AirBench™ AirTower

Operation and Maintenance

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1.0 CAUTIONS

Use the AirBench only for the designed duty – consult the manufacturer on any change of use.

Each unit is marked with its design application, which is also shown on the commissioning certificate.

Do not mix incompatible materials e.g. steel and aluminium.

It is the users' responsibility to comply with this legal requirement.

This unit is not ATEX rated.

It is your responsibility under ATEX regulations to ensure the AirBench is located in an area rated suitable for the specification of the AirBench.

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2.0 INTRODUCTION

2.1 Overview

Thank you for choosing AirBench as your fume or dust control system. Please read this document before installation and use.

This document details maintenance activities which are essential to the safe use of your AirTower. We recommend that the Responsible Person reads this manual fully prior to installation and operation of the AirTower.

This document refers to the AirBench AirTower range. The filter configuration in use is detailed on the system Commissioning Certificate and is used within this document to provide filter-specific maintenance information.

2.2 About AirTower

AirTower is a self-contained extraction unit which utilizes a fan and filter combination to provide dust/fume free air into a work space area.

Extracting dirty air near the ceiling of any workshop and providing safe air at working level; the AirTower is a cost effective way to improve air quality and also improve heating costs in any work environment when a direct extraction method may not be possible.

It uses a high pressure fan to pull air into it from its top which is sent through a pre separator to remove any unwanted particles from the airflow. The air is then passed through filters and then back down to ground level where clean air is exhausted.

AirTower works as a passive machine, quietly working in the background to improve the environment for any workshop operators.

2.3 About this Document

This document provides general maintenance and operation instructions for the AirBench AirTower range. It should be read in conjunction with the Commissioning Certificate supplied with the unit.

If you have any concerns or doubts about maintenance or operation of this unit, contact the manufacturer.

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3.0 INSTALLATION AND ASSEMBLY

3.1 Installation - General

The AirTower would be delivered in two halves for ease of transport. Unpack each half and check for damage, if not already completed.

The AirTower must be installed on a flat and level floor capable of carrying the weight of the unit. For nominal unit weights, see Technical section at rear of manual. When determining an installation location, be aware that the air exhaust must discharge somewhere. Do not position the unit so all outlets are blocked.

These units are designed to be moved using a fork lift or pallet truck and have integrated lifting eyes at their base. Take care when lifting and moving the tower.

3.2 Assembly - General

The AirTower will come in two halves for ease of transport. As such some assembly will be required when receiving the AirTower before it can be used.

The base section has built in slots to take fork lift arms. The tower base can be moved using these and placed where it is being installed. A pump/pallet truck will also be able to move the base section around if required.

Finally the top section will need placed onto he base section and fixed together. Lifting eyes are provided or will be found in a bag of fixings, delivered with the tower.

Figure 1 - AirTower assembly in two halves

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3.3 Installation and Assembly - Electrical

The towers are tested in house before being delivered, making sure all electrical features perform as desired. As the tower needs to be assembled on site a small amount of wiring will be required when joining the pods together.

3.3.1 Wiring

AirTower's are supplied as standard with an internal fan or fans. Electrical connections will be provided as male and female components and labelled as such. Electrical work should be carried by a trained professional and if you have any queries please contact the manufacture.

Standard electrical supply is 415V/3Ph/50Hz.

BS7671 requires that the lead is appropriate for the working environment and you must satisfy yourself that the pre fitted lead is satisfactory.

3.3.2 Fuses and Circuit breakers

Fuses are provided behind the control panel, mounted in holders on din rail. Motors are protected with a motor protector that will trip in the case of a large inrush current.

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4.0 COMMISSIONING

4.1 Commissioning - General

The initial commissioning and testing of your AirTower has been performed prior to delivery. However, as part of in-house commissioning we recommend that you complete the following tasks and record the results as appropriate in the system logbook.

4.2 Commissioning - In House

The following tasks should be completed by a responsible person; for example, the Health and Safety Officer, or Director, responsible for this process.

- Review the commissioning certificate for this unit, in particular any notes made by our engineer in relation to use.
- Ensure all operators are trained to use this machine and are aware of the effective capture zone in which they should aim to work.
- Ensure all operators are aware of the filter maintenance routine required for this machine.

Once complete, you should note this on the commissioning certificate and retain the certificate for future reference.

As operating conditions vary, each installation will vary in maintenance needs and this is best established by empirical means, regularly checking filter condition in the first weeks of operation to establish a procedure. Reduced airflow is a key indication of filter condition. If the filter pressure gauge on the front of the unit is showing in the red zone, this indicates low airflow and filters should be checked and cleaned or changed promptly, according to the instructions contained within this manual.

