Outlet [dB]	89	89
Enviroment [dB]	76	75

Solution provided by VTS

In compliance with designed solutions and building purpose, 8 supply-exhaust units VENTUS were bought to realize a general ventilation. Average air changes per hour is 3,5. Because of high cost of heating and cooling agents, solution to use systems of energy recovery (rotary regenerators) was accepted. This solution allows to greatly decreasing consumption of heating and electric power. Also the frequency converters presence allows realizing of different working modes of ventilation system to additional operating costs decreasing in nonworking time. In view of heightened demands to quality of desired air parameters maintenance, all of air handling units are equipped with complete factory control systems VENTUS which allows in future to integrate a ventilation system in common computerized system of building management (BMS).

National Academy of Sciences of Republic of Kazakhstan

Location: **Almaty, Kazakhstan**

Cubic measure being handled by VTS units: **100 000 m³**

Building characteristics

Purpose:
The National Academy of Sciences of the Republic of Kazakhstan was founded in 1946 as a state institution that joins active members (academicians), corresponding-members and leading scientists of the Republic.

The main activity of the Academy is scientific research, analysis and prognosis of science development; priority directions of science development and scientific personnel training; scientific and expert provision and formation and coordination of scientific programs.

Cubic measure being handled by VTS units:
100 000 m³

The conception of ventilation system

Reception Home is situated in the center of Almaty. This historical place is used to have prestige and it's kind of brand of high level service. First Ven Ball, Grand Ball Room and green Ball Room party was held here.

The perfect restorant and rest zone are also situated inside home. In few world Reception home - it's a plac where you can have meeting and where you'll have good rest.

In this case solition of air condition is one of the goals! The AHU's of VTS company is working there for a long time!

Project AHUs functions

General characteristic of devices		
Number of AHUs	46	
Configuration	Bagl Filter, Heater, Cooler, Fan, mixing box, rotary regenerator	
Operational parameters		
Total AHUs cooling capacity [kW]	272	
Total AHUs heating capacity [kW]	3 390	
Total supply AHUs electric power consumption [kW]	122,6	
Total exhaust AHUs electric power consumption [kW]	5,42	
Total supply Air Flow Rate [m^3/h]	281 790	
Total exhaust Air Flow Rate [m^3/h]	12 150	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	1,8	0,51
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	89,7	82,3
Outlet [dB]	93,7	88,3
Enviroment [dB]	80,3	74,9

Solution provided by VTS

The cooperation between VTS and the investor's representatives resulted in a delivery of 46 supply AHUs ensuring complete outside air treatment 2 units with rotary regenerator and 3 of them with mixing box.

The required 'silent' operation of zonal AHUs equipped with PLUG fans with direct drive breaks the stereotype concerning the necessity of applying 'forward curved' radial fans in such cases.

The flat construction of the VENTUS AHU's casing was another strong asset for using them as peripheral devices suspended under the ceiling.

City Hall

Location: **Odessa, Ukraine**

Area: **6 000 m²**

Cubic measure being handled by VTS units: **12 000 m³**

Building characteristics

Purpose:
The Odessa City Hall building is an architectural memorial and it is situated in center of the city almost near Black Sea. Deputies are holding sessions and taking a significant for city citizens decisions in the sessionals rooms of City Hall.

Comfort conditions in the working places of City Hall building is a pledge of productive functioning of city officials.

Area: 6 000 m²

Cubic measure being handled by VTS units:
12 000 m³

The conception of ventilation system

In process of systems of ventilation and air conditioning designing it was made on next manner:

- Ventilation system is implementing an air heating of all City Hall rooms,
- In view of interruptions in heating agent supply, all air handling units are equipped with electric pre-heating,
- To decrease costs on energy carriers an energy recovery systems were used,
- The water is cooling agent in general ventilation system. Cooling agent is supplied from outdoor refrigerating units.

Project AHUs functions

General characteristic of devices		
Number of AHUs	12	
Configuration	Filter, Fan, Cooler, Heater, RRG, PCR, Pre-Heater	
Operational parameters		
Total AHUs cooling capacity [kW]	276	
Total AHUs heating capacity [kW]	574	
Total supply AHUs electric power consumption [kW]	23,4	
Total exhaust AHUs electric power consumption [kW]	21,6	
Total supply Air Flow Rate [m^3/h]	48 040	
Total exhaust Air Flow Rate [m^3/h]	50 040	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	3,2	0,89
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	79	80
Outlet [dB]	80	86
Enviroment [dB]	75	73

Solution provided by VTS

To providing a general ventilation system and air heating system the 12 VENTUS units were bought and assembled on object. An average air changes per hour in the City Hall rooms is 4. In compliance with demands concerning energy saving, all air handling units are equipped with energy recovery tools – rotary regenerators or cross-flow recuperators. The cross-flow recuperators are using in the hanging units which do not allows using a rotary heat exchanger. The frequency converters and speed governors are using for soft control of air handling unit productivity. Besides the energy recovery systems, the plug fans using allows decreasing of operation costs. Given type of fans provide more quiet units working and reduced electric power consumption in comparison with V-belt drive fans. The electric air pre-heating is used for heating function reservation.

