

Kit Part Number: 710943



Parts and Service Manual

CATERPILLAR

793F / 795F HAUL TRUCK

HEPA H14 Variable Speed Pressuriser | OnGuard Air Quality Monitoring and Control | HEPA Return Air Filter



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Controlled Document: M0455

Issue Date: 09/01/25

Revision: 1

INSTALLATION

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INSTALLATION OVERVIEW

Manufacturer	Caterpillar
Type	Haul Truck
Model	793F / 795F
Cabin Pressure Max	
Set Auto Cabin Pressure	



HEPA H14 Variable Speed Pressuriser



OnGuard Controller



HEPA Return Air Filter

SAFETY

WARNING

THE PRESSURISATION SYSTEM DESCRIBED IN THIS MANUAL HAS THE FOLLOWING AREAS WHICH MAY BE DANGEROUS IF NOT TREATED WITH GREAT CARE.

QUALIFIED STAFF MUST WEAR THE CORRECT PERSONAL PROTECTIVE EQUIPMENT WHEN CLEANING AND SERVICING THIS UNIT DUE TO DUST AND FIBRES WHICH MAY BE CAUGHT BY THE STAGES OF AIR FILTRATION DURING NORMAL UNIT OPERATION.

THE ELECTRICAL POWER SYSTEM IS SUPPLIED BY 12V DC OR 24V DC AND NO WORK SHOULD BE CARRIED OUT ON THE PRESSURISER SYSTEM WITHOUT THE CORRECT SAFE WORK PROCEDURES AND ELECTRICAL SAFETY MEASURES BEING TAKEN, AND ALL RELEVANT CIRCUIT BREAKER OPENED TO ISOLATE THE CIRCUIT.

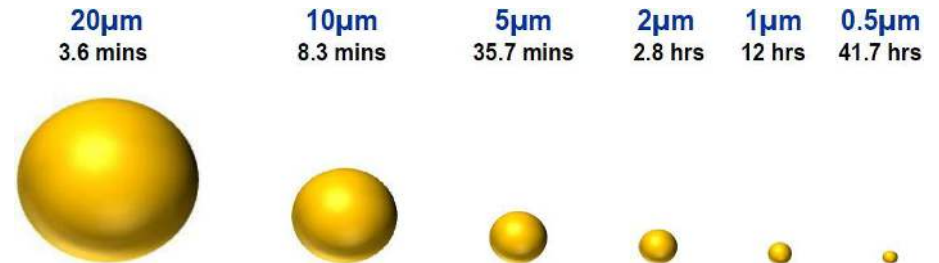
THE AIR FILTRATION SYSTEM MAY HAVE SEVERAL TYPES OF HIGH-SPEED ROTATING EQUIPMENT INSTALLED WITH VERY SHARP EDGES. ENSURE ALL SAFETY GUARD ARE IN PLACE WHILE THE SYSTEM IS RUNNING.

Please be aware that HEPA filters cannot be cleaned and must be replaced at the end of their lifecycle or if filter media has been damaged.



Particulate Behaviour

This is the length of time it takes for a particle to drop from a height of 1.5m in **STILL** air.



Warehouses and workshops do not have still air, so hazardous airborne particulates may remain in air for longer, increasing chance for workers to breathe in dust. Ensure PPE is worn when installing this system.



CRITICAL PARTS & MAINTENANCE SCHEDULE

Maintenance Schedule

The following tables show our suggested maintenance schedule for all units. Please note that site conditions may alter this. Excludes high corrosion environments.

Data download is required to claim the 3-year warranty on Brushless Blower Motor.

Inspect every 500 Hours and replace when filter is full*

Component / System	Action Required
Turbo Pre-cleaner	Check operation of the Turbo Pre-Cleaner.
Pressuriser Blower	Ensure blower is operational.
HEPA Primary Filter p/n: 500000	Inspect filter capacity indicator. Replace HEPA filter when 80% or greater. Vacuum out housing before replacing the filter elements.
HEPA Return Air Filter P/N: 500011	Vacuum inside cabin floor before replacing filter.
Filter Frame Assembly, Mounts, Seals and Filter Housing	Check door seals, all bolts, screws, and all mounts are secure. Check the filter canister & ensure it is correctly fitted. Check latches are operational and in good order. Replace / Re-tension fixtures and fittings required.