We recommend keeping the commissioning certificate, Quick Start guide, and logbook with the machine at all times for operator access.

If in doubt please contact the manufacturer quoting the machine serial number.

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5.0 OPERATION

This page contains the same information as the Quick Start guide provided with your AirTower.

Check the system logbook to ensure no routine maintenance is required.

5.1 Operation – General Use

To use the Air Tower, ensure it is connected to a standard 3ph 16A supply using the plug provided. Turn on the switch on the front of the bench.

If a speed controller is fitted, turn it to full power before switching on, then adjust it to an appropriate level.

During commissioning, an optimum setting may have been determined and this should be noted in the system logbook.

To use the AirTower, first make sure that the unit is fully assembled and commissioned with no obvious obstructions on the inlet or outlets. Ensure that the tower is plugged into the mains socket and that the socket is switched on.

Turning the tower on should increase the internal pressure moving the filter gauges. Check each gauge on the unit when first turned on to make sure they are all working and that none of them are in the RED zone, which would signal a dirty filter. If the gauges are still within the GREEN zone then the tower is ready to use.

Note that the fan will take some time to initialise and come to maximum power. Extraction is not fully effective until the fan has reached full power.

The AirTower works passively, running in the background while work is carried out around it. Once the work has been carried out or at the end of a working day, turn the unit off ready to use again. Record any maintenance you have undertaken, or any that is required in the logbook. Please contact supplier if unsure of any steps.

5.2 Operating – Controls and Monitoring

All AirTower sizes come with a standard control panel as shown in the image below. This control panel will allow the operator to control all functions of the tower and monitor its performance.

The table below displays all components on the control panel and their functions

Item No.	Component Name	Component Function
[1]	Pressure Gauge	Displays internal pressure across the filters
[2]	Air Tank Gauge	Displays the header tank pressure

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[3]	Pulse Button	Activates the pulse cleaning sequence
[4]	Rotary Isolator	Provides and cuts power to tower
[5]	Rocker Switch	Turns the tower on and off, as long as power provided
[6]	Red LED	Signal pulse sequence is currently running
[7]	White LED	Signals that the tower has power provided to it
[8]	Green LED	Signals that the tower on with motor running
[9]	Inlet Nozzle	Inlet for compressed air to header tank

