

**A clean/r & healthy business**



Here at Disan we have  
developed a trouble-free  
way for you  
*to benefit from a central  
vacuum*

**Central vacuum installations** make good sense: they are an excellent way to supplement your business getting **innovative and healthier cleaning solutions** for all kinds of buildings.

Our goal is to provide you with a complete "turnkey" solution – no headaches, no confusion – only what you need to get a job done. When we claim that we are creating "turnkey" commercial solutions we mean to say that we will supply all of the equipment and design support that you need to effectively approach **any type of central vacuum project.**

We have engineered a line of equipment designed specifically for commercial central vacuum systems that we offer with **confidence and pride.**

We have successfully participated on prestigious commercial projects in over **40 countries around the world.**

The **owners and facility managers** where there is a central vacuum already installed are the ones who promote our products with **most satisfaction and profit.**

We are **world leaders** in commercial central vacuum systems, helping you benefit not only from our service-oriented business model but also from the **Disan reputation for quality.**



No matter what  
type of application,  
we can provide  
the correct  
technical solution  
for every building

### Range of Applications

Disan commercial vacuum equipments have been used in a **wide variety of applications** including hotels, offices, schools, banks, theatres, churches, hospitals, retirement homes, cars' stations, yachts, sport complexes and high-end villas.

Essentially any environment that requires thorough, quick, and frequent cleaning can benefit from the professional cleaning power, **efficiency, and reliability** of a commercial central vacuum system which is virtually maintenance free.

We do not simply supply products – **we sell solutions**. No matter how unique the project we can help you specify the appropriate equipment, piping system and accessories.

### Here is only a small part of our reference list, with a single object for each country:

Armenia	Russia Hotel	Tsakhkadzor	Korea	Agricultural Rural Corporation	Seoul
Australia	Bendigo Bank	Melbourne	Lithuania	National Opera Theatre	Vilnius
Austria	Trofana Royal Hotel	Ischgl	Malaysia	IMAX Movie Theatre	Kuala Lumpur
Bahrain	Mannal Towers	Manama	Montenegro	Hotel Queen of Montenegro	Bečići
Belarus	State Museum of Art	Minsk	Netherlands	University of Technology TU/e	Eindhoven
Belgium	Danone	Rotselaar	Oman	Arabi Holding Group Building	Muscat
Bosnia	Croatia Osiguranje Building	Ljubuski	Philippines	Dexterton Corporation	Quezon City
Brazil	Cambuci Convention Hotel	Bahia	Poland	Centrum Sportowo-Biznesowego	Elbląg
Bulgaria	Hotel Odisei SPA	Chiflik	Portugal	Royal Garden Hotel	Ponta Delgada
Canada	House of Commons-printshop	Ottawa	Russia	International House of Music	Moscow
China	Hotel Chang Fu Gong	Beijing	Serbia	Control tower at Tesla Airport	Belgrade
Croatia	Hotel Tamaris	Tučepi	Singapore	Changi Village	Singapore
Cyprus	Merit Hotel	Lefkosia	Slovakia	Smurfit Kappa plants	Štúrovo
Czech Rep.	Carlsbad Plaza Hotel	Karlovy Vary	Slovenia	Municipal Senior home	Ptuj
Egypt	Pyramid Hills Village	El-Giza	Spain	Hotel Resort Princesa Yaiza	Lanzarote
Estonia	Baptist Church Betaania	Mustvee	Switzerland	Roche Forum	Buenos
France	Hôtel Le Club 1850	Courchevel	Taiwan	Chi Yi Plant	Nan Ya
Germany	BMW Welt	Munich	Turkey	By-o-tell	Istanbul
Greece	Hotel Armonia	Vouliagmeni	UAE	Ismaili Centre Dubai	Dubai
Iran	Morvarid Khalij (Dolphin) hotel	Kish Island	UK	Gospel Hall	Guildford
Ireland	Herbert Park Hotel	Dublin	Ukraine	Beskid Center	Kiev
Italy	Grand Hotel Savoia	Cortina	USA	Bank of America	Seattle



## Disan products' range deliver the ideal cleaning solutions *when indoor environmental quality and energy efficiency are top priorities.*

As a proud member of the **Casa-Clima / Klima Haus** association, which is the leading organisation in Italy for the sustainable energy building and member of the **Sustainable Energy Europe**, we are committed to ensuring that all our products are environmentally responsible and will contribute to sustainable building practices.