Reception Home

Location: **Almaty, Kazakhstan**

Cubic measure being handled by VTS units: **100 000 m³**

Building characteristics

Purpose:
Restourant, meeting and rest zone

Cubic measure being handled by VTS units:
100 000 m³

The conception of ventilation system

Reception Home is situated in the center of Almaty. This historical place is used to have prestige and it's kind of brand of high level service.

First Ven Ball, Grand Ball Room and green Ball Room party was held here. The perfect restorant and rest zone are also situated inside home. In few world Reception home - it's a plac where you can have meeting and where you'll have good rest.

In this case solition of air condition is one of the goals! The AHU's of VTS company is working there for a long time!

Project AHUs functions

General characteristic of devices		
Number of AHUs	11	
Configuration	Bagl Filter, Heater, Cooler, Fan, mixing box	
Operational parameters		
Total AHUs cooling capacity [kW]	190	
Total AHUs heating capacity [kW]	1 329	
Total supply AHUs electric power consumption [kW]	57	
Total exhaust AHUs electric power consumption [kW]	0	
Total supply Air Flow Rate [m^3/h]	100 000	
Total exhaust Air Flow Rate [m^3/h]	0	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	2	0,57
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	88,7	-
Outlet [dB]	90,7	-
Enviroment [dB]	77,3	-

Solution provided by VTS

The cooperation between VTS and the investor's representatives resulted in a delivery of 11 supply AHUs ensuring complete outside air treatment moost of the units are with mixing box.

The required 'silent' operation of zonal AHUs equipped with PLUG fans with direct drive breaks the stereotype concerning the necessity of applying 'forward curved' radial fans in such cases.

The flat construction of the VENTUS AHU's casing was another strong asset for using them as peripheral devicesa suspended under the ceiling.

Shanghai No.1 Hospital

Location: **Shanghai, China**

Area: **1 500 m²**

Cubic measure being handled by VTS units: **3 870 m³**

Building characteristics

Purpose:
The hospital is one of the largest modern medical health centers, which bears the responsibility of medical treatment, teaching, research, healthcare, rehabilitation and guidance to the medical work in the city. The hospital is equipped with hospital beds in order to cope with a daily diagnosis of thousands of various cases.

Area: 1 500 m²

Cubic measure being handled by VTS units:
3 870 m³

The conception of ventilation system

Besides standard ventilation, the system is responsible for providing high purity air to the operating block zones and also for patient preparation rooms. In the examined case, due to special character of carried out surgeries, the air conditioning system has been prepared on the basis of the operation of independent supply and exhaust units without energy recovery. The AHUs prepare air for a number of rooms of the operating block in accordance with their air purity class within the following ranges:

- level 10 000 – indoor temperature: 22-26°C, relative humidity: 30-60%, number of air exchanges: 22 h-1
- level 100 000 - indoor temperature: 22-26°C, relative humidity: 30-60%, number of air exchanges: 13 h-1.

The requirement concerning full asepsis of the operating block's zones resulted in the installation of absolute filters, placed before supply grills. Independent steam humidifiers were installed inside air handling units. With reference to the elements of air handling units and especially those intended for outside installation the designer introduced special requirements concerning casing's resistance to weather conditions, highly airtight casings, smooth internal surfaces and application of inside lighting and inspection 'windows' in service AHU sections.

Project AHUs functions

General characteristic of devices		
Number of AHUs	26	
Configuration	Preliminary Filter, Secondary Filter, Double Cooler, Final Filter / Filter Fan	
Operational parameters		
Total AHUs cooling capacity [kW]	762	
Total supply AHUs electric power consumption [kW]	75	
Total exhaust AHUs electric power consumption [kW]	30	
Total supply Air Flow Rate [m³/h]	86 724	
Total exhaust Air Flow Rate [m³/h]	55 473	
Average SFP [kW/m³/s]/[W/m³/h]	4,35	1,21
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	68	82
Outlet [dB]	80	87
Enviroment [dB]	52	58

Solution provided by VTS

VTS' participation in the process of realization of this huge investment included a delivery of 10 CV-A (90 000m³/h) supply AHUs as well as 16 CV-A/CV-P (55 500m³/h) exhaust ones. Along with the required solutions concerning the quality of the devices the AHUs have also been equipped with PLUG fans with direct drive that promote the system's aspects of hygiene.

Above all lack of the fan's 'perpetual screw' casing enables easy cleaning of the rotor and the elimination of belt transmission contributes to lengthening the life of the last of the F9 secondary filtration stages applied inside air conditioning units.

Trade house ADEM

Location: **Almaty, Kazakhstan**

Cubic measure being handled by VTS units: **348 000 m³**

Building characteristics

Purpose:
One of the largest supermarkets in Almaty

Cubic measure being handled by VTS units:
348 000 m³

The conception of ventilation system

Primordial concept of this building was to collect the best trade marks all over the world and make all necessary condition for customer to make their buying process like a good rest. Of course one of the most important requisite conditions was comfort air conditioning. Weather condition during the period of hot summer and cold winter create another criterions for ventilation system.