15,000 Hours / 36 months*

Component / System	Action Required
500 Hour Inspection	All 500-hour inspection actions.
Pressuriser's Blower 200002	Replace BRUSHLESS Pressuriser blower.

Critical Parts				
Item	Part Number	Qty.	Description	Service Interval
1	500000	1	HEPA H14 Fresh Air Filter (Tested as per EN1822)	1000* Hours (>80% fan capacity)
2	500011	1	HEPA Return Air Filter	500* Hours
3	200002	1	Brushless Blower Motor – 24V	15,000 Hours
4	200510	1	OnGuard TS User Interface inc. CO ₂ & PM Sensor	
5	200361	1	OnGuard Main Unit Active	
6	200368	1	OnGuard Sensor Pod (Optional)	

*Filter service hours are subject to cab sealing efficiency, site conditions and correct system use.

Suggested Schedule Servicing*

2024-06-11 12:30:43		
Pressure:	+50 Pa	⚙️
Motor:	28 %	⚙️
CO ₂ :	631 ppm	☀️
PM ₁₀ :	2.1 µg/m ³	
TWA PM ₁₀ :	1.5 µg/m ³	

Fan Capacity Indicator

The filter is serviceable if the motor capacity is between 10% & 80%. We recommend that the filter is changed if the capacity is over 80%.

*Site dependent

OPERATOR GUIDE

OPERATORS CHECKLIST

PRE-START

1. Visually inspect the pressuriser, ducting, mounting brackets, and return air filter assembly.
2. Visually inspect the cabin for any damage to doors, windows and seals.
3. Please remove dust & debris from shoes and clothes before entering the cabin.
4. Ensure door(s) and windows are closed correctly.
5. Start engine and turn HVAC blower to mid speed or greater.
6. After automatic pressure test, the BreatheSafe display will show 50 Pascals or pre-set value.

The system is working correctly when the pascal value is green.
>> There is no further action required <<

ALERTS

No Air Pressure

Pressure warning has persisted and system has escalated warning to an alert. Check cabin sealing, outside pressure tube is connected to unit and not kinked or blocked, pressuriser is powered and running, and ducting from pressuriser to cabin is connected and undamaged.

Very High CO₂ Level

Critical alarm threshold for CO₂ level reached. System will temporarily increase fresh air intake to reduce CO₂ concentration. Ensure OEM air conditioning fan is set at mid-speed or greater to circulate air around the breathing zone and minimise CO₂.

High Dust Level

High dust load detected inside the cabin. System will temporarily flush enclosure with filtered air. Close doors and windows. Check filter is installed correctly, and ducting is not damaged.

Sensor Not Detected

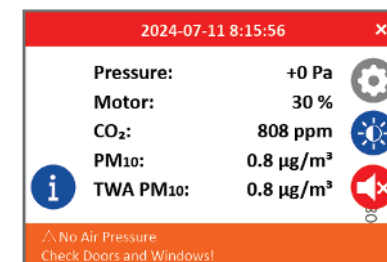
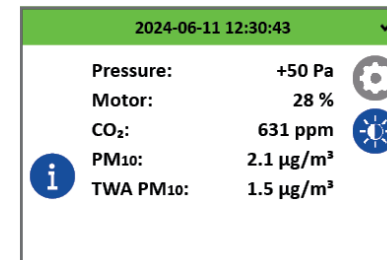
Unit failed to detect sensor pod. Check sensor pod cable is securely connected to the unit and sensor pod. Restart unit, and replace sensor pod if alert persists.

Sensor Fault

Unit has detected a sensor pod fault. Ensure airflow to sensor pod is not blocked or obstructed. Replace sensor pod if alert persists.