Disan's commercial central vacuums are an environmentally and socially responsible alternative to traditional cleaning systems and can contribute to **a healthy and prosperous indoor environment.**

The Leadership in Energy and Environmental Design Green Building Rating System™ is an internationally accepted standard for green building design, construction, and operation. The **LEED rating systems** take into account five primary categories when evaluating buildings for environmental impact: site planning, water management, energy efficiency, material use, and indoor environmental quality.

A **Disan central vacuum system** can help contribute to LEED certification by offering a **number of distinct advantages** over traditional portable vacuum cleaners.



## Building green: an opportunity for central vacuums to achieve their deserved position in the modern building

### How to achieve energy savings?

Although the power consumption of both the average portable vacuum and a central unit is around 1200 watts for each user, savings can be achieved as follows:

- 1) with a central vacuum cleaner you will have to **vacuum less often**: Since dust and dirt are captured in the central power unit located in a machinery room in the basement, none blows through the filter and back into the living rooms.
- 2) most central vacuums have two to **three times the cleaning power** of portable vacuums. This deep down cleaning accompanied with the versatility to reach areas more quickly actually reduces operating time to clean the room.
- 3) the central vacuum **evacuates all germ-laden** air and dust from the room, unlike the portable vacuum which is forced to redeposit the exhausted dust and germ laden air back into the same room. . You can see this in a ray of sunlight or in the accumulated dust that settles on the drapery or furniture. This requires additional cleaning time and more electrical energy consumption.

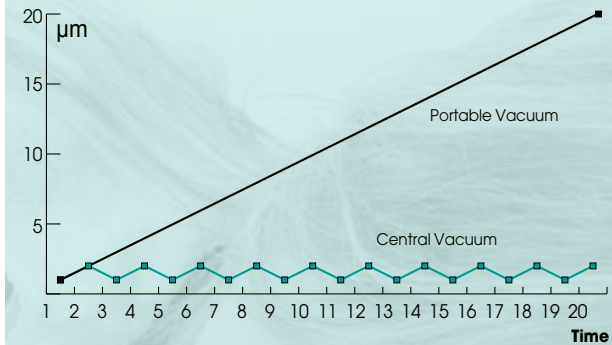
4) central vacuum motors are far **more efficient**. Where a typical motor in a portable vacuum has an efficiency rating of 30%, the hard-industrial induction motors are now achieving up to 50% and working toward a target of 70% when coupled with an electronic frequency converter.

Central vacuums **clearly have a major advantage** when it comes to the health aspect of the building green, as indoor air pollution is one of the top environmental health risks identified by the sanitarian. One of the major means of reducing chronic illnesses is to keep the house clean.

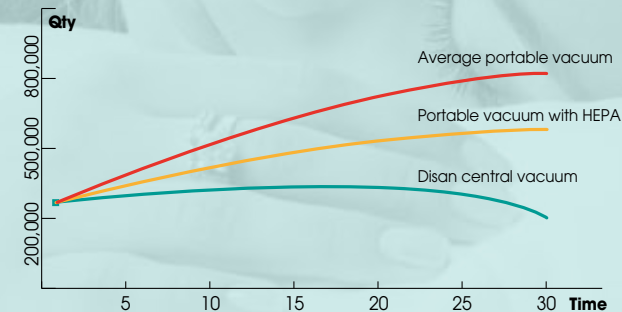
House dust mites, pollens, animal dander, and other allergy-causing agents can be strongly reduced through regular central vacuum cleaning.

In 2002 the **Division of Allergy and Immunology** at the University of California, Davis, conducted a clinical study that proved a link between central vacuum systems and allergy relief. The study found that patients experienced a 40% to 61% improvement in their symptoms when they switch from using a portable vacuum to a built-in central vacuum system!