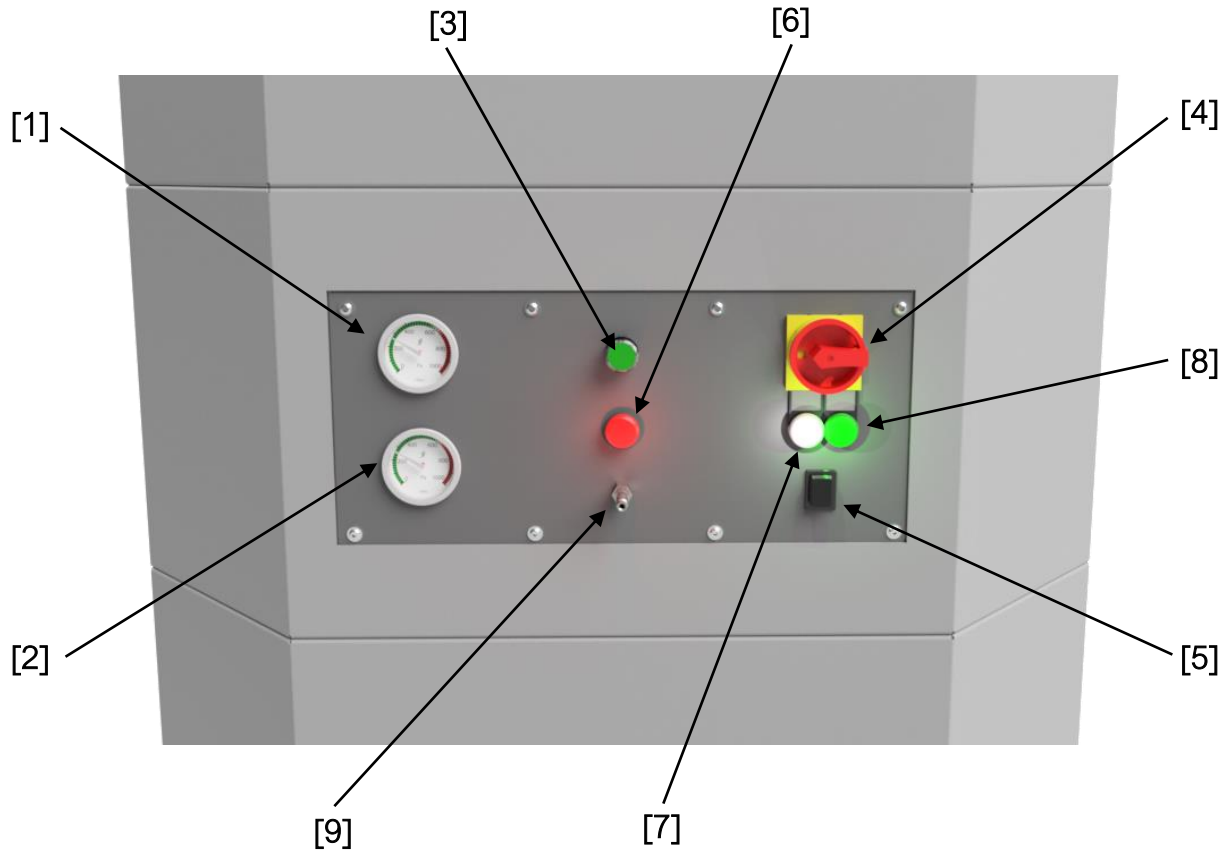

Figure 2 - Control panel functions an components

5.2.1 Operating – Controls: ON/OFF

Once the AirTower is installed and commissioned, the tower can be powered on. The control panel can be found on the side of the unit.

Turning the rotary isolator will provide power to the tower but it should NOT run at this point. A white LED will come on to show when power is supplied. Pushing the ON/OFF switch after this will turn the tower on, running the fan up in speed. At this point the green LED will illuminate to show that the unit is now running.

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Power can be removed and the unit turned off by pushing the ON/OFF button again and turning the rotary isolator off. In an emergency the isolator can be used to immediately remove power from the tower, turning it off.

5.2.2 Operating – Controls: Pulse System

The final button on the control box, provides the unit with its pulsing ability. By pressing this button and holding for 2 seconds the pulse system will be engaged. Over the next couple of minutes the tank will fill and discharge into the cartridge filters, blowing excess powder off from their surface.

The process will continue till all filters have been pulsed. The operator is then within their rights to run the pulse again if they feel the filters can be cleaned further.

Note that pulsing the filters will help improve their life but not indefinitely.

5.2.3 Operating – Monitoring: Pressure Gauges

There are two pressure gauges present on the control panel. The top pressure gauge is monitoring the tower itself taking a differential reading between the dirty and clean side of the filters. The bottom pressure gauge provides the pressure of the header tank located internally in the tower.

5.2.4 Operating – Monitoring: LEDs

Each tower has a set of three LEDs (red, green and white) that are used to determine its current status. The white LED determines that the tower has power or not. The green LED shows if the tower is running and drawing air or not with the red LED showing that the pulse sequence is currently being performed.

5.3 Operating – Access

During the life of the tower access may be required into the various sections. This could be due to general maintenance and cleaning as described on 6.0 of this document or to replace failed components.

As such the AirTower has been designed so that access can be obtained to every critical part.

Item No.	Access Name	Access Function
[1]	Filter access	To maintain, service and change cartridge filters
[2]	Collection Draw access	To remove excess dust buildup from tower and pulsing
[3]	Pulse System access	To maintain and service pulse system if required
[4]	Fan Housing access	To maintain and service fan and its housing area
[5]	Control Panel access	To maintain, service and change any electrical issues or faults

