



# **ATLAS MOBILE VACUUM SYSTEM**



**We Change Air Into  
tools**

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## **1. MOBILE VACUUM SYSTEM**

### **1.1 Intended Use**

ATLAS mobile vacuum system is used for catalyst unloading and dry dust media. It is cleaned by compressed air pulses. Plant equipment and filter elements have been designed to satisfy local requirements with respect to dust type and concentration.

This manual comprises the operation and maintenance instructions for the equipment. It includes information about the product, commissioning, operation, maintenance, electrical circuit diagram and machine layout plan.

All the drawings provided in this manual represent standard elements. Hence, the actual installation at site may differ from the drawings shown in this manual.

This manual is especially for the Plant Owner, operators and maintenance personnel only. Any outsider who holds / keeps the manual is prohibited.

### **1.2 Main Components**

- Multi-stage Centrifugal Vacuum Exhauster
- Explosion Proof electric motor and drivers
- Control panel
- Start-up regulating valve, anti-surge valve and flexi-connection
- Filter separator comprising filters and automatic reverse pulse-jet filter cleaning
- Level sensor
- Manual discharge valve
- Discharge silencer

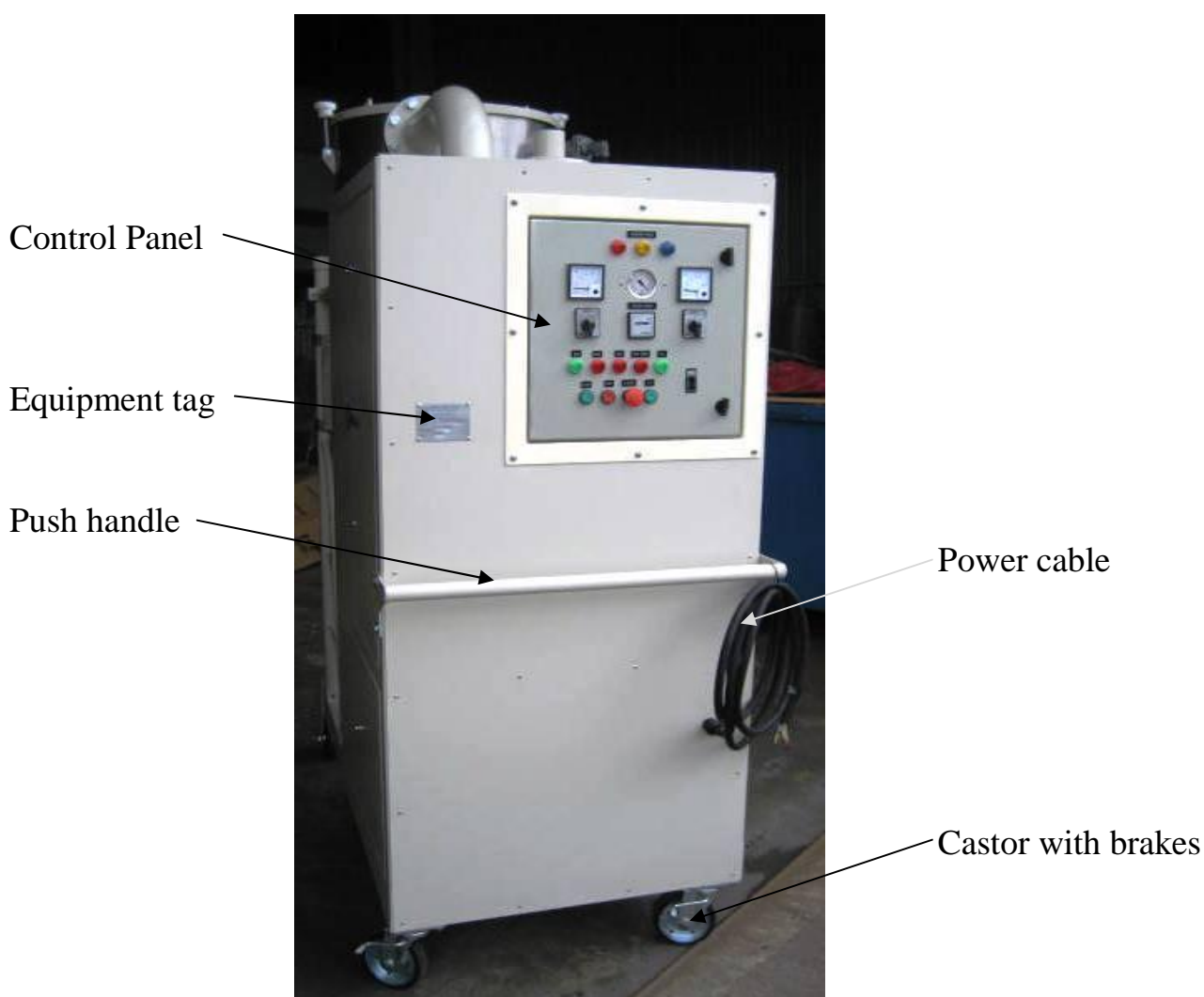
### **1.3 Equipment Activation**

The machine can be activated by the start push button located at the electrical control panel with the power supply on. Please ensure that the rotation of the vacuum pump is correct with reference to the direction of the arrow as indicated on the pump.

Catalyst handling work can commence as soon as the machine is running when the equipment is on the ON mode. After the operation, the equipment is preferably to be switched off to conserve power although the vacuum pump is designed to operate continuously.

Catalyst or unwanted dust are sucked and transported via the vacuum hose and deposited at the filter separator. The larger particle will settle to the bottom of the hopper and the finer ones would be filtered by the high efficiency polyester cartridge filters before it is vented to the atmosphere.

If the sucked material reaches a predetermined level, the level sensor will be activated and trigger an alarm and the equipment will come to a halt. The cleaning process will resume when the sucked material in the collection bag is discharged.