Depending on cubic capacity of building the installation's designer applied duct system with equal air supply to hole facility.

Project AHUs functions

General characteristic of devices		
Number of AHUs	19	
Configuration	Bag Filter, Cooler, Heater, Fan, Filter, Silencer	
Operational parameters		
Total AHUs cooling capacity [kW]	1 758	
Total AHUs heating capacity [kW]	4 559	
Total supply AHUs electric power consumption [kW]	207	
Total exhaust AHUs electric power consumption [kW]	0	
Total supply Air Flow Rate [m^3/h]	348 000	
Total exhaust Air Flow Rate [m^3/h]	0	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	2,08	0,58
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	85	0
Outlet [dB]	89	0
Enviroment [dB]	75,6	0

Solution provided by VTS

The cooperation between VTS and the investor's representatives resulted in a delivery of 19 supply AHUs with cooling and heating possibility ensuring complete outside air treatment.

Toyota Lexus Showroom

Location: **Almaty, Kazakhstan**

Area: **7 800 m²**

Cubic measure being handled by VTS units: **63 500 m³**

Building characteristics

Purpose:
Each of the Toyota car showrooms is designed according to the global standards of Toyota-Motor Corporation.

The building consists of an exhibition and a shop part, a car service together with a car wash and rest and refreshment facilities as well as a 'recreation' zone for waiting Clients.

Area: 7 800 m²

Cubic measure being handled by VTS units:
63 500 m³

The conception of ventilation system

According to the guidelines the design of the ventilation system was prepared in the scope of supplying indispensable amount of air with the parameters ensuring required temperature inside rooms for the staff and car showroom's clients within a whole year.

The character of operation of individual zones of the building (air temp. 16÷28°C) imposed a division into local systems on the designer. As a result the resistances of the ventilation system were reduced (lower electric energy consumption) and there are no phenomena of 'under-' or 'overheating' in the building. For the biggest exhibition space due to possibly high differences of heat load additional ceiling 'split' type air conditioners individually adjusting the air temperature in a room in their operation range were used. In spite of the fact that there were 3 technical rooms in the building some of the AHUs (of the capacity of 1400m³/h) were planned to be installed directly inside ventilation ducts over a suspended ceiling. Such a fragmented structure of sub-systems unconditionally required preparing appropriate control systems equipped with time systems enabling cyclical operation of individual installations.

Project AHUs functions

General characteristic of devices		
Number of AHUs	18	
Configuration	Filter, Cooler, Fan, Silencer	
Operational parameters		
Total AHUs cooling capacity [kW]	81	
Total AHUs heating capacity [kW]	1 678	
Total supply AHUs electric power consumption [kW]	30	
Total exhaust AHUs electric power consumption [kW]	7	
Total supply Air Flow Rate [m³/h]	91 130	
Total exhaust Air Flow Rate [m³/h]	23 760	
Average SFP [kW/m³/s]/[W/m³/h]	1,48	0,41
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	88	66
Outlet [dB]	77	84
Enviroment [dB]	78	70

Solution provided by VTS

In consequence of the principles of the design 18 VENTUS AHUs of the capacity of 1400÷18200m³/h and divided properly into supply and exhaust systems were delivered. In the case of the biggest air flows the units are responsible for heating and cooling air in the sales area. The remaining units for the service part and the car wash realize an appropriate air exchange and heat the air.

In case of simultaneous operation of all AHUs due to a right decision of the designer concerning decentralization of the system and the application of low air flow velocities the system is distinguished by very low energy consumption. In addition high efficiency of the system and its optimal use are secured by the VTS control automatics system.

Polish Security Printing Works

Location: **Warsaw, Poland**

Building characteristics

Purpose:
The Polish Security Printing Works is a modern industrial object that specialises in producing well-protected securities and documents. At present, the company is the only Polish producer of banknotes.

The company owns in-house laboratories and a design office, which enables it to constantly improve the quality of the produced documents and their security features. The maim client of PSPW are the governmental and financial institutions as well as great corporations and smaller enterprises.

The conception of ventilation system

The creation of the ventilation system for an industrial object that that specialises in printing presented a challenge to the devices we used; it was essential that the devices maintain proper thermal and humidity parameters of the production rooms and their operation remain reliable and unfailing.

It is worth noticing that the proper behaviour of the paper sheets during printing requires the preservation of relevant level of their humidity, also when they are stored before printing.

Therefore, the ventilation system in particular rooms was equipped with expanded systems for air humidifying that are controlled on the basis of the measured air humidity in the production zones.

