USER MANUAL

for

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1. Introduction

This filter-cleaner is specifically designed for the cleaning of particle-filters in connection with service and maintenance.
When used correctly, the cleaner meets all required environmental demands.
In order to avoid operational disturbances and achieve maximum utilization of the cleaner, it is required that the operator is thoroughly familiar with this user's manual and follows its procedures closely.

2. Application

The filter-cleaner is designed for use in the cleaning of particle-filters for larger diesel engines.
The cleaners built-in cartridge-filters ensure that particles, damaging to ones health and released in the cleaning process, are collected in the cleaner.
If components other than particle-filters are cleaned, the manufacturer disclaims all responsibility with regard to safety and operation.

3. Mobile Construction

The filter-cleaner is specially constructed for mobile usage, and can be transported by van or trailer.
The cleaner can be flipped over onto its back during transportation.

4. Technical Specifications

Main measurements:	Width 800mm Depth 900mm Height 1600mm
Weight: 140 Kg	
Noise level:	73 dB (A)
Electrical data:	Voltage 230 V 50 Hz Motor 1.1 kW 7.3 A Light fixture 13 W
Compressed air:	Air consumption min. 500 liter/min. at 7 bar Filter-regulator set at max. allowable operational pressure
Process air:	Air led out into the open, nominal 800 m^3 /h
Cartridge-filters:	2 ø 225 x 600mm each 2.77 m^2 filter area
Regeneration:	Automatic regeneration of cartridge-filters after each cleaning process.
Monitoring:	Filter-pressure guage activates the alarm lamp when cartridge-filters are sullied.
Soot drawer:	35 liter cardboard drawer for soot collection.

5. Installation

5.1 Control

Inspect the filter-cleaner for possible transport damage. In case of damage, report it as soon as possible to the dealer.

5.2 Electrical connection

The cleaner is supplied with a four meter long cable with a plug attached. The plug must be connected to an electrical installation of 230 V + ground with necessary effect (see 4.4).

5.3 Compressed air connection

Connect the cleaner to a compressed-air system with the required capacity (see 4.5)
The compressed-air is connected via the 3/8" socket situated at the bottom of the cleaner's left side-plate.
The cleaner has a built-in filter-regulator, that ensures the quality of the compressed-air for the cleaning process as well as max. allowable operational pressure.
The cleaner can therefore be connected to any compressed-air supply with the required capacity.

5.4 Connection of process air

The filter-cleaner has a built-in centrifugal-fan, that supplies the necessary process air.
The process air is sucked from the cleaning chamber through the particle-filter that is to be cleaned, and is discarded through a connecting-piece (ø 160 mm) in the top-plate of the cleaner.
In order to meet required environmental regulations, the process air must be led from the cleaner into the open.
The connecting-piece must therefore be connected to a short and well-dimensioned pipe system with a suitable outlet.
If the cleaner is used in its mobile capacity at several cleaning stations, the connecting-piece can be fitted with a short, flexible hose, which can be connected to the individual cleaning stations pipe system.
Installation and evaluation of the pipe system for process air, must be carried out by specialist with required knowledge of air treatment and environmental requirements.

6. The Cleaner's Filter System

6.1 Filtration of process air

The cleaner has two built-in cartridge-filters for filtering soot and particles in the process air.
In order to ensure maximum operational conditions, it is important, that the filters are not clogged completely with soot so that the requirements for the process air change.
The cleaner therefore has a built-in regeneration system for the filters, which is activated automatically after each completed cleaning process.

6.2 Regeneration of cartridge-filters

The regeneration process consists of blowing large quantities of compressed air into the filters in order to release soot particles stuck to the surface of the filter.
The regeneration process starts when the suction process is stopped (see 7.4).
Regeneration takes place, while the built-in fan continues for 30 seconds.
The process sounds like five forceful bumps at short intervals.
With time, this release of particles from the filters will not be sufficient for optimum operation.
Therefore, a pressure guage monitors the operational pressure of the filters and gives an alarm when replacement is necessary (see 10.1).

7. Operating Instructions

Operating panel:
All operation and monitoring of the filter-cleaners is carried out via the operating panel (see photo 1), mounted on the front of the cleaner.

Stand-by: **POWER**
Turn the switch to the position shown in the photo.
The light in the cleaning chamber is turned on.

Commence suction process: **ON**
POWER must be activated.
Press the button.
Green light/operation on.
Suction process starts.

Stop suction process: **OFF**
Press button.
Regeneration process (see 6.2) is started.
Suction process continues for 30 seconds.
Green operating light off.

Clogged cartridge-filters: **FILTER**
Yellow light/alarm on.
The cleaner's cartridge-filters are clogged.
Refer to Operating Problems (see 10).

