

Getting it Right from the Start...that's Optimization. CVC Option



PV Vacuum Engineering Pte Ltd
(A member of Darco Water Technologies Limited)



User Preference that has an Impact on Cost

A)-Vacuum Inlet Valve / Socket

S/N	Type	Price	Remarks
1	Standard Wall Type Vacuum Inlet Valve / Socket.	Below Average	
2	Wall /Floor Type Vacuum Inlet Valve/Socket In epoxy coated or galvanized carbon steel.	Average	
3	Wall / Floor Type Vacuum Inlet Valve/Socket in stainless steel or aluminium.	Above Average	

B-Vacuum Cleaning Hose & Cleaning Accessories

S/N	Type	Price	Remarks
1	Basic 10 m Cleaning Hose & Accessories.	Below Average	
2	Crush Proof, Smooth External, Light Weight, Minimum Static Drag Type 2, 8, 10, 12, 15 m Cleaning Hose & Accessories.	Average	
3	High Temp Or Chemical Resistance, or Anti-Static Crush Proof, Minimum static drag type 2, 8, 10, 12, 15 m Cleaning Hose & Accessories.	Above Average	

C-Piping Network

S/N	Type	Price	Remarks
1	Common UPVC Piping Network.	Below Average	Require Special Installation Attention such as not using 90 Degree Elbow Fitting or "T-junctions", etc.
2	Common UPVC Sch 40 or 80 Piping Network.	Average	
3	Proprietary Custom Made Piping Network with a balance combination of Galvanized or Aluminium or Stainless Steel Pipe to address Static Electricity & Noise Issue complete with Directional Junction and Elbow with 2.5 Times Diameter Turning Radius for Low Resistance Flow.	Above Average	

D-Small Central Vacuum Machine

S/N	Type	Price	Remarks
1	Standard Off The Shelve Package for 1 to 2 users.	Below Average	Such system usually have a limited Furthest Pipe Length of up to 60m (1 to 2 users) & 100m (3 to 5 users) only.
2	Standard Off the Shelve Package for 3 to 5 users.	Average	
3	Vendor with Well Established After Sales Support Structure.		

E-Big Scale Central Vacuum Machine / System

S/N	Type	Recommendation	Remarks
1	Cleaning Capability.	PER MRE	Equal / Exceed Hard Floor, Cleanroom Floor & Carpeted Floor.
2	Waiting Probabilities.	5% or less	
3	Automated Piping Cleaning Mechanism.	Yes	
4	Well Documented Design Portfolio.	Yes	
5	ISO 9001: 2008 & OSHAS Certified Vendor of Central Vacuum System.	Yes	
6	Vendor with Well Established After Sales Support Structure.	Yes	

A-Vacuum Inlet Valve or Socket

Basically, there are 3 categories. They are;

- Standard Wall Type Vacuum Inlet Valve/Socket.
- Wall / Floor Type Vacuum Inlet Valve/Socket in Epoxy Coated or Galvanized Carbon Steel.
- Wall / Floor Type Vacuum Inlet Valve/Socket in Stainless Steel or Aluminium.

Standard Vacuum Inlet Valve/Socket

This is the cheapest of the 3. It is usually made of ABS Plastic.

It can be designed to trigger the start of the system when the Vacuum Cleaning Hose is inserted into it.

It also usually does not come with a matching Anti-Clog Device that help to prevent long, clog causing object from entering the system piping network.

Wall / Floor Vacuum Inlet Valve/Socket in Epoxy Coated or Galvanized Carbon Steel

This is more expensive than the Standard Vacuum Inlet Valve/ Socket due to its material of construction.

It can be designed to trigger the start of the system when the Vacuum Cleaning Hose is inserted into it.

It also usually come with an anti-clog adapter that prevent long thin object that can clog the piping network from entering the piping system.

Wall / Floor Type Vacuum Inlet Valve/Socket in Stainless Steel or Aluminium

This is the Most Expensive of the 3. Its material of construction make It for robust to handle corrosive environment.

It can be designed to trigger the start of the system when the Vacuum Cleaning Hose is inserted into it.