No Air Pressure

Pressure loss warning has persisted for longer than 2 minutes. Check cabin sealing, outside pressure tube is connected to unit and not kinked or blocked, pressuriser is powered and running, and ducting from pressuriser to cabin.



Specifications High-Capacity HEPA Pressuriser

Blower	: Brushless Blower P/N 200002.
Protection	: Locked Rotor Protection (Sub Zero Environments) Under Voltage, Under/Over Current & Over Temperature.
Voltage	: 24VDC.
Current Draw	: 11 amps (peak). *Note: Motor has slow start to stop excessive in-rush current.
Air Flow	: Up to 30-300 m ³ /h or 50-215 CFM.
Pre-cleaner	: Integrated VLR (Very Low Restriction). Turbo Pre-Cleaner.
Filter Element	: BreatheSafe HEPA Primary Filter (H14=99.99% MPPS) TESTED AS PER EN1822 – P/N 500000.
Plugs & Fittings	: Mining Spec. Deutsch electrical plugs as standard.
Construction	: High strength composite construction.
Serviceability	: Easy access HEPA filter with twist-lock (TL) dust cap single assembly.
Mounting	: Heavy Duty adjustable mounting brackets.
Design	: Fully designed in SolidWorks 3D CAD & Ansys Engineering Simulation Software.
FEA Testing	: Critical components FEA (Finite Element Analyst) tested in Solid Works Simulation.
CFD Testing	: CFD (Computational Fluid Dynamics) simulations in Flow Works to ensure optimum air flow through the system.