Photo 1

8. Safety Requirements

Operation and handling of particle-filters is subject to required environmental regulations. Therefore, it is a requirement, that the user is familiar with these regulations. Protective gear such as mask, bodysuit, and gloves are required as part of the protection.
If doubt should arise concerning the rules in effect, the relevant authorities should be contacted for further details concerning safety measures.

9. Cleaning Instructions

9.1 Temperature

It is important that the particle-filter is cooled sufficiently before it is treated in the cleaner. **The maximum temperature in the filter-core is 40ºC.**

Higher temperature will damage the cleaner and can cause fire!

9.2 Liquids and moisture

Fluid and moisture in the cleaning process will damage the filter-cleaner.
Particle-filters wet with water, cleaning fluid, oil or other liquids, must not be cleaned.

Moisture will damage the cleaner!

9.3 Transportation of particle-filters

Transportation of particle-filters to and from the filter-cleaner, is best served by a special filter-cart (see photo 2 – extra accessories 20). The filter-cart is outfitted with a fixture-plate (see photo 3), which is used in connection with the cleaning process, upon wich the filter can be placed.
Soot which falls from the particle-filters during transportation, is collected in a cardboard box on the filter-cart.

Photo 2

9.4 Fixture-plate for particle-filters

For every type of particle-filter there is a specifically adapted fixture-plate (see photo 3), which corresponds to the exterior diameter of the filter and to the suction-plate in the cleaning chamber (see photo 4).
When placing the particle-filter on the fixture-plate, it is extremely important to place the filter facing the correct way, so that the correct direction of flow is ensured in the cleaning process.The sooty end of the particle-filter, which faces towards the diesel engine in the exhaust system, **must** be placed in the fixture-plate.

Photo 3

9.5 Placement of particle-filters in the cleaning chamber

Turn the POWER switch (see 7.2) so that the light in the cleaning chamber is turned on.
The fixture-plate (see photo 3) with the filter, can be moved directly from the filter-cart (see photo 2) into the cleaning chamber and over the suction-plate (see photo 4).

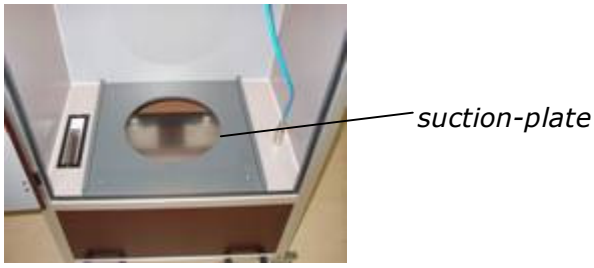


Photo 4

9.6 Blow pattern

In order to ensure that the compressed air from the blow gun (see photo 6) cleans each and every cell of the particle-filter when moving across its surface, a specially designed blow pattern is used (see photo 5).
The entire blow pattern is placed on the surface of the filter, so that it covers as much as possible.
By removing one half of the blow patter, a limited area of the filter-surface is exposed.
The remaining half of the blow pattern will be held in its position by the process suction during the cleaning process.
The exposed area of the filter is then systematically blown (see 9.7).
When the blowing process has finished, the removed half of the blow pattern is re-placed and the other half is removed.
The blow process is then repeated on the remaining area of the filter-surface.

Photo 5

9.7 Cleaning process

When the particle-filter is placed in the cleaning chamber (see 9.5) with the sooty side facing down (see 9.4), the operations hatch is closed.
The suction process is started by pressing the ON button (see 7.3).
The operations hatch to the cleaning chamber must be closed, so that all operations during the blow process is conducted through the sleeves in the lid-plate.
The blow gun (see photo 6), which is specifically designed for this process, is fitted with a valve through which the amount of compressed air can be regulated.
Hold the blow gun with one hand and use the other hand to carefully open for the compressed air.
Always open for just a small amount of compressed air and blow until the sootiness of the filter can be estimated. Loose soot, burned filter-cells, and worn-out and poorly maintained filters can cause the compressed air to rebound, so that the sooty air enters the cleaning chamber.
The connecting-piece (see photo 6) in the back wall of the cleaning chamber allows for constant ventilation of the cleaning chamber during the cleaning process.

When the rebounding of soot has stopped, the valve of the blow gun is opened completely, so that the actual cleaning process can begin.
During the cleaning process, the blow-nozzle (see photo 6) must be moved slowly and carefully over all of the filter's cells. Thereby, each individual cell is hit as directly as possible by the cleaning air.