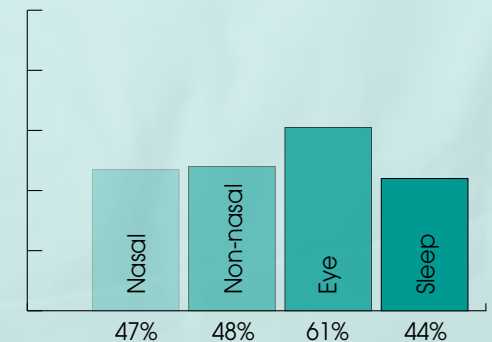
Fine particles inside the building in the middle run



Harmful dust particles (< 0.5µm) per litre of air in a room during the vacuum cleaning process



Percent Improvement in symptoms and allergy relief with central vacuum (University of California 2002)







## An economic *choise*

The real benefits of a CVS in commercial property are in the cost-savings they provide: the **improvements in “building” hygiene, shorter cleaning times, and the ability to amortize the system** over the life of the building.

### Facility Management

They will tell you that the total costs of cleaning a commercial building are 90% labour and 10% for all supplies, tools and equipment. Therefore, if one is to really try to lower the total cost of cleaning, you must attack the labour cost. To do so, you need to make the labour force more productive. **There is no better way than to give workers the correct equipment and tools.**

### Hygiene

Our **health is a priceless** commodity that depends, in large measure, on the health of the buildings in which we live, sleep and work. Improve staff productivity by cutting down on allergy related sickness.

### Cleaning time

The savings gained from cleaning efficiencies and staff, more than justifies the investment in

with conventional vacuum systems



with a central vacuum



total cost saving



### ECONOMIC BENEFITS OF CENTRAL VACUUM SYSTEMS

In our long experience and after several case studies, we can demonstrate that the savings gained from cleaning efficiencies and staff more than justifies the investment in equipment.

### YOU CAN REDUCE UP TO 38% OF YOUR OPERATING COST?

Deep cleaning of 30 rooms in only one hour: What do you need?

Thanks to the improved efficiency of the CVS, 38 % less time (or 38% less people) is needed to get the same result.

**Cleaning with a whisper... a real investment !!!**



equipment. How can you reduce up to 38% of your operating costs?

- **Greater efficiency.** By eliminating the “down times” - no plugging and unplugging of power cords, cables and accessories. Simply plug the hose into an inlet, and with our handy cleaning trolley, you’re ready to begin vacuuming.
- **Powerful.** Central vacuums are 4 times more powerful than conventional methods. Just a single pass of a central vacuum removes the same quantity of dirt and debris as 2-3 passes using a traditional cleaner.
- **Maintenance.** Central vacuums are virtually maintenance free, just empty the large bin once or twice a year.
- **Tools.** The wider and special tools available for central vacuums make it easy to find the right tool for the job.
- **Silent.** Central