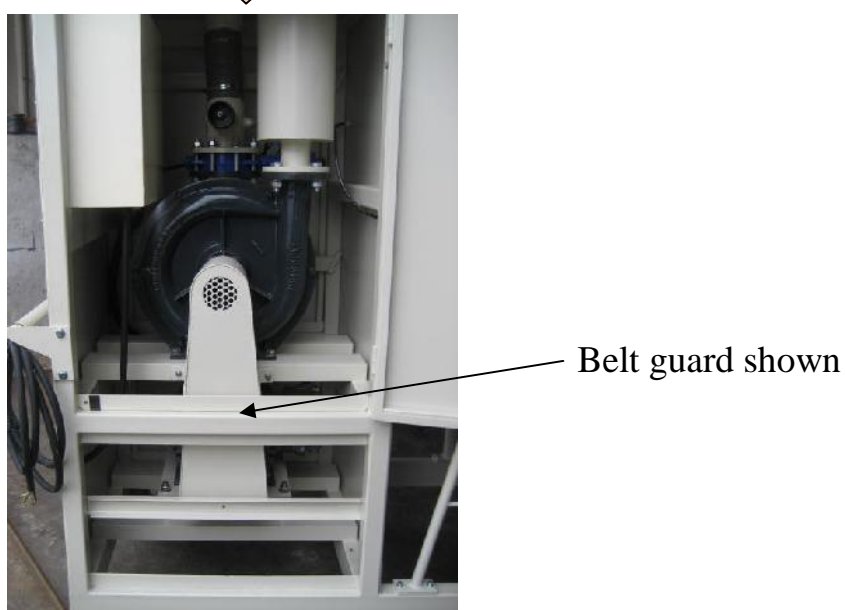
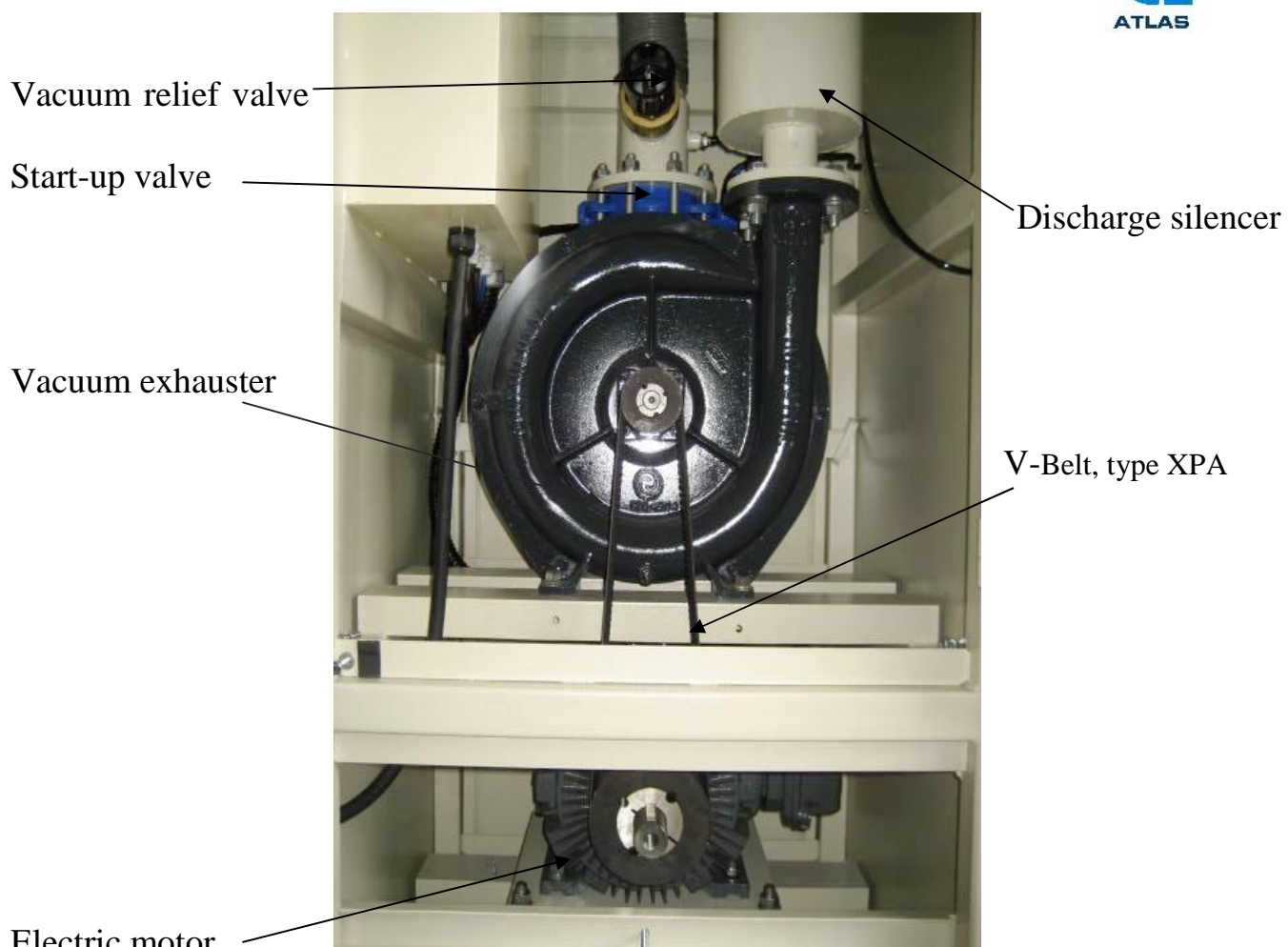




## 2.0 Vacuum Pump and Motor

- Pump Manufacturer : CONTINENTAL INDUSTRIE
- Type : Multi-stage Centrifugal Turbine
- Country of Origin : France
- Motor Manufacturer : TECO
- Type : Explosion-proof increased safety

Multi-stage centrifugal vacuum exhauster is a grease-lubricated, air-cooled and driven by V-belt transmission. The Explosion-proof(Increased-Safety) motor is 11kw(15 HP), with premium efficiency IP 55 protection, three phase 415V,50Hz. The details are per attached specification sheets.





### 3.0 Dust Collector

The dust collector comprises the following:

- Filter Separator
- Level Sensor
- Cartridge filter
- Compressed air reservoir
- Automatic reverse pulse-jet filter cleaning

It is also known as the filtration system of the Vacuum System.