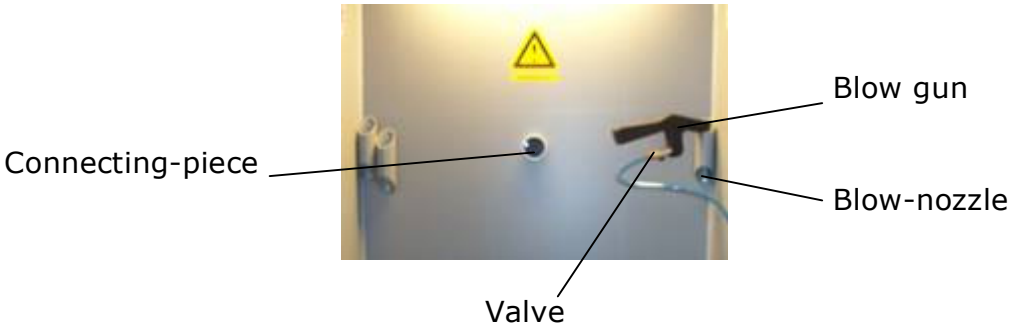


Photo 6

9.8 Cleaning effect

A decisive factor in the effect of the cleaning, is that all of the particle-filter's cell-channels have been exposed to direct hits from the pressure of the blow gun.
The effect of the blow process can be viewed in a small built-in mirror at the bottom of the cleaning chamber.
Soot blown off of a filter will be seen as a cloud coming out of the bottom surface-plate of the filter.
The filter is clean, when soot can no longer be seen coming out of the bottom surface-plate.

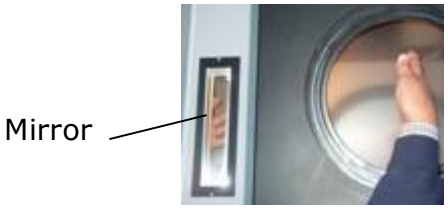


Photo 7

9.9 Concluded cleaning process

When the cleaning process is over, the blow gun's valve is closed.
The suction process is stopped by pressing the OFF button (see 7.4). By pressing the OFF button, the regeneration process of the cleaner's cartridge-filters is started (see 6.2).
After 30 seconds, the cleaned particle-filter can be taken out of the cleaning chamber by using the fixture-plate (see 9.4).

10. Operating Problems

10.1 Clogged cartridge-filters

The yellow light/alarm FILTER (see 7.5) on the operating panel is on.
The filter-cleaner's regeneration process (see 6.2) is no longer sufficient for releasing soot particles from the filters.
Repeat the regeneration process as described (see 10.2).
If particle-filters with fatty and oil-rich soot are cleaned, clogging of the cleaner's filters can occur very quickly.
If particle-filters of this type are cleaned frequently, it is possible to install a special type of cartridge-filter in the cleaner, which releases sticky particles easier. For further information concerning this please contact the dealer.

10.2 Repeat regeneration

It is possible to repeat the automatic regeneration process several times in a row.
Start suction process by pressing ON (see 7.3) and wait for a short time. Then stop the suction process again by pressing OFF (see 7.4) and wait 30 seconds until the regeneration process (see 6.2) has been completed.
Repeat the procedure several times in a row.

10.3 New cartridge-filters

If the yellow light/alarm FILTER (see 7.5) is on constantly, then it is time to replace the cartridge-filters.
There should always be two new filters in stock, ready to be installed (see 20).
New cartridge-filters are installed as described in 11.4.

11. Maintenance and Inspection

11.1 Full soot drawer

Larger soot particles are collected in the cleaner's built-in soot drawer (see photo 8).
The soot drawer is made of cardboard and is disposable.
It is important to check the contents of the soot drawer regularly. The simplest way of doing this, is by looking through the hole in the cleaning chambers suction-plate (see 9.5).
When the soot drawer is filled maximum two thirds, it must be replaced.

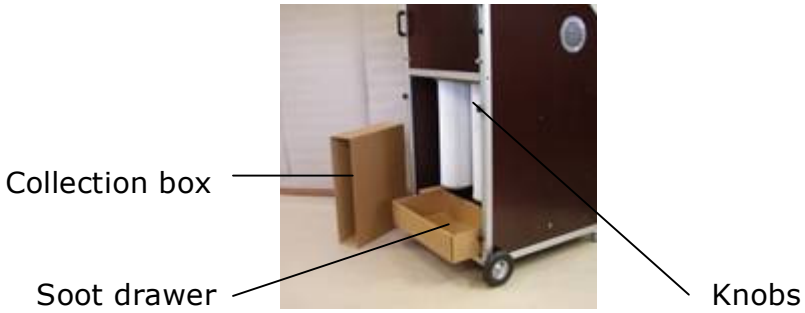


Photo 8

11.2 Replacement of soot drawer

Handling and replacement of the soot drawer must be done in accordance with the above mentioned safety measures (see 8).
Prepare a safe collection box (see photo 8) for the soot drawer in advance.
To acces the soot drawer, remove the hatch to the filter chamber on the backside of the cleaner.
Before removing the hatch, strike it a couple of times with your fist so as to knock off any soot stuck on the inside of it. Loosen thereafter the knobs (see photo 8) that secure the hatch.
The lid can now carefully be removed, so that the drawer is accessible.
Be careful of any soot still clinging to the inside of the hatch and to the moulding around the drawer, so as to avoid it falling on the floor. It is a good idea to place the hatch on a protective mat, that can be disposed of together with the soot drawer.
The drawer can now be removed and placed in the prepared collection box. The box is then carefully sealed with tape, whereafter it is ready for disposal (see 13).
A new drawer is then inserted. Always have new soot drawers and collection boxes (see 20) in stock, ready for use.
Finally, the hatch is replaced and the knobs tightened carefully.
In connection with replacement of the soot drawer, it is recommended that the drawer chamber be cleaned (see 11.3).