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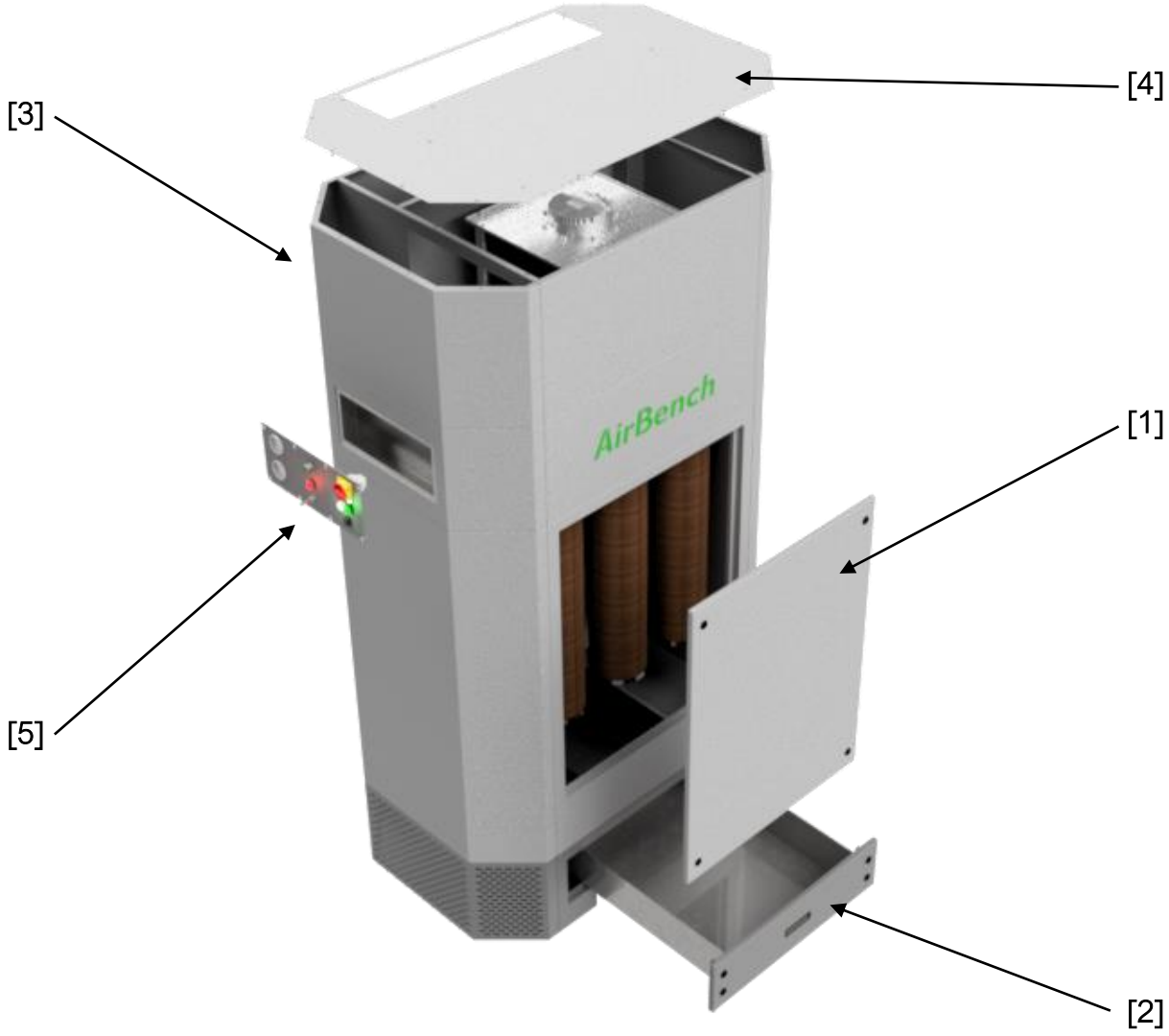

Figure 3 - Access positions around the AirTower

5.3.1 Operating – Access: Filters

The filter access for the tower can be found at the front of the unit. There are four latches at the front of the tower that can be turned to remove the filter front door. Once the door is removed the filters can be checked, serviced or replaced if required.

Unscrew the three bolts holding each filter to remove it from the unit. Take care when replacing filters as to not damage them which would compromise the effectiveness of the tower.

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5.3.2 Operating – Access: Collection Draw

During the running of the tower any particles in the air will be drawn into the machine and deposited in the collection draw found at the base of the unit. Baffles will direct any of the larger particles into this bin before they reach the filters.

Turn the four latches on the collection bin draw to unlock it from the tower. The bin will slide forward containing all the dust particles removed from the airflow. Once excess dust is removed the collection bin can be pushed back into place, engaging the latches to lock it back in place within the tower.

Below is a diagram showing the collection bin access.

5.3.3 Operating – Access: Pulse System

To gain access into the pulse system pod, which houses the header tank and pulse valves, a removable panel can be found at the back of the tower. This allows access into the inlet area, which contains a second panel to remove using tooling.

Please note that this is not illustrated on the access view above. Any work carried out on the pulse system should be carried out using safe workspace practices.

Access to the pulse system should only be required if a failure on the tower has occurred. If you are ever unsure please contact AirBench Ltd for assistance.

5.3.4 Operating – Access Fan Housing

Access to the fan should only be required if a failure has occurred within the unit. If it is required the access can be found at the very top of the tower. The roof plate can be unbolted using tooling and removed given large area of access to the fan itself.

Care should be taken when carrying out this process, making sure all appropriate PPE is used as well as appropriate equipment for working at height safely.

5.3.5 Operating – Access: Control Panel

The control panel should only require access if a failure has occurred and should not be required to do during normal operations of the tower.

In the event a failure has occurred, then access into the control panel can be achieved by removing the retaining bolts on the panels surface. Take care when removing the panel from the AirTower body as wires and airline connections will still be attached. These will need to be completely disconnected to fully remove the control panel.