Project AHUs functions

General characteristic of devices		
Number of AHUs	10	
Configuration	rotary exchanger, heating, cooling	
Operational parameters		
Total AHUs heating capacity [kW]	374	
Total supply AHUs electric power consumption [kW]	25,301	
Total exhaust AHUs electric power consumption [kW]	19,685	
Total supply Air Flow Rate [m^3/h]	57 225	
Total exhaust Air Flow Rate [m^3/h]	51 650	
Average SFP [$kW/m^3/s$]/[$W/m^3/h$]	0,98	3,54
Noise parameters for loudest units at 250Hz		
	Supply	**Exhaust**
Inlet [dB]	77,5	79,7
Outlet [dB]	89	87,4
Enviroment [dB]	63,4	61,7

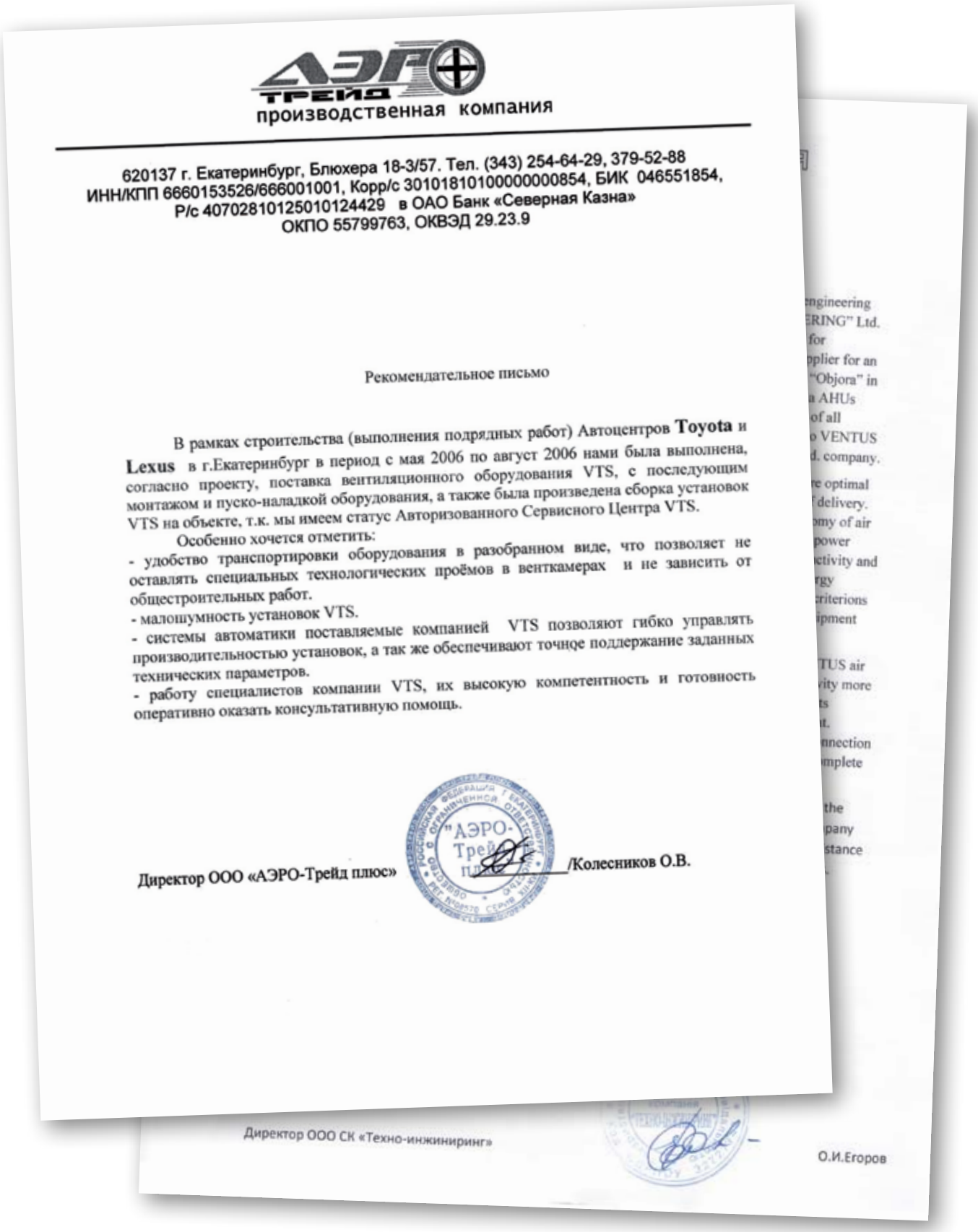
Solution provided by VTS

The initial project of the ventilation system in PSPW was created in 2002. We intended to install the air handling units of CV type that were then manufactured by VTS. In the second half of 2005, we extended our offer with a new VENTUS product line; consequently the project had to undergo considerable changes.

The investor's trust in the reliability of VTS resulted in further participation of VTS company in this project, which in turn forced us to update the project of the system. We had to take into consideration while preparing the new project both the changes in the construction and dimensions of VENTUS AHUs, and the specificity of their operation and their use of the energy carriers.