#### 3.1 Filter Separator

The Filter Separator is made of Stainless Steel 304. It is a highly durable and corrosion resistant material. Particles or materials that were sucked/vacuumed by the cleaning tool will be deposited at the filter separator.

The larger particle will settle at the bottom of the filter separator by cyclonic action while the final dust/material will be trapped by the high efficient cartridge filters. When the sucked material reaches a pre-determined level, an automatic signal feature will trigger an alarm to indicate that the sucked material in the filter separator is full. The signal to trigger the alarm is emitted by a level switch, which detects the material level in the filter separator.

The sucked material can be discharged through the manual discharge valve with a manual operating lever lock system. The deposited material will be collected by the collection bag fixed at the manual discharge valve by brackets. The collected material in the collection bag has to be emptied periodically to avoid carry-over of the powder if the collection bag is over filled. Therefore the frequency of disposal of the collected materials would depend on the amount of collected material powder/dust in the collection bag.

The dust/powder that adheres on the surface of the filters will be purged by the automatic reverse pulse-jet filter cleaning system.

The filters are recommended to be cleaned manually once every 12 months depending on the state of the filters.



Filter cleaning valve

Air reservoir



Level sensor

Manual discharge valve

### 3.2 Level Sensor

The level switch has the following specifications:

- Model name : LV-200S
- Locked torque : 0.049N/m or less (fixed)
- Number of revolution : 1rpm (60Hz)
- Supply voltage : 220 VAC
- Allowable voltage fluctuation range :  $\pm 15\%$  of supply voltage
- Contact capacity : 220 VAC 5A (resistive load)
- Ambient temperature : 0 to 55°C
- Case material : Aluminum die-cast
- Cover material : Hard resin

The level switch will detect the sucked material level in the filter separator. If the sucked material in the filter separator has reached a pre-determined level, the level switch will emit a signal, which trigger an alarm and the power to the machine will be cut-off.

### 3.3 High Efficiency Polyester Cartridge Filter

The dust collector consists of 2(two) numbers of cartridges with the following design information:

- Material : Polyester, anti-static.
- Specific weight : 250 g/m<sup>2</sup>
- Air permeability : 100 l/m<sup>2</sup>/s @ 100 Pa
- Average dust spot efficiency : 80% ~ 90%
- Average dust arrestance : >99%
- Filter classes (BIA Standards) : U,S,G,C





### 3.3.1 Procedure for Filter Removal / Assembly

1. Loosen the latching device by turning the nylon nut anti-clockwise. (**Fig.1**)
2. Remove the top separator cover (**Fig.2**).
3. Remove the filter blow pipe assembly from the plenum (**Fig.3**)
4. Loosen the nuts fastening to the filter lugs.(**Fig.4**)
5. Remove the filter from the filter plenum by pulling in an upwards motion.(**Fig.5**)

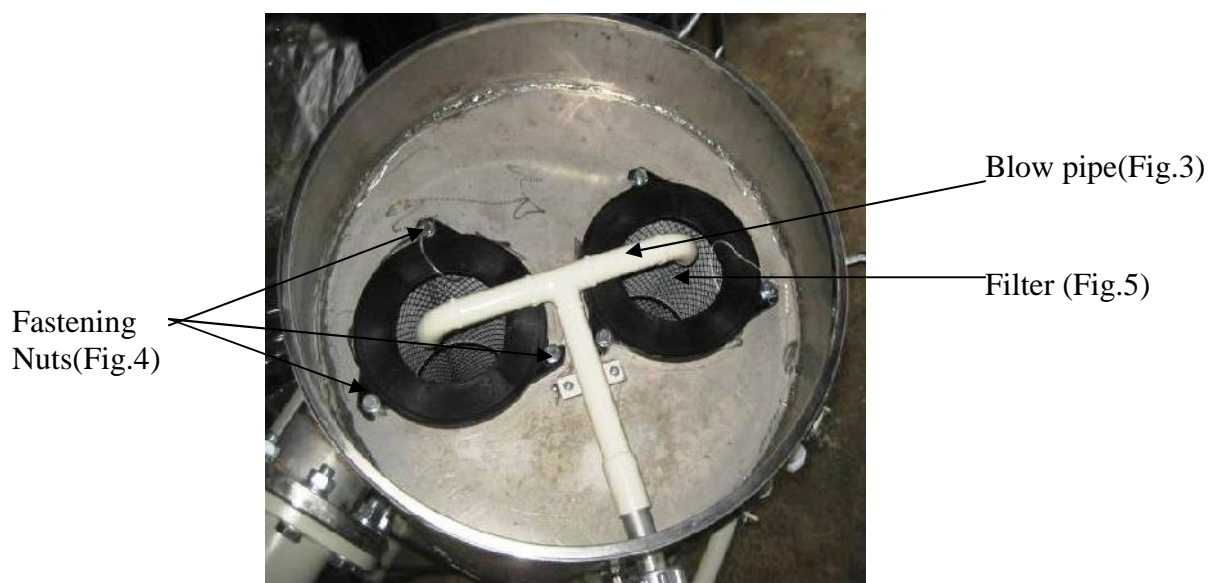
Perform the above procedure in reverse manner for the filter assembly to the dust collector.