11.3 Cleaning of the drawer chamber

When the soot drawer is replaced, the drawer chamber should be cleaned (see 11.2).
Cleaning of the drawer chamber must be done in compliance with the above mentioned safety requirements (see 8).
With time, a small amount of soot build-up will occur along ledges and in the chamber.
Vacuum the chamber with a certified industrial vacuum cleaner. The vacuum cleaner must be connected to a central ventilation system leading out into the open.

11.4 Replacement of cartridge-filters

Replacement of the cleaner's cartridge-filters must be done in compliance with the safety requirements (see 8).
In order to acces the filter chamber (see photo 9), remove the hatch in the same way as described in 11.2.
With each new cartridge-filter a plastic bag is enclosed, which should be used to cover and seal used filters when replaced.
The plastic bag is carefully pulled over the cartridge-filter until it covers the filter, so that only the mounting-flange (see photo 9) is accessible.
Both cartridge-filters are sealed this way.
The three flange bolts, which secure each filter, are loosened enough to allow the mounting-flange to be turned free of the bolts and removed.
Both cartridge-filters are removed in this way and must be disposed of as described in 13.
New cartridge-filters are mounted on the flange bolts and tightened carefully.
Make sure that the tightening of the bolts is done evenly, and that the rubber gasket of the mounting-flange adheres closely to the filter-plate.

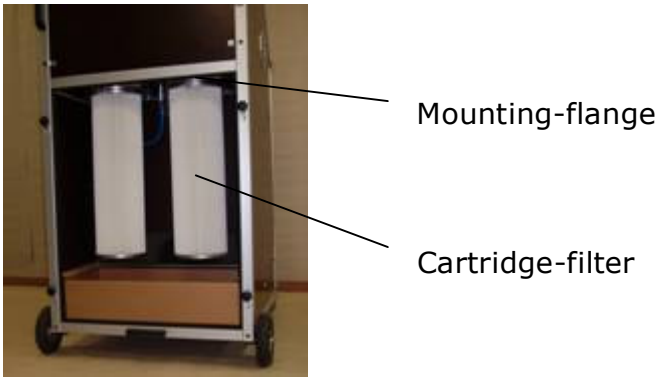


Photo 9

11.5 Filter-regulator

The built-in filter-regulator in the cleaner (see photo 10 + enclosure 22), must be inspected and serviced according to the frequency of cleaning and strain.
Sullying and the amount of condensed water also depends on the quality of the compressed air supply.
Initially, the filter-regulator must be inspected within the first three months of operation.
The lower hatch on the front side is removed to allow access to the regulator (see photo 10).
The screw at the bottom of the filter chamber is turned 90 degrees clock-wise and pushed up towards the regulator. This causes the container to be emptied of water and impurities. Hold a rag under when emptying.
After the emptying process the screw is turned back again.
Important! The filter-regulator is pressure-set by the manufacturer and this setting is under no circumstances to be changed.
The hatch is replaced and fastened.

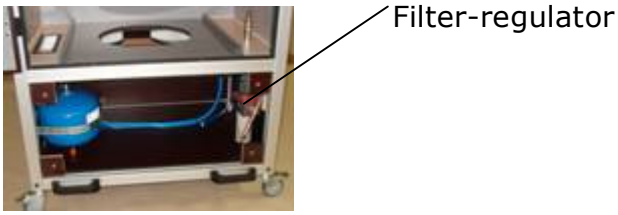


Photo 10

12. General Maintenance

12.1 Cleaning

Always use gloves and protective gear when cleaning and wiping off the cleaner.
Avoid use of wet and moist cleaning materials where soot particles are deposited.
Interior surfaces should be left untouched, as the soot particles only blacken the surfaces.
The light fixtures may carefully be wiped with a clean, dry cloth until light is optimal.
Exterior surfaces may also be wiped with a dry cloth. Stains are most efficiently removed with cleaning alcohol.
The inspection window can be cleaned inside and outside with a cloth and conventional window cleaner.
The glass over the mirror (see photo 9) in the suction chamber can be wiped carefully with alcohol or window cleaner, and the mirror is polished by sticking the hand under the suction-plate (see photo 4).
All cloths and cleaning materials must be disposed of as environmental waste (see 13).

12.2 Weekly

Inspect the amount of soot in the soot drawer (see 11.1) and replace, if necessary, the drawer as described in 11.2.
If necessary, clean as described in 12.1.