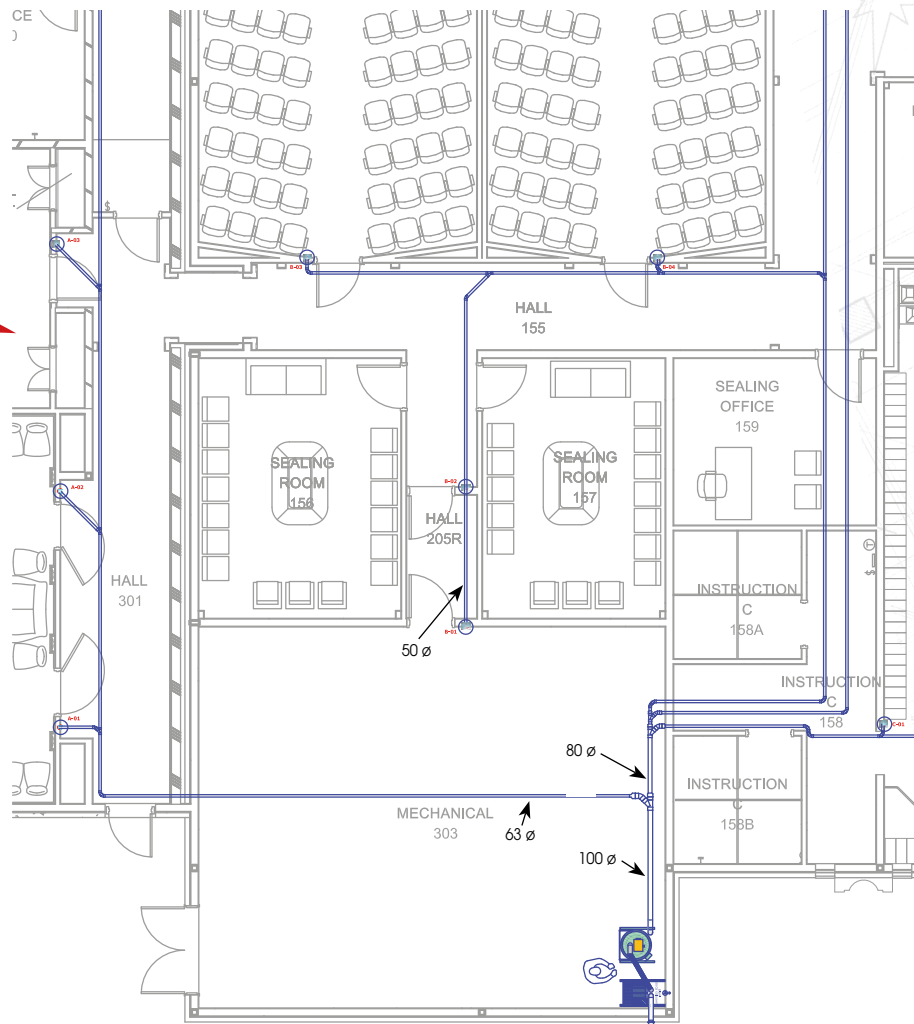
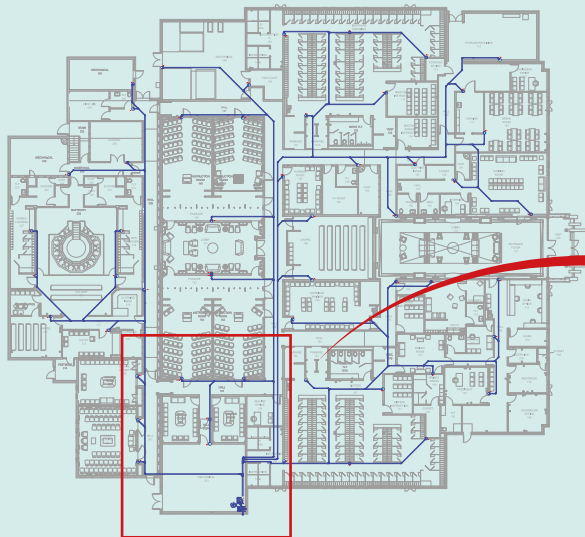
vacuums are quiet, cleaning can take place without disturbing clientele, without interruption of schedules even during working hours—they won’t know you’re even there!

#### System amortization

As with all commercial systems, Disan’s three-phase turbine engines are ruggedly built, designed for industrial applications with durability and reliability in mind, and manufactured to withstand the stress of operating all day, everyday. **Central vacuums are practically maintenance free**, always efficient and increases the building’s worth, re-paying itself in just a few years.

#### FACTS

- Keeps your building healthy by maintaining the indoor air quality.
- Improves staff productivity by cutting down on allergy related sickness.
- Allows the cleaning process to be checked and monitored by the Building Management System\*.
- Allows for cleaning to be done any time of day only with a whisper.
- Carpets get cleaned down to deeper levels with the high airflow.
- Add prestige and style to your building.



## piping network *installation support*

Because most commercial central vacuum applications will require multiple simultaneous operators you will have to specify piping networks that can support the demands of these systems.

The **diameter of piping** you need **depends on the number of simultaneous operators** and is especially important in optimizing the airflow characteristics of these commercial systems.

We offer to completely design the pipe layout and specify the appropriate materials needed for the job. Since the **piping network is a fundamental part of the central vacuum system**, we consider it our responsibility to help you deliver a complete solution to meet specific building codes and application requirements.





## Disan *all range* ...

Since 1991 Disan has been involved exclusively in the development, production and trading of Central Vacuum Systems and connected components for **domestic, commercial and light industrial applications**.