**Fig.1**



**Fig.2**



### 3.3.2 For Manual Filter Cleaning

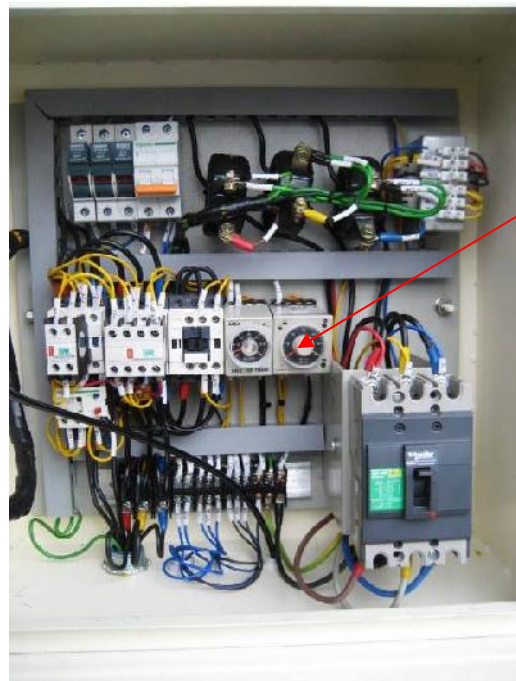
Using compressed air purge at the filter's pleats inside out is sufficient to clean the filter surface. It is however recommended that cleaning of the filter be done away from canteen, pantry, enclosed area, closet or inside an air conditioning room, etc. Filters should be changed if they are too soiled which would affect the efficiency

The cartridges are recommended to be changed once every 8–18 months depending on the state of the filters.

### 3.4 Automatic reverse pulse-jet filter cleaning device

The dust/powder that adheres on the surface of the filters will be cleaned by the reverse air pulsing system automatically at a predetermined time interval while machine remain operation, by means of a Sequential Timer Controller.(**Fig.A**)

This sequential timer controller will initiate the compressed air pulse by opening the diaphragm valves (**Fig.B**).Pulsing times can be changed easily in order to change the pulsing duration and frequency period. While one cartridge filter is being cleaned, the other units remain operative. This will ensure the filtration to be good at all times.



#### 4.0 Start-up / Flow Regulating Valve

The main function of this valve is to regulate the airflow into the inlet of the vacuum pump when the machine is started up to reduce the starting power load. It is fitted directly on the inlet opening. The valve is suitable for both on-off operation and for regulation (C)

#### 5.0 Anti-surge valve

The anti-surge valve is used to prevent the pump operating at capacities lower than the minimum admissible, to prevent surge coming into operation. The valve is fitted immediately up line from the inlet opening to allow air to be taken directly from the atmosphere.

In some case, the efficiency of the anti-surge valve can be impeded by the operation of the cutoff/regulation butterfly valve fitted at the pump inlet.

The anti-surge valve prevents the pump from operating at surge area (minimum airflow) to prevent damages to the pump. (D)

The valve is factory preset and calibrated at 5”Hg