12.2 Monthly

Inspect the operating sleeves for wear and tear, and replace them if necessary with new ones (see 20).
Inspect the blow gun for leakage and wear and tear on the nozzle (see 20).

13. Disposal of Soot Drawer and Cartridge-filters

The soot drawer and the cartridge-filters contain particles damaging to ones health, which after incapsulation and sealing in connection with replacement and maintenance, must be handled and disposed of in accordance with regulations.
It is the producer of the waste who is legally responsible for handling and disposal in compliance with regulations.
If doubt should arise concerning handling of the waste, please contact the relevant authorities or branch organizations for further information about storage and disposal of the waste.

14. Service

The filter-cleaner has no components that are strained to the point of requiring special service or attention.
Depending on operation and strain, the fan must be inspected by qualified personnel, who can evaluate the physical condition of the components (see enclosure 22).
Nuts and bolts on the outside of the ventilator and motor panel must be tightened. This should be done after approximately 25 hours of operation or at least once yearly.

15. Warranty

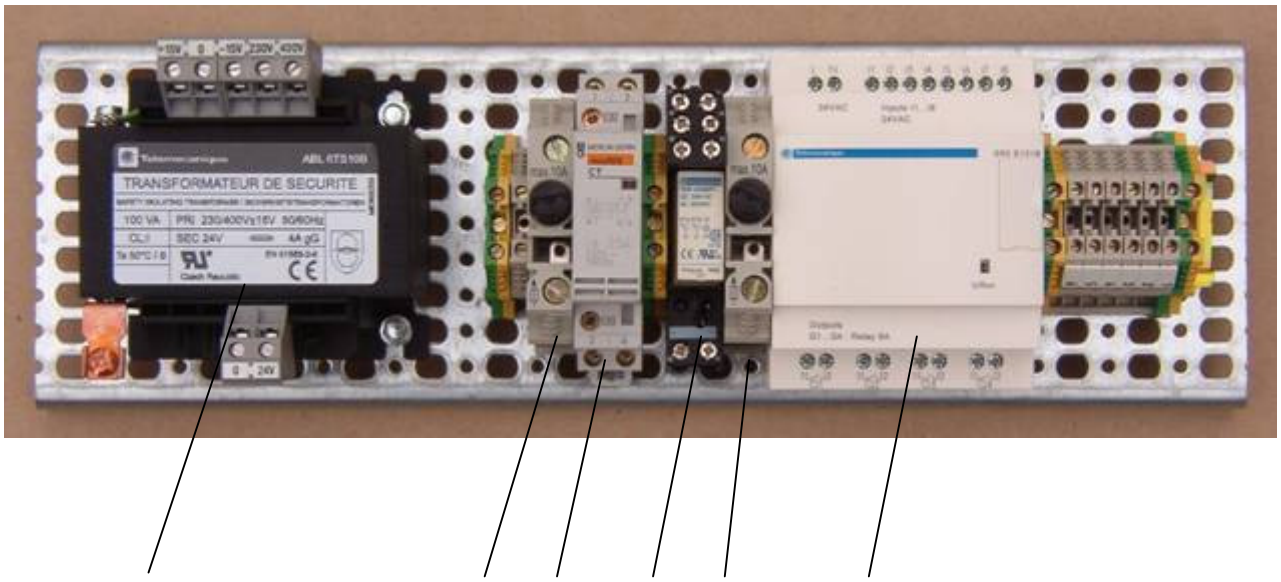
The filter-cleaner has a two-year warranty on material and production flaws.
The warranty is effective upon buyers reception of the cleaner.
Parts, covered by the warranty, that need to be replaced, are delivered free of charge to the customer.
Dismantling and re-installation are not covered by the warranty.
It is a prerequisite for the warranty, that the cleaner is handled and connected as described in 5.
The warranty does not cover damage caused by improper handling (see 2), such as cleaning of components other than particle-filters.
The warranty requires that instructions, maintenance, and service is done strictly in accordance with the manual.