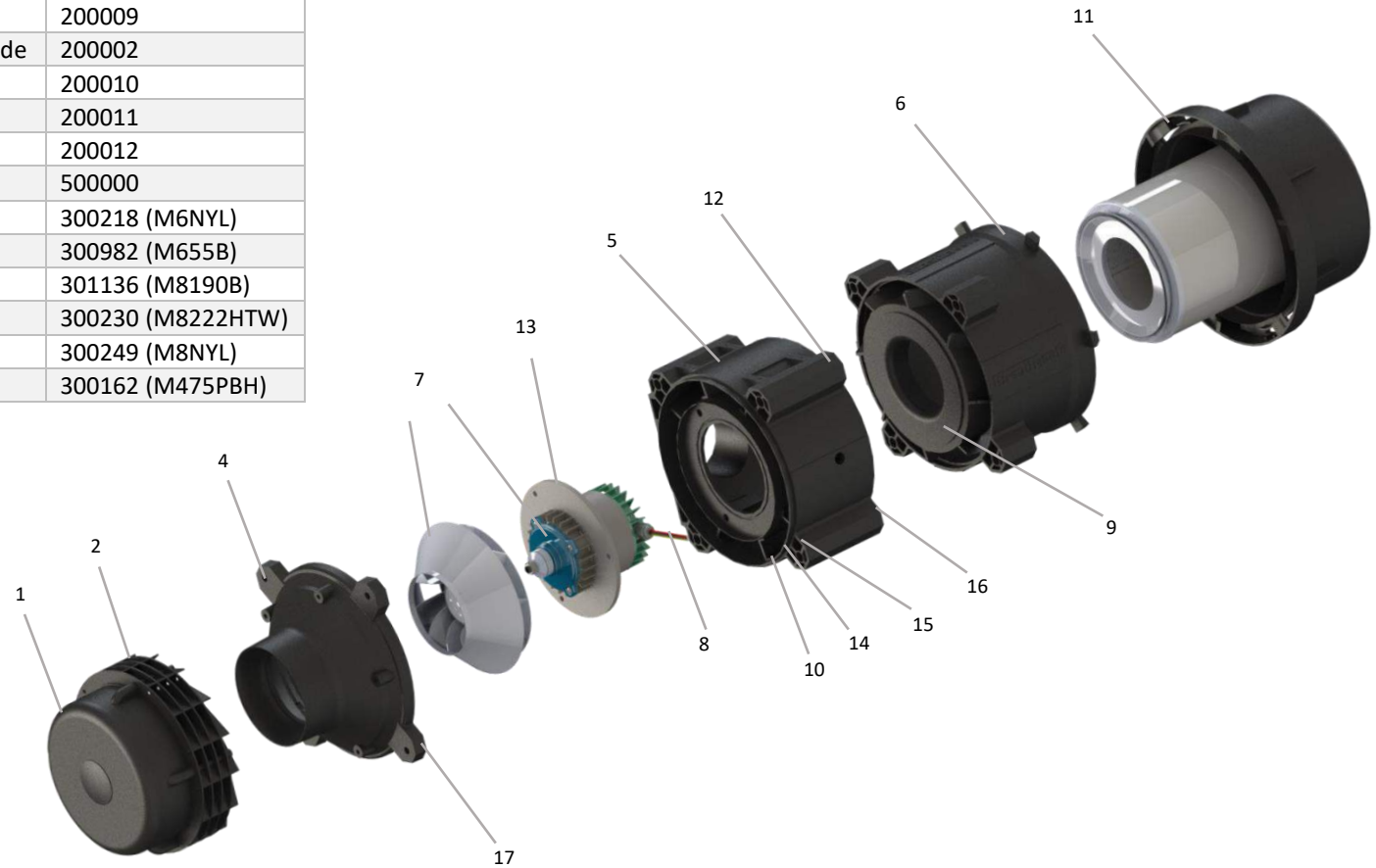
SPECIFICATIONS HIGH-CAPACITY HEPA PRESSURISER

List of Abbreviations	
DH	Dual HEPA
DHPR	Dual HEPA Powered Recirculation
DHAC	Dual HEPA Activated Carbon
DHACPR	Dual HEPA Activated Carbon Powered Recirculation
CPM	Cabin Pressure Monitor
CPU	Central Processing Unit
DB	Decibel Sensor
DPM	Diesel Particulate Matter
GAS	Gas Sensor
HEPA	High-Efficiency Particulate Air Filter
HPAFU	High Pressure Air Filtration Unit
HRAF	HEPA Return Air Filter
HVAC	Heating Ventilation and Air Conditioning
MAF	Mass Air Flow
OEM	Original Equipment Manufacturer
PM	Particulate Mass
RH	Relative Humidity
TEMP	Temperature
TS	Touch screen
UI	User Interface
VMS	Vehicle Monitoring System
VS	Vibration Sensor
OGSP	OnGuard Sensor Pod
CO2s	CO2 Sensor INPRESS TS

Item No.	Qty.	Description	Part No.
1	1	Pre-cleaner Hood & Rotor Assy	200004
2	4	Pre-cleaner Injector Ring	200005
3	1	TL Fan Blade (inc. in #7)	200006
4	1	TL Nose Cone / Pre-cleaner	200007
5	1	TL Motor Housing	200008
6	1	TL Filter Housing	200009
7	1	24v DC Brushless VSD Motor & TL Fan Blade	200002
8	1	O Ring Seal Kit 2 Parts	200010
9	1	Included in 8	200011
10	1	Wiring Sleeve	200012
11	1	HEPA H14 Filter	500000
12	3	M6 Nyloc Nut	300218 (M6NYL)
13	3	M6 x 55mm Hex Bolt	300982 (M655B)
14	4	M8 x 190 Hex Bolt	301136 (M8190B)
15	8	M8 x 22mm O/D HD Washer	300230 (M8222HTW)
16	4	M8 Nyloc Nut	300249 (M8NYL)
17	5	M4 x 75mm Pan Head Phillips Screw	300162 (M475PBH)