It also usually come with an anti-clog adapter that prevent long thin object that can clog the piping network from entering the piping system.

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B-Vacuum Cleaning Hose and Its Accessories

The construction of the Vacuum Cleaning hose had a direct cost impact depending on its ability and reliability / durability.

Features such as Crush Proof, Internally Smooth, Anti-Static, Chemical Resistance, High Temperature, Externally Soft, Length, Control Wire Embedded, etc are some of the common differences that are available in the market.

Features such as Anti-Static are useful if safety is a key consideration. Static Electricity is generated if the hose is subjected to prolong use due to the fast moving dirt/ particle within it. Hence, hose that does not have this capability tend to give the user a sensational rude unexpected shock which might be a cause of a potential accident.

Using a Longer Cleaning Hose can also means a reduction of construction cost because there is a need of lesser installed Vacuum Inlet Valve/Socket and pipe. However, any cleaning hose above the length of 15m will also be a challenge for the user to master.

Cleaning Hose in a Hose Drum. This allow the user to have the convenience of ease access and safe keeping of the vacuum cleaning hose. A useful feature to have when you have operator that need to repeatedly use the system for a short period of time.

C-Piping Network

Proprietary piping and fittings produced by Central Vacuum Cleaning System Manufacturer usually address the issue of Clog Free Elbow and Directional Junction with Industrial Recommended Turning Radius of 2.5 Times the Diameter. It also strike the best balance between Anti-Static Capability, cost & noise issue.

Anti-Static Capability is usually considered here because without it dirt/dust might sometime build up at Elbow due to static electricity. This is most evidence when one look at the carpet/ floor cleaning tool of most vacuum cleaners. It is easily noticeable that some form of dirt build up will happen at the air passage way of the tool after a certain time of usage.

D-Small Central Vacuum Machine

Broadly it can be classified into 2 Groups.

- Central Vacuum Machine that has single stage dust separation and
- Central Vacuum Machine that has 2 Stage Dust Separation.

The Single Stage Dust Separation Machine either uses a fabric filters to capture the dust or a cyclone to separate it from the air stream. In either case, a perfect situation is difficult to achieve, because it is using a single stage to try to achieve the capability of what it should be a 2 stage process.

In a 2 Stage Machine, the first stage is usually designed as Centrifugal. This allow bigger dust particles that will clog the finer filter to be separated and protect the finer filters from big sharp object that might puncture it.

The second stage filter is usually a cartridge filter that is able to trap the finer dust particle to ensure that the discharge air will meet or exceed Most Environmental Discharge Regulation Worldwide such as PM 10 or PM 2.5.

E-Big Scale Central Vacuum Machine / System

Similar to other big scale systems, design assumption & features has a direct impact on cost.

Some of the key design assumption are;

Cleaning Capability

Depending on the cleaning task, flooring type, cleaning expectation, the design air flow rate and achievable vacuum level at the point of use varies.

Technically, people in the industry call this MRE which is based on The American Society for Testing and Materials Standard Laboratory Test Method for Evaluation of Carpet; with a specific dust loading of 40 g/m² & 1 g/m².

Waiting Probability

This deal with the Probability that a user in the system will have to wait to join the system to avoid affecting the system cleaning capability in the worst case scenario for the development. The recommended Design Waiting Probability Percentage is usually 5% or less for the worst scenario.

Automated Pipe Network Self Maintenance / Internal Cleaning

In a big scale system, there will always be the possibility that under normal usage situation the Normal No of Users in the system is lesser than the Design Intended No Users. Hence, settlement within the piping network of heavier particle due to a lower than desirable conveying velocity is highly possible.

Thus, an automated Pipe network self-maintenance / internal cleaning mechanism will always be beneficial in the long term for its owner.

Well Documented Design Portfolio

It is always beneficial to the ultimate owner of the system when there is a well-documented approved design portfolio with documented design calculation on System Static, Waiting Probability and System Cleaning Capability beside As-Built Drawings.

Such document allow the owner of the system to take informed decision in the future for any changes, upgrading or re-configuration.

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