After a few recalculations, we proposed devices that allow for achieving significant economies in the exploitation costs, mainly due to lower velocities of the air flow that were applied in the new product line. Finally, 10 ventilation units were used that performed the heating and cooling functions and that were equipped with the energy recovery system based on the circular exchangers. In minor ventilation subsystems, we used the suspended VS 15 units, easy to assemble, with the air heating function.

Certificates



производственная компания

620137 г. Екатеринбург, Блюхера 18-3/57. Тел. (343) 254-64-29, 379-52-88
ИНН/КПП 6660153526/666001001, Корр/с 30101810100000000854, БИК 046551854,
Р/с 40702810125010124429 в ОАО Банк «Северная Казна»
ОКПО 55799763, ОКВЭД 29.23.9

Рекомендательное письмо

В рамках строительства (выполнения подрядных работ) Автоцентров **Toyota** и **Lexus** в г.Екатеринбург в период с мая 2006 по август 2006 нами была выполнена, согласно проекту, поставка вентиляционного оборудования VTS, с последующим монтажом и пуско-наладкой оборудования, а также была произведена сборка установок VTS на объекте, т.к. мы имеем статус Авторизованного Сервисного Центра VTS.

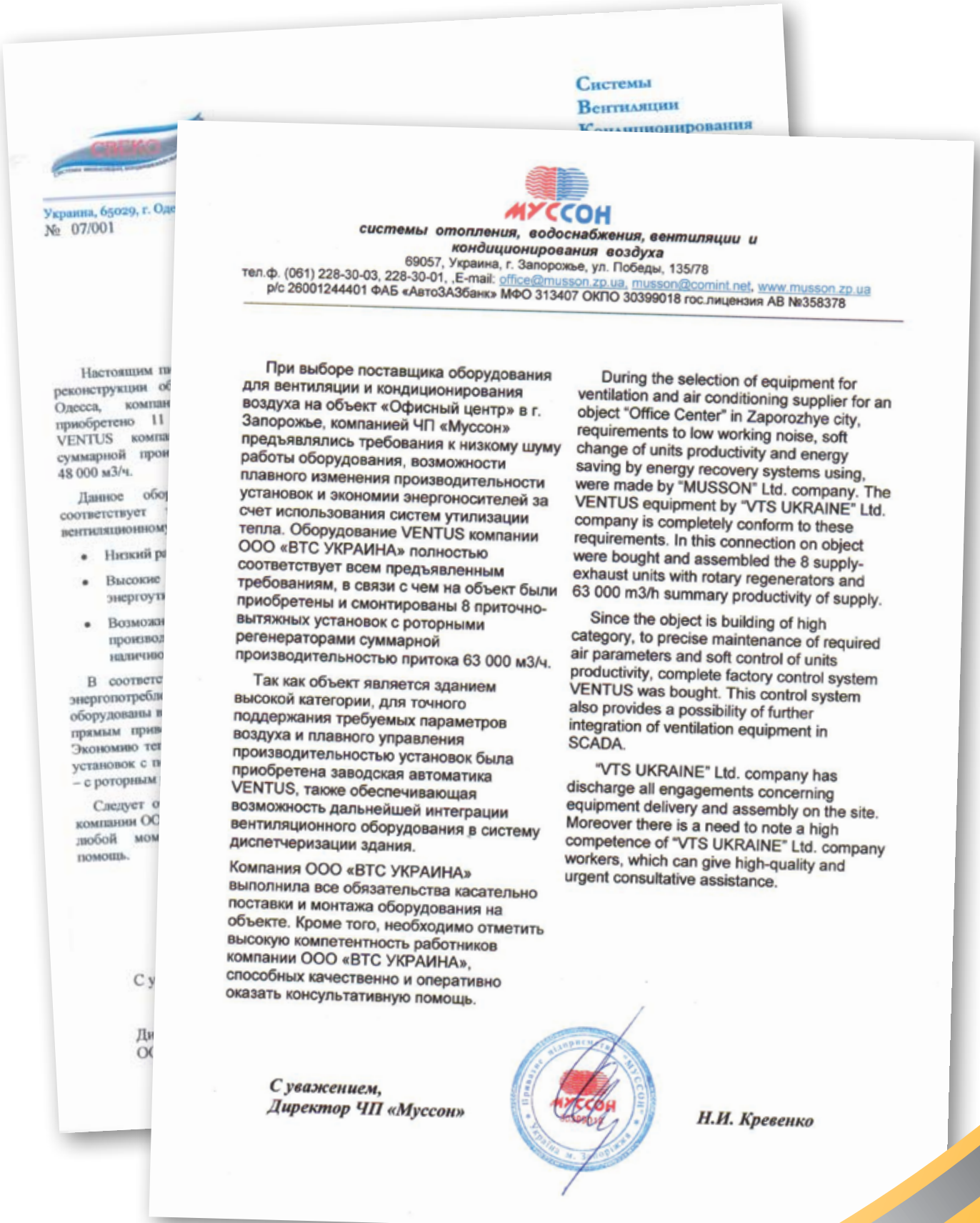
Особенно хочется отметить:

- удобство транспортировки оборудования в разобранном виде, что позволяет не оставлять специальных технологических проёмов в венткамерах и не зависить от общестроительных работ.
- малошумность установок VTS.
- системы автоматики поставляемые компанией VTS позволяют гибко управлять производительностью установок, а так же обеспечивают точное поддержание заданных технических параметров.
- работу специалистов компании VTS, их высокую компетентность и готовность оперативно оказать консультативную помощь.