The Disan range provides cleaning solutions for all kind of buildings and purposes:



## The power *units*

Drawing on years of experience designing commercial central vacuum systems, we have engineered a line of equipment that is unmatched. These products are more reliable, easier to use, and more energy efficient than anything available on the market.

**A SIEMENS** induction turbines have neither parts in connection nor transmissions. The motors involved are three-phase induction with side-channel blowing engine. The average rotation speed is 2,850 rpm (revolutions per minute), in contrast to 20,000+ rpm of traditional single-phase motors. This difference means that there is much lower stress for the shafts and bearings. The motor is powered by induction: there are no carbon brushes, sparks, or other components in friction. These motors do not need maintenance, they were developed for professional use and they are routinely used by industries for continuous duty (24 hours, every day) with reliable characteristics. These motors cannot be compared with a traditional vacuum system as they are the highest technology on the market.

**B STAR FILTER** made of special polyester cloth with high withholding properties is one of the most highly appreciated components of the system. All the industrial vacuum units use this type of filter. It combines a high withholding of micro-dust with easy-cleaning. Cleaning can be accomplished by shaking or machine washing. Different filter media are available to meet specific filtration requirements. The optional and







recommended self-cleaning system always maintains the maximum efficiency. This system automatically cleans the filter at pre-programmed intervals (typically once per day).

**C CONNECTION ELEMENTS** and mounting elements are always included. Our central units are always delivered complete and ready to be installed without the necessity to buy collectors, couplings, or other installation materials. The great advantage of central units with electronic controls is that they are always ready simply by connecting the plug at the current network. All the connection couplings at the solid piping line are anti-vibration and adjustable.

**D OPEN FRAME** steel motor mounts are for maximum dissipation of heat. The opened frame does not imply a higher sound level as 90% of the sound is from the exhaust (discharge). The system is provided with a exhaust silencer to minimize sound level. The largest advantage of the open frame is the increase in thermal dissipation, the increase in performance efficiency, and cancellation of the risk of motor fusion.

**E** Since 1997 Disan introduced for the first time **motors with electronic frequency control** coupled with a digital depression meter to maintain a constant value of dynamic vacuum. The motor can automatically adapt the power (and the consumption) according to the number of simultaneous operators and the filtering surface efficiency. An electronic transducer for vacuum measurement located in the central unit maintains the optimal operative vacuum

level (Default 140mbar). When the vacuum is too high the system lowers the motor rpm and as a result the power consumption is reduced. When the vacuum is too low the system increases the motor rpm and increases the vacuum level and airflow. Electromagnetic shielding type B (for private applications) and is provided with certificate to avoid electromagnetic interference issues. The prime advantage of the inverter is an economical way to proportion electric power consumption to the ever changing system needs.

**F DUST CONTAINER** with cushioned fasteners for an airtight and easy closure. High capacity dust container usually only needs to be emptied out once or twice a year. The collection and elimination of the dust can be done without any contact. A compensation pressure feature at the dust container is also available to eliminate the need for bag stretchers or other annoying parts.

**The Compact range combines the advantages of commercial design and technology in adding a new dimension to the domestic sector. In a limited space all the advantages of a professional system are included: the reliability of the induction motors, self-cleaning filtration system, electronic motor controls, economic power consumption. Frontal control panel and incorporated inlet valve are very handy for control and for cleaning the area where the motor is installed.**



## Inlet valves

We know that inlet valves are the only component of a central vacuum always in sight and they need to **match with the interior design, furniture and style of the building**. For this reason we look after trends and settings from the electric industries, paying close attention to shape and colours. After all, as an Italian manufacturer, we have always paid close attention to this aspect of design.

These excellent designs do not exclude that we have another top-priority: **Durability, reliability, and safety** are all major concerns in commercial environments. Because commercial central vacuum equipment is designed to handle frequent use you should consider how well other system elements, like inlet valves, will hold up to these same challenges.

Many advantages are demonstrated in our valve designs. For example, in this small part from the larger back side we have developed a feature for easy cabling, reduced deepness for thin walls, wider technical curve to reduce air loss, tight testing caps, etc.