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6.0 MAINTENANCE AND CLEANING

This page contains all the maintenance and cleaning routines required on the AirTower.

6.1 Maintenance and Cleaning General

The AirTower requires periodic maintenance for optimum performance. The maintenance period will vary based off use or the tower.

6.2 Filter Maintenance and Cleaning

Filters will need to be inspected regularly to make sure no damage has come to them during installation, operations or by the pulse system. All filters should be regularly checked for wear, damage, or by-passing. When completing filter maintenance activities these should be recorded in the accompanying log sheet.

If any filters are seen to be damaged they should be replaced immediately with a new one, in order for the tower to perform as designed.

6.3 Collection Draw Maintenance and Cleaning

Over time the collection bin at the base of the tower will begin to fill with particles taken from the air in the workshop. This will need to be periodically checked and cleaned out to make sure the tower is still performing as required.

Any buildup found in the drawer should be removed via the operates general local practices. Any excess dust can be wiped down off the surfaces.

6.4 Pulse System Maintenance and Cleaning

To increase the life of the filters, a pulse system has been integrated into the superstructure of the tower allowing the operator to manually perform a pulse clean.

The header tank found above the filters will perform a series of air pulses into the filters when the green push button is pressed on the control panel. The unit will carry out the pulse sequence, blasting excess dust off the outside of the cartridge filters. The timing and length of this pulse system will depend on the model selected.

An automatic cleaning routine can be produced to suit the exact needs of any work environment.

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6.5 Fan Maintenance and Cleaning

Like the pulse system, maintenance and cleaning of the fan and fan pod would only occur if a failure has happened to the tower. Maintenance and cleaning should be carried out yearly as a minimum to make sure no build up has occurred.

6.6 General Maintenance and Cleaning Routine

The below table sets out the general cleaning routine that should be carried out on the tower. The frequency of cleaning is outlined below however, depending on the application and amount of usage of the tower these periods of cleaning my need to be increased.

Weekly (1-2 weeks):

- Check collection drawer and remove excess dust if found
- Inspect filter condition and clean/replace when applicable

Monthly (1-6 months):

- Check fan chamber for any unwanted dust build-up
- Check pulse chamber for any unwanted dust build-ups

Yearly

- Open control box and check wire connections are fully secure and not damaged
- Check the fans fixings and all electrical connections are still tight and secure.
- Make sure header tank in pulse section is secured down still.
-

Take precautions and wear appropriate PPE when handing filters.

They may contain hazardous dusts.

To avoid fan overload, do not block the face or the air outlet.

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7.0 ACCESSORIES

Some accessories are only supplied if specified with purchase.

7.1 Hours Run Meter

The meter is not resettable and operates at all times when the speed control or switch is powered.

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8.0 TECHNICAL

8.1 Performance Data

Below is the technical performance data for the AirTower range.

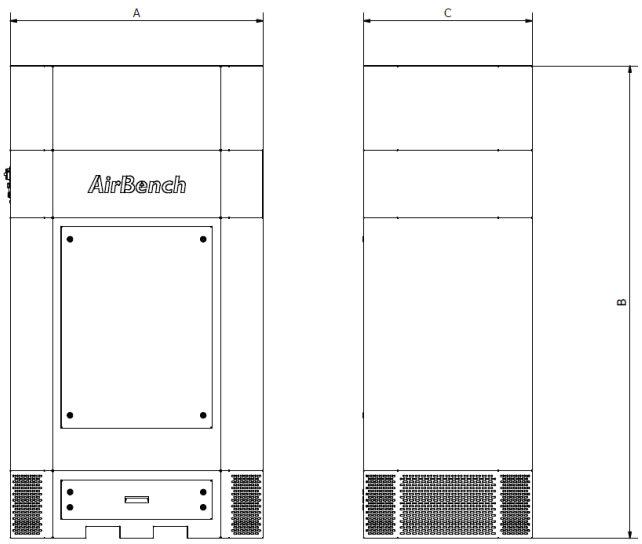
Model	Airflow	Pressure	Fan Power	Phase	Voltage	Max Current
	(m^3/h)	(Pa)	(kW)	(No.)	(V)	(A)
AT12	5000	1000	3.6	3	400	5.5
AT15	10000	1000	3.6	3	400	5.5
AT18	15000	1000	7.2	3	400	11

8.2 Size Data

Below are the sizes and weights of the AirTower range.