PARTS LIST – 24V DC PRESSURISER UNIT

PRESSURISER ASSEMBLY No: 200000

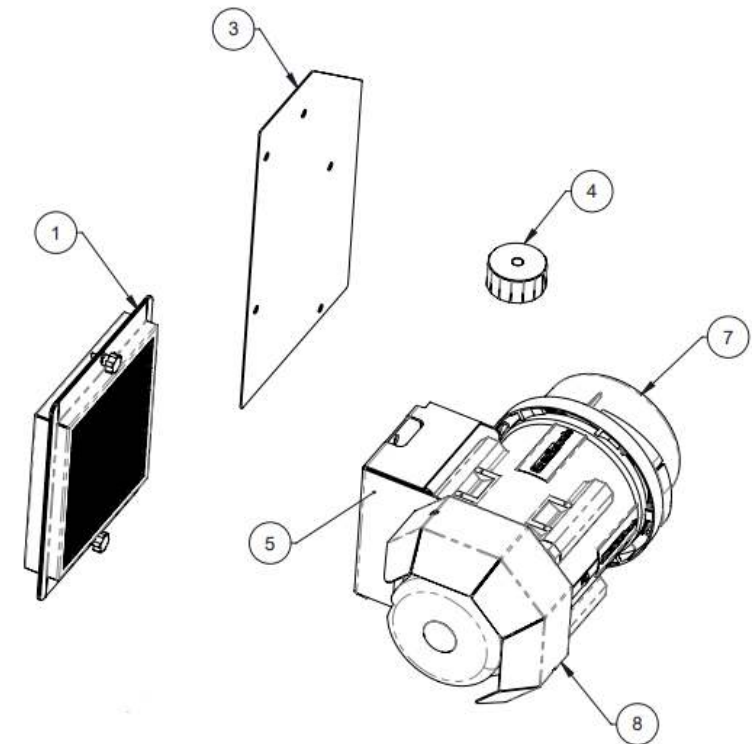
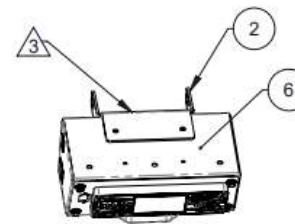


Item No.	Part No.	Rev	Description	Qty	Colour	Category
1	08035	4	Return Air Filter Assembly	1	Black Satin 27219268	Assembly
2	07445	2	INPRESS Mount Bracket	1	Black Satin 27219268	Part
3	11326	1	TL, SO2 Blanking Plate	1	Black Satin 27219268	Part
4	250520	[*]	Ø76 Tube Slip Cap	1	(As Req'd)	Stock Item
5	250005	0	CAT 793F TL Mount	1	(As Req'd)	Stock Item
6	250101	[*]	Monitor Box, Large	1	(As Req'd)	Stock Item
7	200000	[*]	HPAFU 24VDC VSD TL4	1	-	Stock Item
8	250068	1	TL WC Guard Short with Spacer	1	(As Req'd)	Stock Item
9	300852	-	76 ID Silicone Hose @58L	1	-	Pipework
10	300001	-	65-89mm Hose Clamp	2	-	Pipework