16. Claims

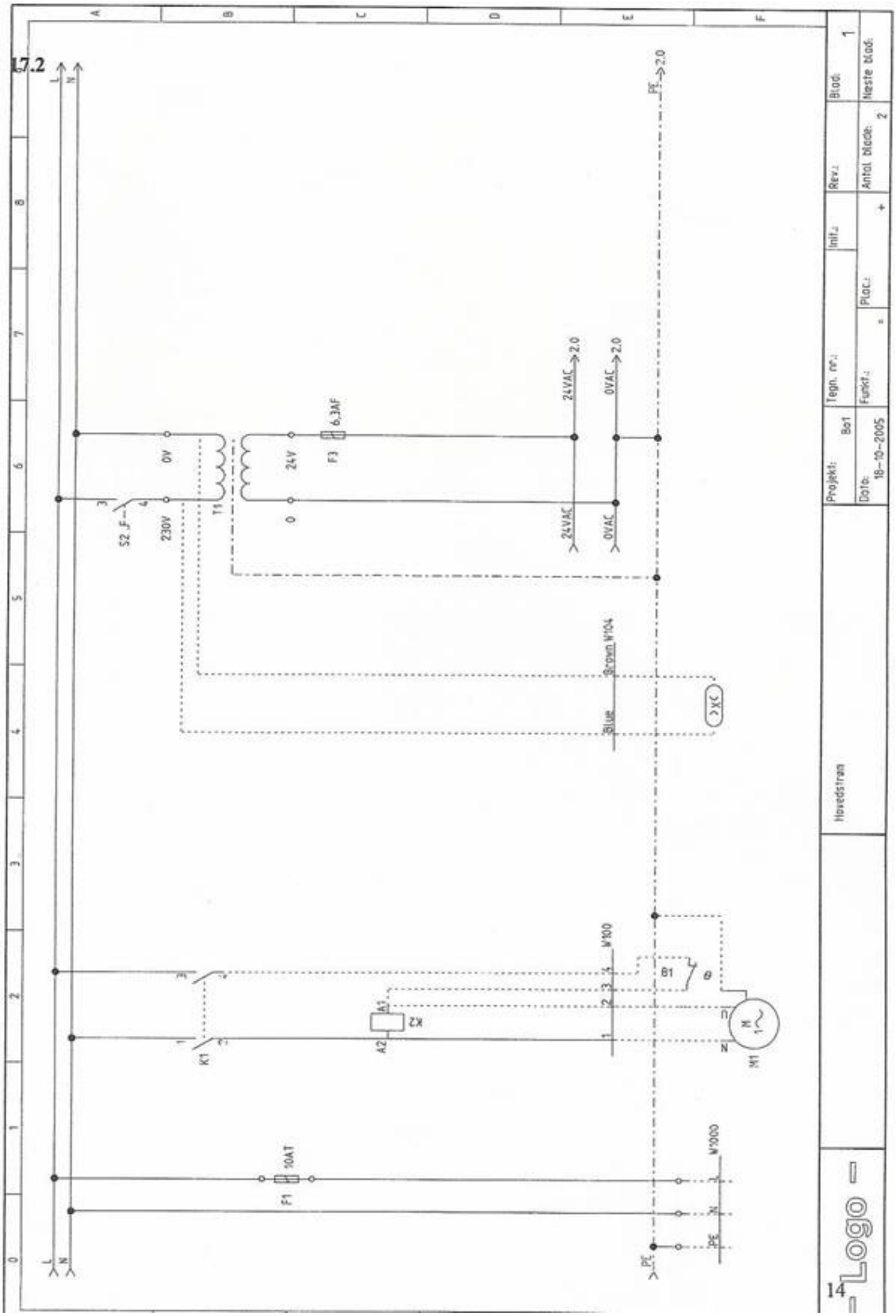
Claims covered by the warranty (see 15), must be reported immediately to the manufacturer.
Claims regarding the cleaning quality of particle-filters are beyond the responsibility of the manufacturer.