Директор ООО «АЭРО-Трейд плюс» /Колесников О.В.

engineering
ERING" Ltd.
for
pplier for an
"Objora" in
AHUs
of all
VENTUS
d. company.
e optimal
delivery.
my of air
power
ctivity and
rgy
riterions
ipment
TUS air
vity more
ts
t.
nnection
mplete
the
pany
stance

Директор ООО СК «Техно-инжиниринг» О.И.Егоров



Системы
Вентиляции
Кондиционирования

Украина, 65029, г. Оде
№ 07/001

Настоящим п
реконструкции об
Одесса, компан
приобретено 11
VENTUS компа
суммарной прои
48 000 м3/ч.

Данное обор
соответствует
вентиляционному

- Низкий ур
- Высокие
энергоут
- Возможн
производ
наличию

В соответст
энергопотребл
оборудованы в
прямым приво
Экономию тен
установок с п
– с роторным

Следует о
компании ОО
любой мом
помощь.

С у

Ди
ОО

МУССОН

системы отопления, водоснабжения, вентиляции и кондиционирования воздуха

69057, Украина, г. Запорожье, ул. Победы, 135/78
тел.ф. (061) 228-30-03, 228-30-01, ,E-mail: office@musson.zp.ua, musson@comint.net, www.musson.zp.ua
р/с 26001244401 ФАБ «АвтоЗАЗбанк» МФО 313407 ОКПО 30399018 гос.лицензия АВ №358378

При выборе поставщика оборудования для вентиляции и кондиционирования воздуха на объект «Офисный центр» в г. Запорожье, компанией ЧП «Муссон» предъявлялись требования к низкому шуму работы оборудования, возможности плавного изменения производительности установок и экономии энергоносителей за счет использования систем утилизации тепла. Оборудование VENTUS компании ООО «ВТС УКРАИНА» полностью соответствует всем предъявленным требованиям, в связи с чем на объект были приобретены и смонтированы 8 приточно-вытяжных установок с роторными регенераторами суммарной производительностью притока 63 000 м3/ч.

Так как объект является зданием высокой категории, для точного поддержания требуемых параметров воздуха и плавного управления производительностью установок была приобретена заводская автоматика VENTUS, также обеспечивающая возможность дальнейшей интеграции вентиляционного оборудования в систему диспетчеризации здания.

Компания ООО «ВТС УКРАИНА» выполнила все обязательства касательно поставки и монтажа оборудования на объекте. Кроме того, необходимо отметить высокую компетентность работников компании ООО «ВТС УКРАИНА», способных качественно и оперативно оказать консультативную помощь.