Model	Width	Depth	Height	Weight	Filter No.	Filter Area
	W (mm)	D (mm)	H (mm)	(kg)	(No.)	(m^2)
AT12	1200	1000	2800		4	80
AT15	1500	1000	2800		6	120
AT18	1800	1000	2800		8	160

Data shown is for standard models. Check the Commissioning Certificate for details specific to your unit.



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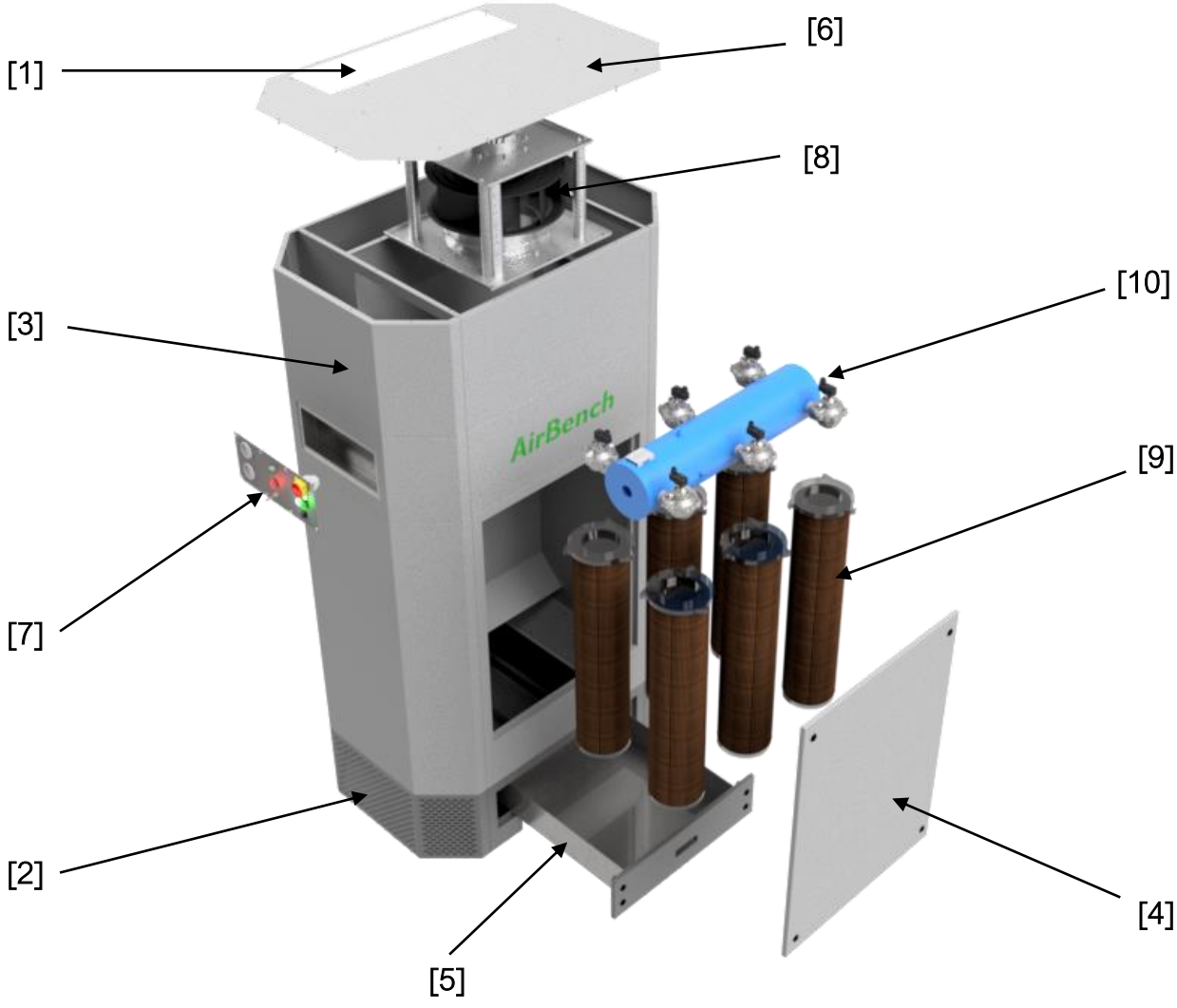
8.3 Arrangement : Schematic View

Item No.	Name	Function
[1]	Air Inlet (Dirty)	Inlet into tower of dirty airflow
[2]	Air Outlet (Clean)	Outlet out of tower with clean warmer air
[3]	Tower Body	Main body housing all the internals
[4]	Main Door	Main door for access into filters and tower internals
[5]	Collection Draw	Collects excess dust from air and pulse sequence
[6]	Tower Roof	Access into fan housing, inlet and outlets
[7]	Control Panel	All control functionality found on control panel
[8]	Fan	Generates airflow and negative pressure inside tower
[9]	Cartridge Filters	Prevents dust and particles traveling to clean side of airflow
[10]	Header Tank	For pulsing cartridge filters clean