17. Electrical Installation

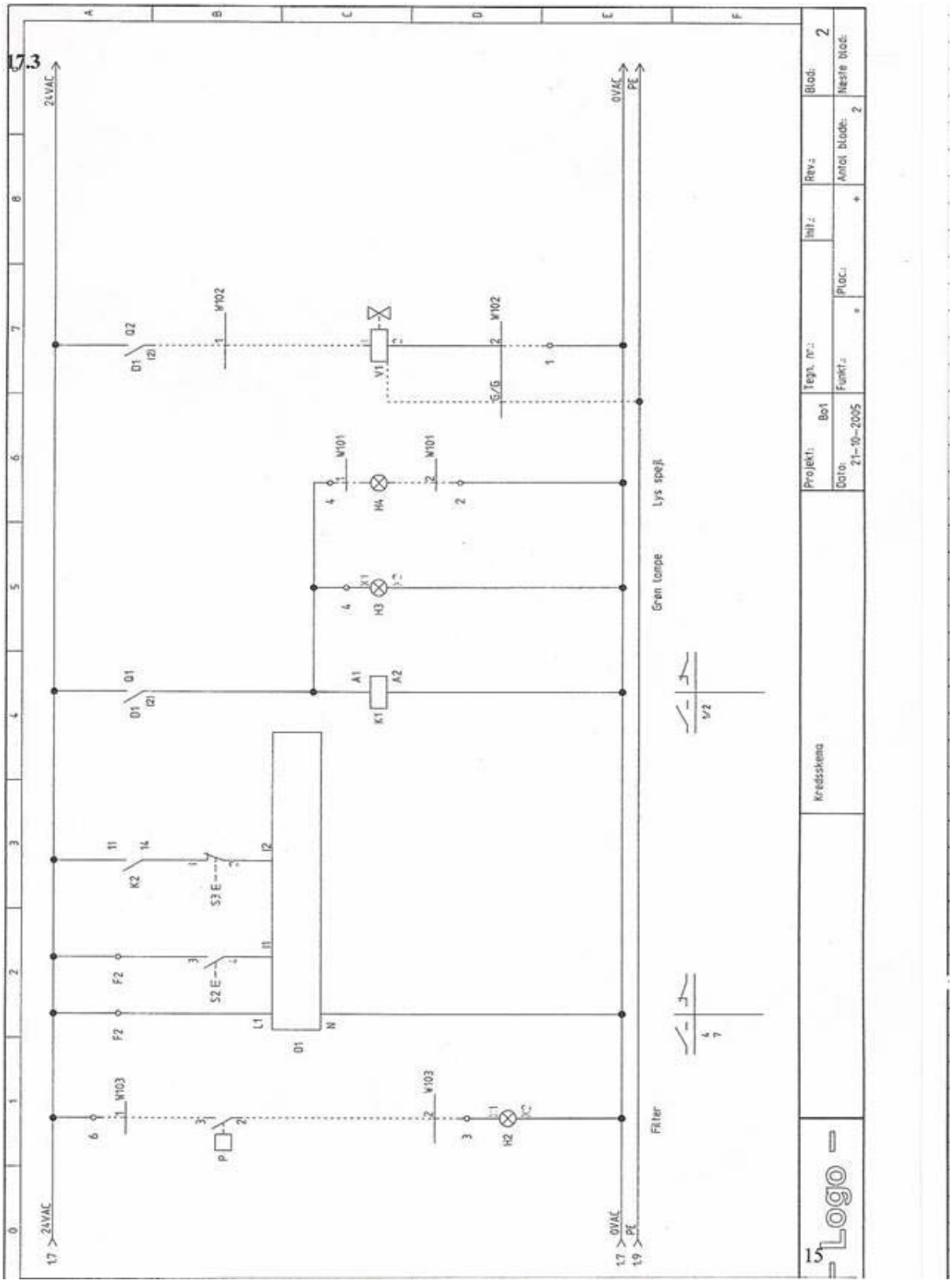
17.1 Component placement



17.2 Power


17.2
L
N
PE
0V
24V
230V
T1
F3
6,3AF
S2
24VAC
0VAC
2.0
Brown W104
Blue
2XC
W100
B1
K1
K2
A1
A2
M1
F1
10AT
W1000
Projekt:
Bo1
Tegn. nr.:
Funkt.:
Plac.:
Rev.:
Init.:
Antal blade:
2
Blad:
1
Næste blad:
Date:
18-10-2005
Hovedstrøm
=Logo
14