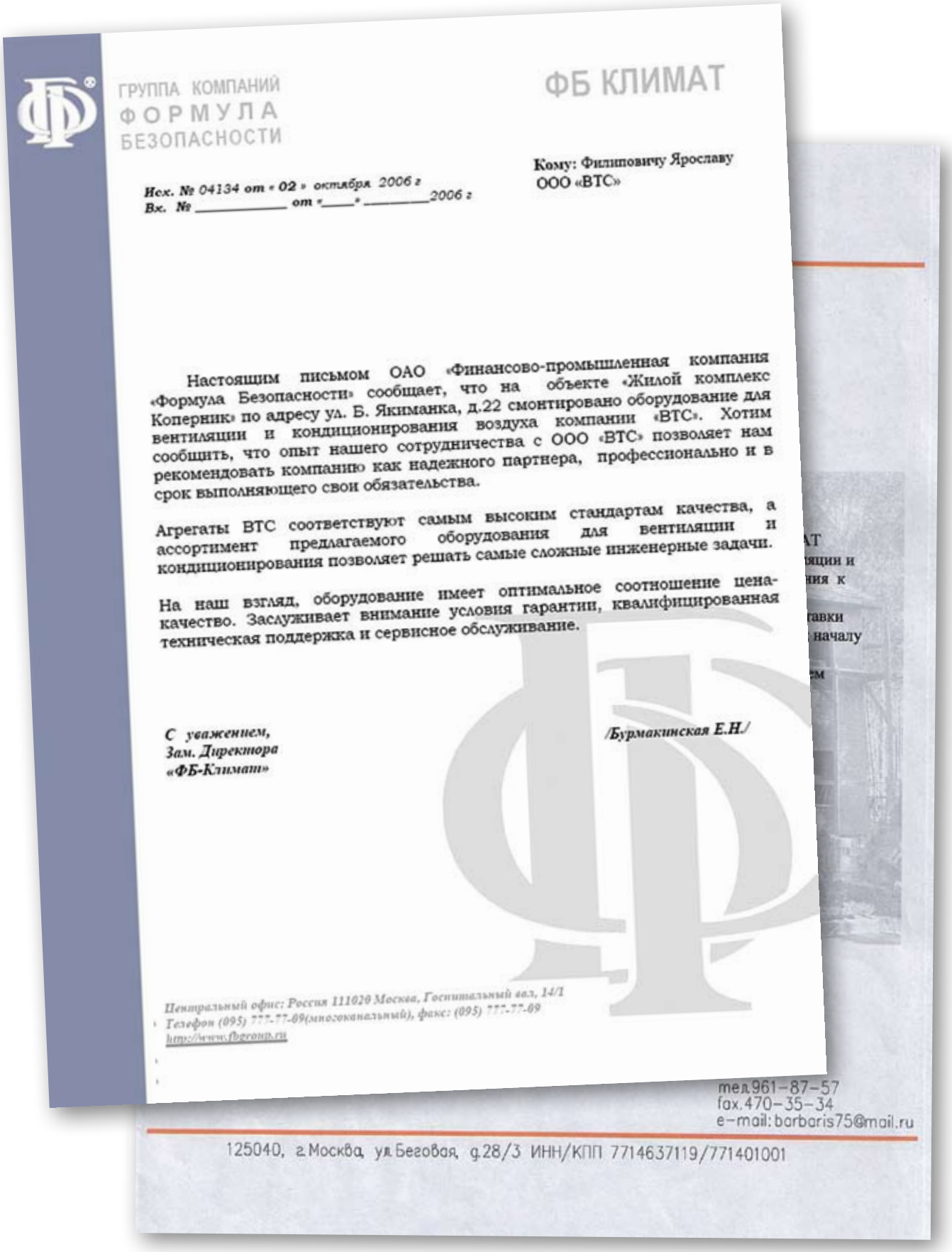
During the selection of equipment for ventilation and air conditioning supplier for an object "Office Center" in Zaporozhye city, requirements to low working noise, soft change of units productivity and energy saving by energy recovery systems using, were made by "MUSSON" Ltd. company. The VENTUS equipment by "VTS UKRAINE" Ltd. company is completely conform to these requirements. In this connection on object were bought and assembled the 8 supply-exhaust units with rotary regenerators and 63 000 m3/h summary productivity of supply.

Since the object is building of high category, to precise maintenance of required air parameters and soft control of units productivity, complete factory control system VENTUS was bought. This control system also provides a possibility of further integration of ventilation equipment in SCADA.

"VTS UKRAINE" Ltd. company has discharge all engagements concerning equipment delivery and assembly on the site. Moreover there is a need to note a high competence of "VTS UKRAINE" Ltd. company workers, which can give high-quality and urgent consultative assistance.

С уважением,
Директор ЧП «Муссон»

Н.И. Кревенко



ГРУППА КОМПАНИЙ
ФОРМУЛА
БЕЗОПАСНОСТИ

ФБ КЛИМАТ

Исх. № 04134 от «02» октября 2006 г
Вх. № _____ от «____» _____2006 г

Кому: Филиповичу Ярославу
ООО «ВТС»

Настоящим письмом ОАО «Финансово-промышленная компания «Формула Безопасности» сообщает, что на объекте «Жилой комплекс Коперник» по адресу ул. Б. Якиманка, д.22 смонтировано оборудование для вентиляции и кондиционирования воздуха компании «ВТС». Хотим сообщить, что опыт нашего сотрудничества с ООО «ВТС» позволяет нам рекомендовать компанию как надежного партнера, профессионально и в срок выполняющего свои обязательства.

Агрегаты ВТС соответствуют самым высоким стандартам качества, а ассортимент предлагаемого оборудования для вентиляции и кондиционирования позволяет решать самые сложные инженерные задачи.

На наш взгляд, оборудование имеет оптимальное соотношение цена-качество. Заслуживает внимание условия гарантии, квалифицированная техническая поддержка и сервисное обслуживание.