Ending the concrete installation with a Disan back-up box is the best guarantee that a state-of-the-art installation will be realized and that very likely the job will be fulfilled with Disan inlets, central units and accessories.

Certain applications might warrant metal valves, floor valves, or even locking valves.

**We can help you choose the right inlet valves for any situation.**





## THE DISAN *BMS*\*

Disan introduced the **Building Management System**, which is a unique system that controls and stores all data of the central vacuum usage. The system recognizes which inlet is open, when and how much time, and stores the information in the control box, to report to an administrator so that energy expenses can be shared on a usage basis. Constant monitoring of the system with

complete control all the peripheral inlets. **With Disan BMS every inlet socket is equipped with a led**, visible trough the cover, that will flash a red light in case that system is not available, because of reaching max simultaneous users or other service problem. The BMS is strongly recommended for big residential buildings with multi-user central vacuum systems.





## Accessories

Accessories packages are a vital part of delivering a quality central vacuum solution, and no one has more **experience with professional central vacuum accessories** than Disan. We can help you develop a solution for even the most unique application and can help ensure a positive end-user experience with our extensive catalogue of custom parts, together with years of experience in delivering engineered solutions that match the needs of all customers.





Disan offers only the highest quality, most innovative floor care products available on the market. These products have demonstrated the reliability and functionality that is expected in a commercial environment.

**Our comprehensive catalogue of cleaning accessories supported by our engineering, tooling, and manufacturing capabilities permit customer focused solutions**



# Case study I

## Application: 5\* hotel with 214 rooms

No. of floors: 20+3

-3 Service technical floor (Machinery room)

-2,-1 Conference rooms and services

0 Reception

1 Restaurants (3)

2-18 Standard rooms (204)