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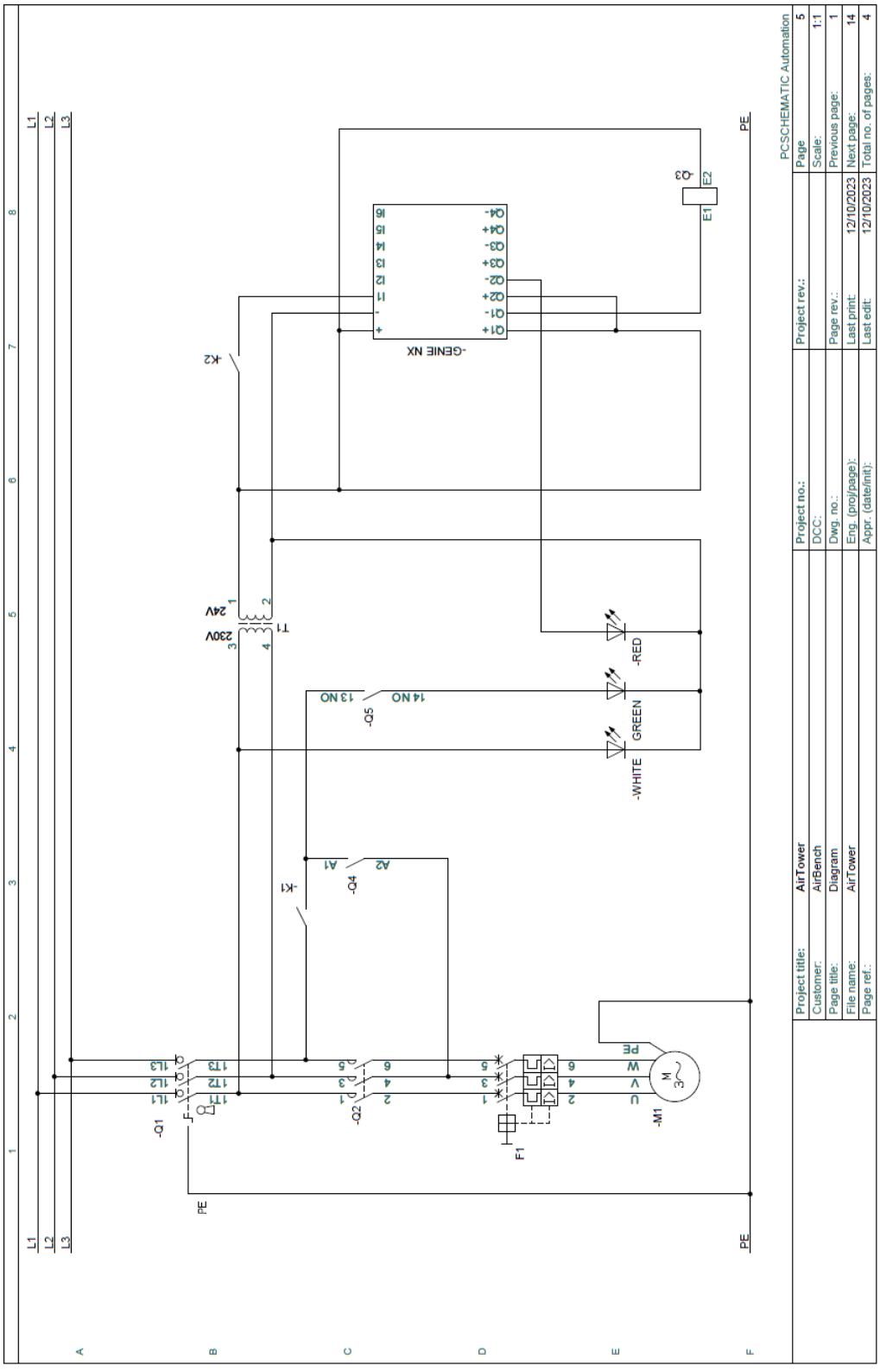
8.4 Wiring Diagram