17.3 Circuit diagram

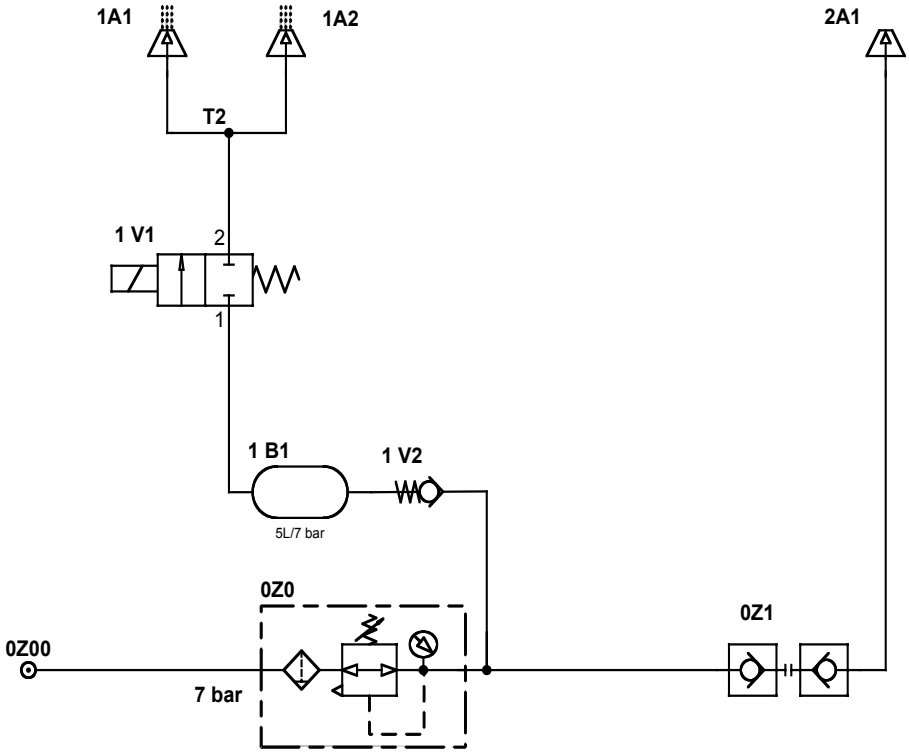


17.4 Electrical Component List

Placement	Article Text	No. of	Electrical no.
D1	Zelio without display	1	75 23 005 213
T1	Transformer 100VA P230-400/S 24V	1	75 62 300 050
F1 + F2	Fuse clip AB1FU10135U 5 + 20mm	2	75 21 009 758
K1	Contactor 2P 20A 24 16020	1	33 22 160 201
S3	Pressure XB4BA42 Plan Red	1	75 17 800 039
S2	Lamp pressure head ZB4BW333 Plan GR	1	75 17 907 265
S4	Lamp XB4BVb5 24 VAC/DC Yellow	1	75 17 800 398
S2	Lamp pressure body ZB4BW0B31 24V AC/DC	1	75 17 805 733
S1	Turn-switch XB4BD21 Short grip	1	75 17 800 055
K2	Plug-in relay with socket 2c/o 8A 230V AC	1	75 22 600 677
H1	Light fixture Luminestra 13W	1	56 46 001 057
H4	Halogen lamp 20W 24V G4	1	20 56 441 394
	Cable-plate	340mm	87 37 122 101
	(Din rail?) TS 35/F6 M/holes	200mm	57 21 500 143
F2	Fuse 6.3A 5x20 (Fast)	1	57 25 552 485
F1	Fuse 10.0A 5x20 (Slow)	1	57 25 552 867
	(Multiple clip?) ABI VV235U	7	75 21 007 899
	Ground clip ABI TP435U	3	75 21 010 404
	(Screwed Polya.?) M20 ø5 - 12	1	04 13 111 777
	Nut M20	1	

18. Compressed air

18.1 Compressed air diagram



	Ændring:	Dato:	Navn:
A	Oprettet	27-10-05	AH
B			
C			
D			

Betegnelse: F-104

Tegnings-nr.: MW-04-00107

METAL WORK DANMARK A/S
Korskildelund 1
2670 Greve
Tlf. 70222311
Fax. 70222759

18.2 Component specification

Specification

Placement-Diagram:	Description:	Order No.:	Other:	Number of:
1A1	Nozzle			1
1A2	Nozzle			1
2A1	Blow gun			1
1V1	2/2 NC	WE107CB1240		1
1V2	Counter valve	8111003		1
1B1	Compressed air tank	W0970600003		1
0Z0	Filter-regulator	3583008		1
0Z1	Quick coupling Quick coupling	0301202 0303205		1 1
1V1	**Reel** **Cable plug** **Fittings**	**W0217000011** **W097051001** **2001016**		**1** **1** **1**
1V2	Fittings	2001014		2
1B1	Fittings	2031019		2
0Z0	Wall fitting Manometer Fitting primary side Fitting secondary side	9400701 9700106 2001014 2032017		1 1 1 1
0Z1	Fitting primary side Fitting secondary side	2001014 2103003		1 1
0Z00	Air connection	2001014		1
T2	Fitting			

19. Spare Parts

Designation	Article no.	Comment
Tube light 13W	S104.001	
Halogen lamp 24v 20W	S104.002	
Holder for blow gun	S104.005	
Holders for blow pattern	S104.006	
Mirror	S104.010	
Viewing glass for mirror	S104.011	
Rubber wheel 200 x 50	S104.012	
Fitting for rubber wheel	S104.013	
Turnable apparatus wheel 75mm	S104.014	
Knobs	S104.015	
Transportation handle	S104016	
Fan incl. motor	S104.020	
Pressure guage	S104.021	

20. Accessories

Designation	Article no.	Comment	Dinex No.
Fixture-plate 1	T102.001	Filter diam. 194/165 mm	43003
Fixture-plate 2	T102.002	Filter diam. 259/216 mm	43004
Fixture-plate 3	T102.003	Filter diam. 330/310 mm	43005
Fixture-plate 4	T102.004	Filter diam. 412/360 mm	43006
Fixture-plate 5	T102.005	Filter diam. 458 mm	43007
Fixture-plate A	T102.006	Filter diam. 327/287 mm	43005
Fixture-plate B	T102.007	Filter diam. 345/370 mm	43006
Fixture-plate C	T102.008	Filter diam. 472 mm	43007
Blow pattern 25	T102.010	Diam. 250 mm	43010
Operating sleeves (2)	T102.015		
Buckles for sleeves (2)	T104.001	Ø 170 mm	
Cartridge-filters (2)	T104.005		43021
Blow gun	T104.010	Photo 6	
Nozzle pipe for blow gun (3)	T104.011		43002
Soot drawer and collection box (10 sets)	T104.015	Photo 8	43022
Filter-cart	T102.020	Photo 2	43020
Cardboard box for filter-cart	T102.021		43023