19 Suites (6)

20 Suites Royales (4)

**No. vacuum inlets 168**

**Central vacuum units 2 x HK175i**

**Simultaneous vacuum operators: 18**

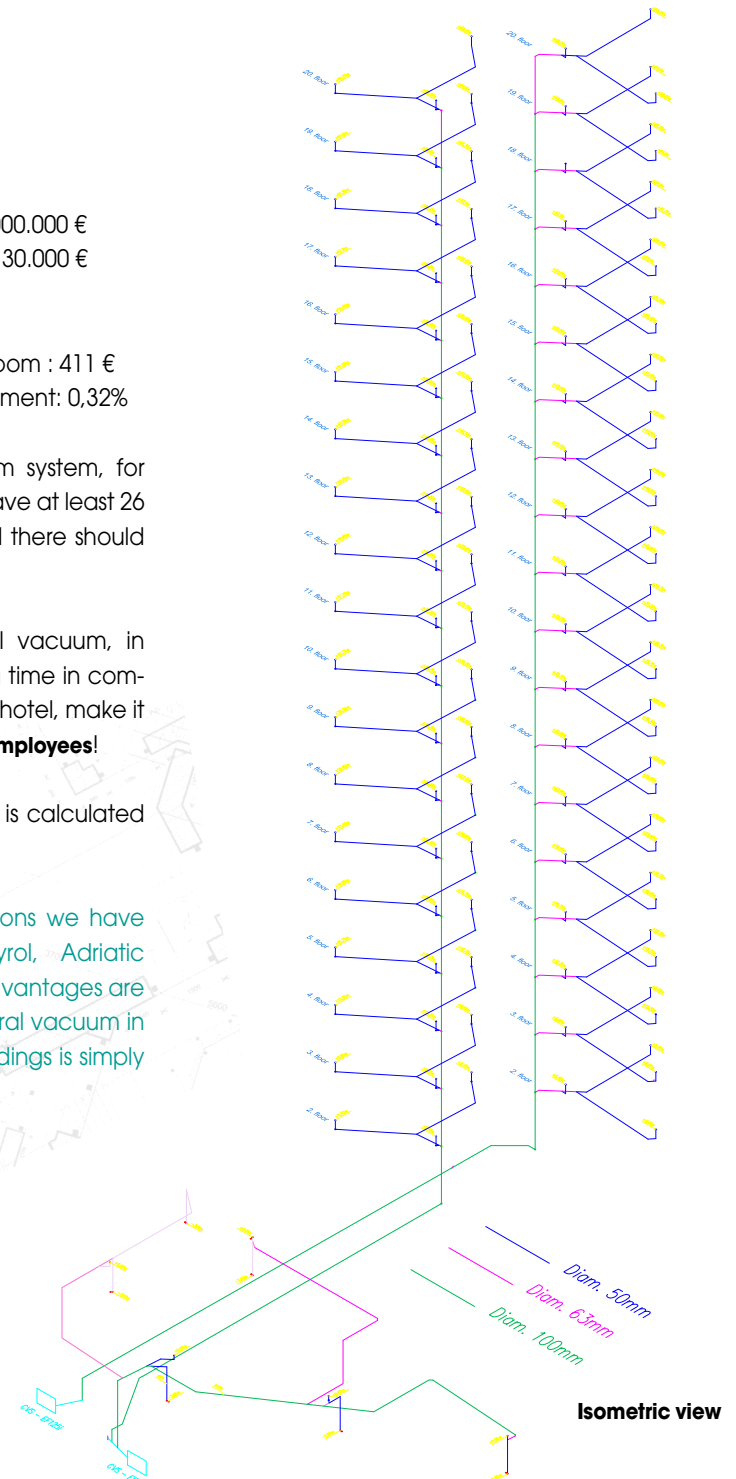
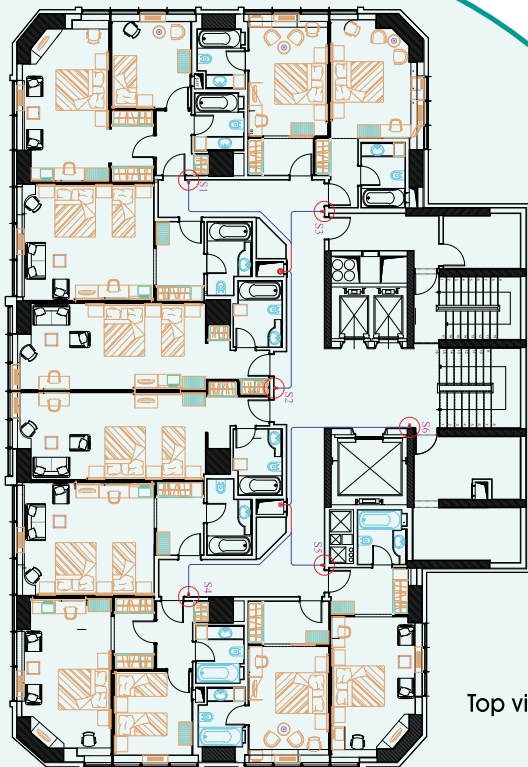
- Total investment for this hotel: 28.000.000 €
- Total investment for each room: 130.000 €
- Total investment for the central vacuum system: 88.000 €
- Investment for the CVS for each room : 411 €
- Percentage of CVS on total investment: 0,32%

With a traditional portable vacuum system, for the daily cleaning, it necessary to have at least 26 chambermaids, as in a 5 stars hotel there should be 1 chambermaid / 7,5 rooms.

The **economic benefit** of a central vacuum, in particular the reduction of cleaning time in comparison to traditional vacuum in this hotel, make it possible to **save with a CVS about 6 employees!**

The amortization of this systems is calculated in 3 years.

For these economic reasons we have some region (South-Tyrol, Adriatic Coast), where these advantages are well known, than central vacuum in hotels and office buildings is simply standard.





## Case study II

### Application: Large Company's Headquarter

This new building is made by **2 towers with 12 floors each** (5 underground and 7 over). The surface to clean is 41.000 square meters and further there are 23.000 square meters left in the garage and in the technical floors.