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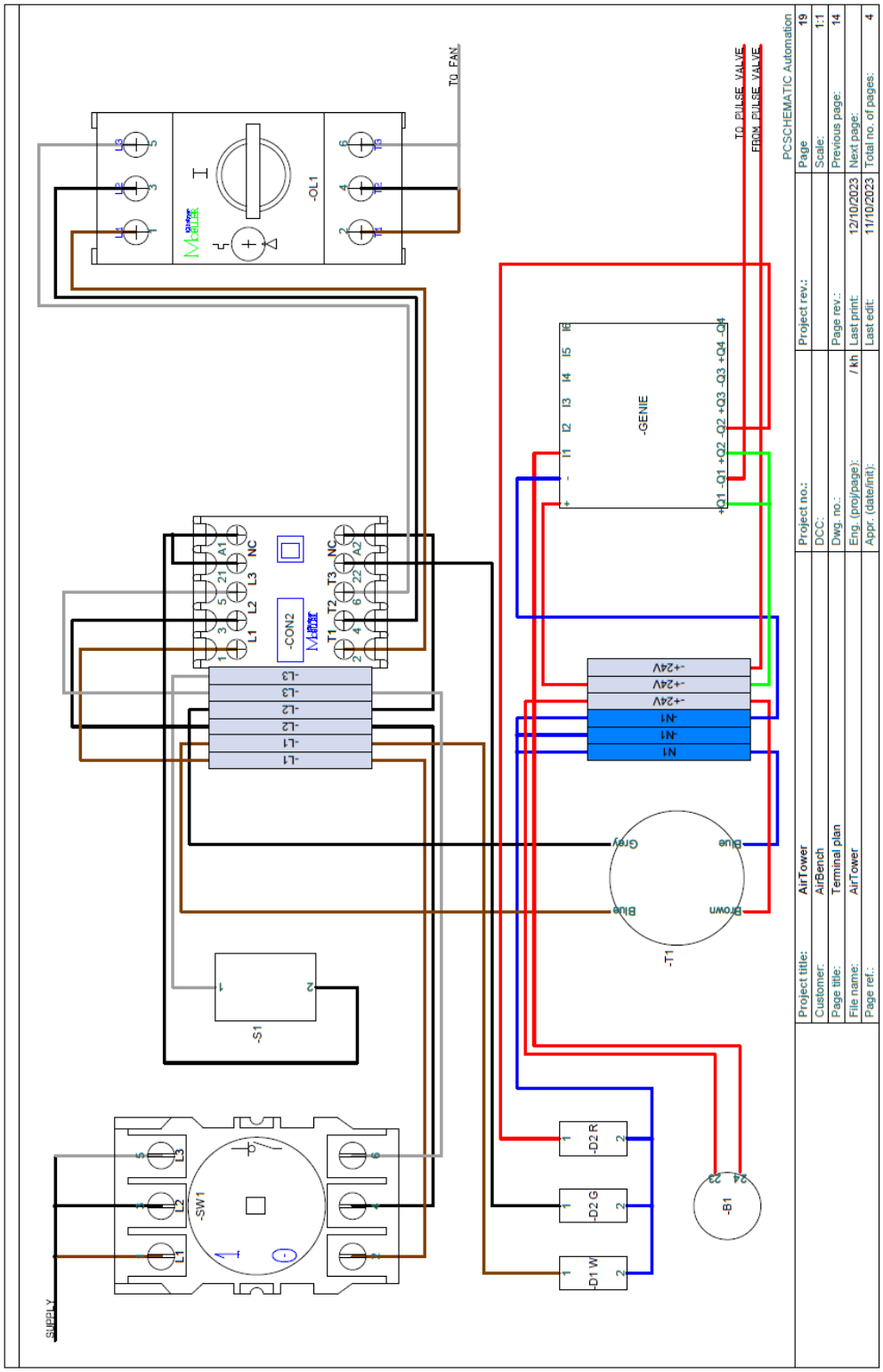
8.5 Component Diagram



DECLARATION OF CONFORMITY

Manufactured by:	AirBench Ltd. 6b Commerce Way, Colchester, Essex. CO2 8HR
Responsible Person:	Simon Cook
Description:	Air Cleaning System - known as “Air Tower”

DECLARATION OF CONFORMITY

BY AIRBENCH LIMITED

RELEVANT DIRECTIVES

EMC Directive 2014/30/EU (when connected to standard mains sinusoidal supply).

Machinery Directive 2006/42/EC

Low voltage Directive 2014/35/EU

- EN-60204–1:2018 (Safety of machinery, electrical equipment of machines, general requirements).

- EN-60335-2-80 (Safety requirements for electric fans and regulators).

We; AIRBENCH Limited, declare that “Air Towers” when supplied as self contained equipment comply with the directives detailed above and therefore comply with requirements of the Low Voltage Directive.

Simon Cook / Managing Director / 5th March 2021

Data shown is for standard models. Check the Commissioning Certificate for details specific to your unit.

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