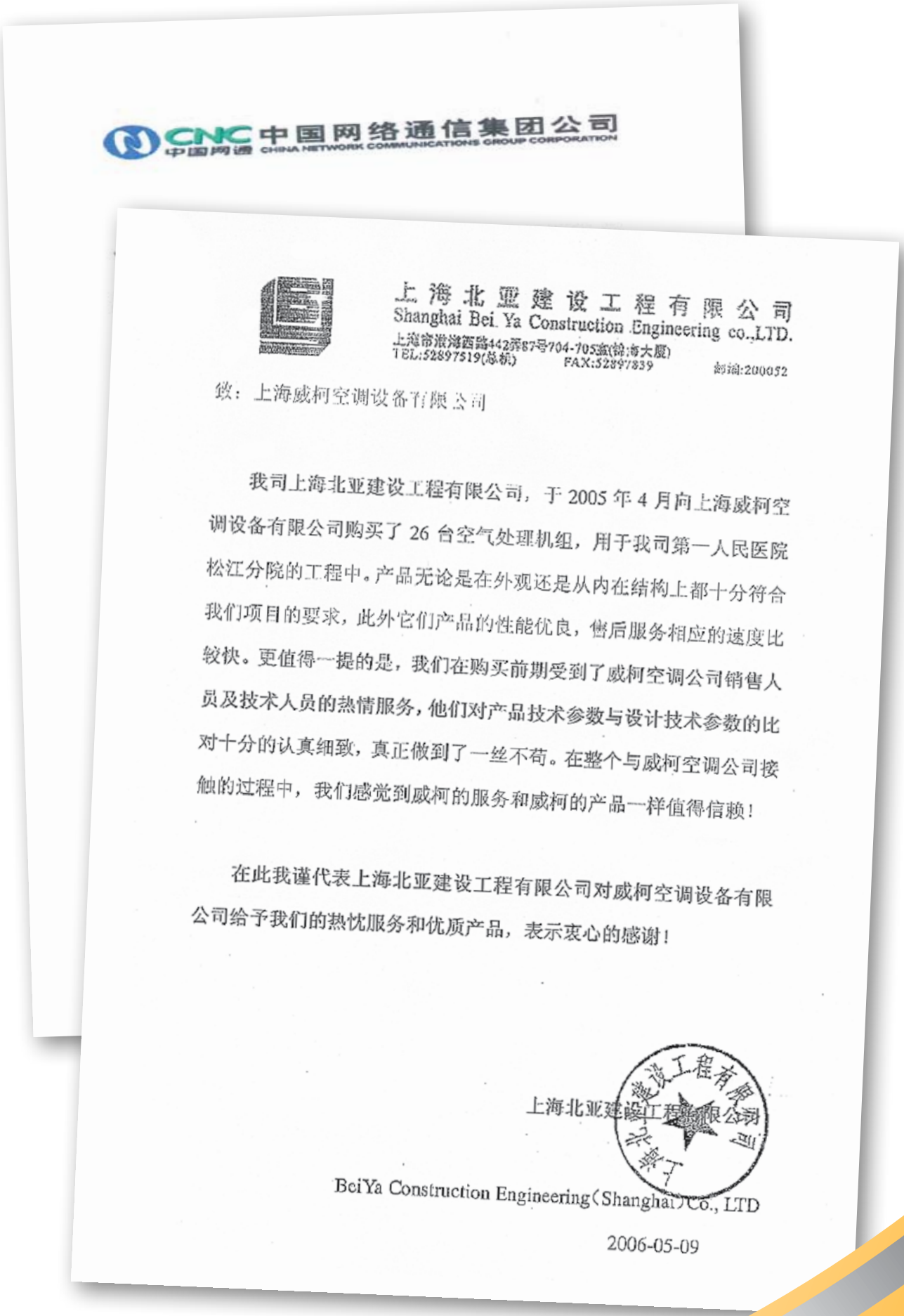
С уважением,
Зам. Директора
«ФБ-Климат»

/Бурмакинская Е.Н./

Центральный офис: Россия 111020 Москва, Госпитальный вал, 14/1
*Телефон (095) ***-**-09(многоканальный), факс: (095) ***-**-09*
http://www.fbgroup.ru

мел.961-87-57
fax.470-35-34
e-mail: barbaris75@mail.ru

125040, г.Москва, ул.Беговая, д.28/3 ИНН/КПП 7714637119/771401001



中国网络通信集团公司
CNC 中国网通 CHINA NETWORK COMMUNICATIONS GROUP CORPORATION

上海北亚建设工程有限公司
Shanghai Bei Ya Construction Engineering co.,LTD.
上海市淮海西路442弄87号704-705室(铭海大厦)
TEL:52897519(总机) FAX:52897839 邮编:200052

致：上海威柯空调设备有限公司

我司上海北亚建设工程有限公司，于 2005 年 4 月向上海威柯空调设备有限公司购买了 26 台空气处理机组，用于我司第一人民医院松江分院的工程中。产品无论是在外观还是从内在结构上都十分符合我们项目的要求，此外它们产品的性能优良，售后服务相应的速度比较快。更值得一提的是，我们在购买前期受到了威柯空调公司销售人员及技术人员的热情服务，他们对产品技术参数与设计技术参数的比对十分的认真细致，真正做到了一丝不苟。在整个与威柯空调公司接触的过程中，我们感觉到威柯的服务和威柯的产品一样值得信赖！

在此我谨代表上海北亚建设工程有限公司对威柯空调设备有限公司给予我们的热忱服务和优质产品，表示衷心的感谢！

上海北亚建设工程有限公司

BeiYa Construction Engineering(Shanghai)Co., LTD

2006-05-09

VTS worldwide

VTS HQ Sp. z o.o.:
ul. Szkolna 24, Suchy Dwór
81-198 Kosakowo, Poland
tel. + 48 58 628 13 54
fax + 48 58 628 13 22
vtsgroup@vtsgroup.com

www.vtsgroup.com