The length of the pipeline, **running in the drop ceiling** in alternate floor, is in different diameters:

Pipe 50mm: 1.440 ml; Pipe 63mm: 3.800 ml

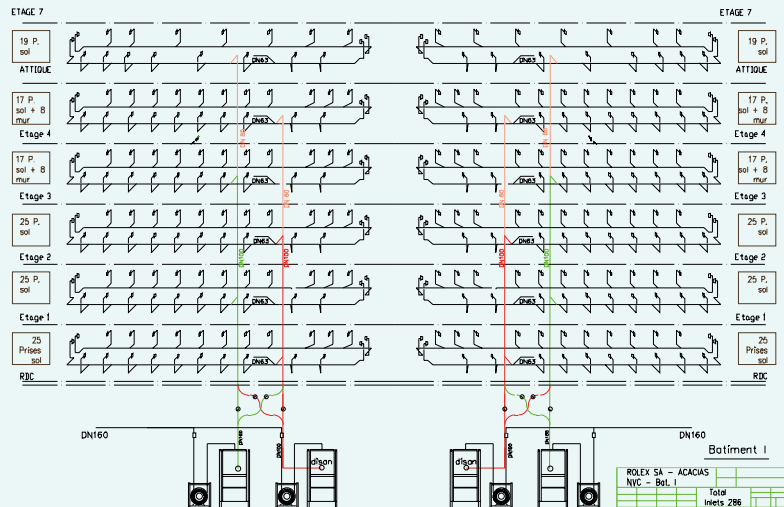
Pipe 80mm: 160 ml; Pipe 100mm: 600 ml

Inlet valves are located both in the floor and on central walls.

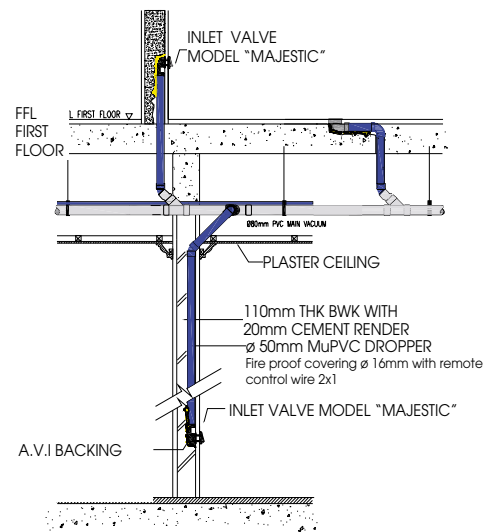
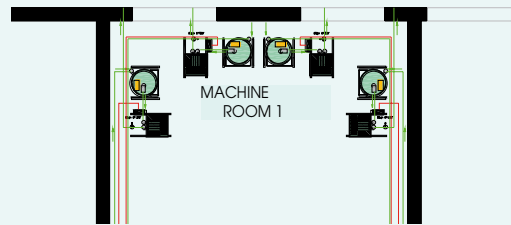
There are **8 central units EF125i** located in the technical gallery (-5). Each motor can be bypassed in case of one failure (never happened since commissioning in 2006).

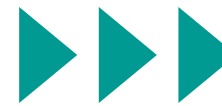
For the particularity of production, the building has to be **cleaned up** every working day within a time of **only 20 minutes**.

The turnkey cost of the CVS was 350.000 Euro.



Schematic view





## Case Study III

### Application: Food Factory

In this 10.000 sqm production plant the hygiene is a top priority. The space is occupied by an high density of robots and conveyor belts, so it is difficult to reach the floor surface for the daily cleaning.

The 165 inlet valves are scattered strategically to cover all surface of the plant. All inlets are mounted on or around automated robots. The length of the pipe run is: 10 meters in Ø125mm, 250 meters in Ø100, 160 meters in Ø80mm, at 1.475 meters in Ø63mm and 850 meters in Ø50mm.

There are 2 central units HK175i with a total power of 36kW that permits to 18 people to vacuum simultaneously.

Total investment for CVS: 125.000 Euro





## Case study IV

### Application: Automatic car wash

This new building is a mix of different systems in one place. The car wash system can be used to vacuum up to 18 cars quickly and simultaneously in the interior cleaning department. Then also the showroom, the workshop and the offices, so another area of 3500 sqm is supposed to be clean with same system.

A smart device, with PLC, controls that the 33kW vacuum pump equipped with frequency converter will keep the energy consumption at the minimal and always related to instant need.

What's absolute new about this system is that the exhausted stream, that for the compressing process by the vacuum has an average temperature increase of 40 C°, is conveyed to an heat exchanger to be transformed to office main heating in winter time.

Total investment for CVS: 55.000 Euro

Payback time: 3 years





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