PARTS LIST GA

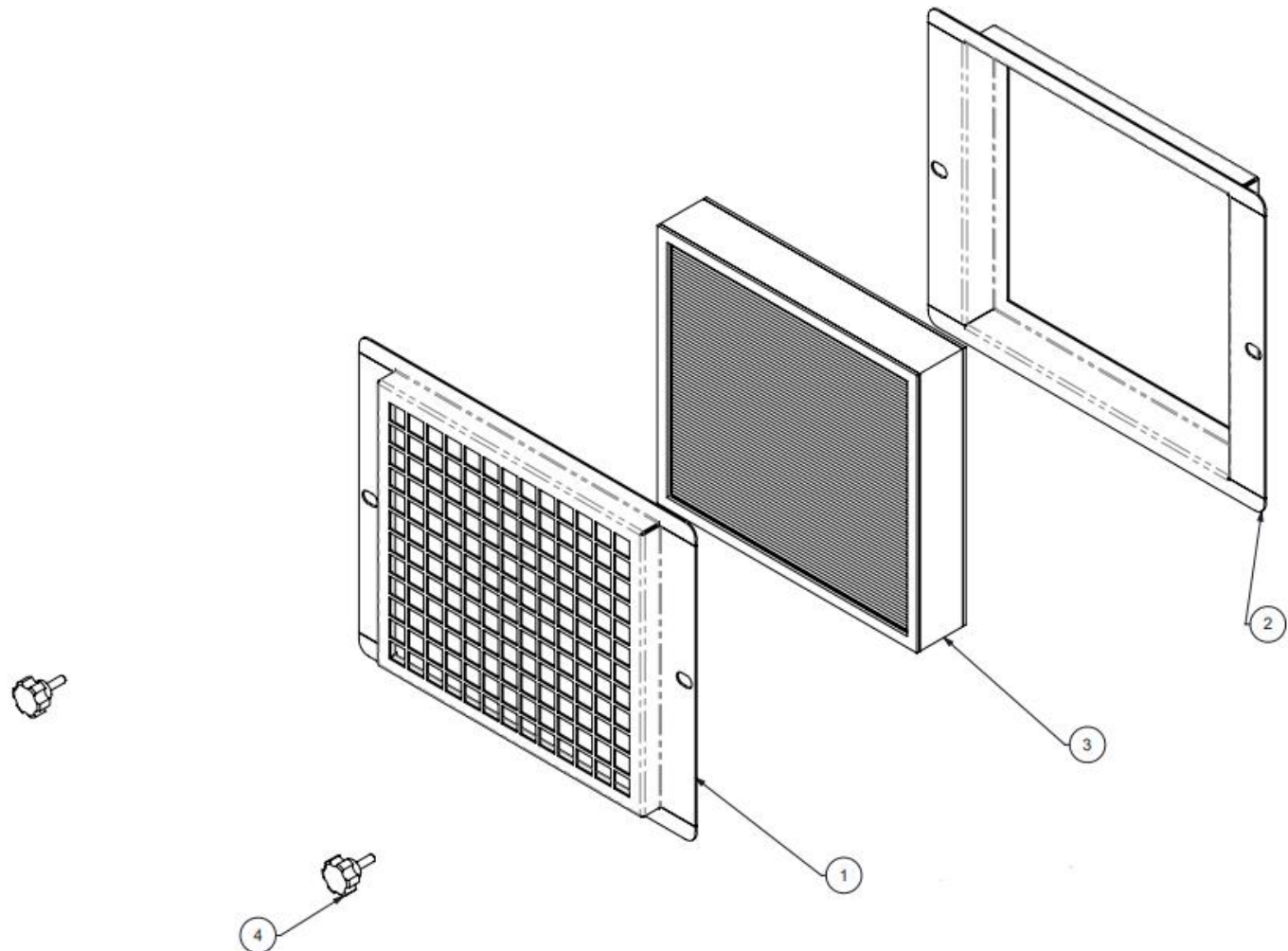
COMPLETE ASSEMBLY No: 710943

Kit Part Number: 710943



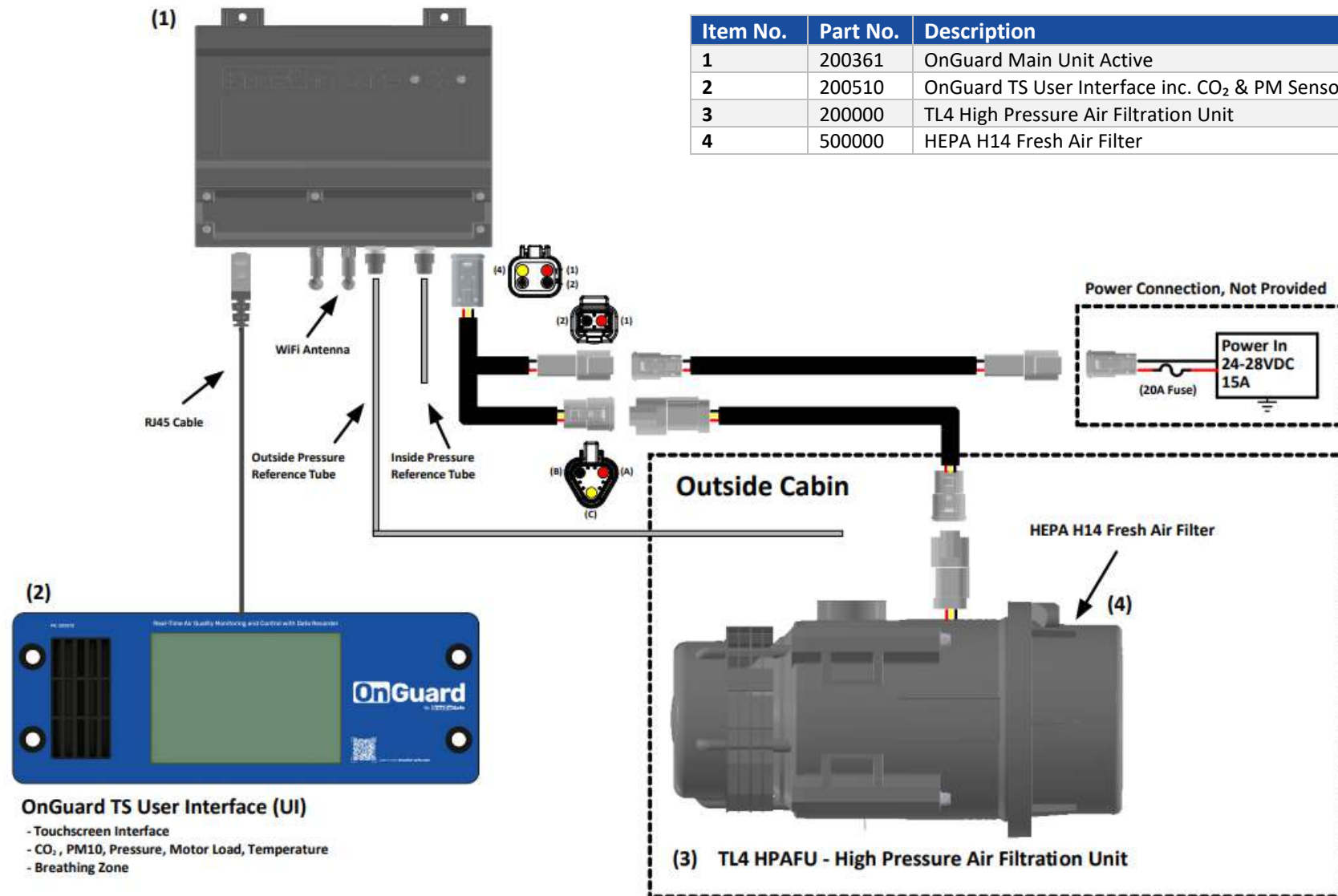
Item No.	Part No.	Rev	Description	Qty	Material	Thickness	Colour	Category
1	08036	1	Filter Cover	1	Zan	1.55	-	-
2	08037	1	Filter Housing	1	Zan	1.55	-	-
3	500011	0	HEPA Filter Assy 270 x 250 x 51	1	N/A	-	-	-
4	300814	-	M6 x 20 Male Scallop Knobs	2	-	-	-	-

PARTS LIST – RETURN AIR MODULE



Wiring Diagram

TECHNICAL DETAILS



Item No.	Part No.	Description	Qty
1	200361	OnGuard Main Unit Active	1
2	200510	OnGuard TS User Interface inc. CO ₂ & PM Sensor	1
3	200000	TL4 High Pressure Air Filtration Unit	1
4	500000	HEPA H14 Fresh Air Filter	1

*** Do not handle until MSDS & all safety precautions have been read and understood. Use personal protective equipment as required.**

Before use, carefully read the product label. Safe work practices are advised to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking, and smoking in contaminated areas. Avoid inhalation. Mechanical extraction ventilation is recommended when the removal of atmospheric contaminants is required. Maintain dust / fume levels below the recommended exposure standard. For small amounts, absorb with sand, vermiculite or similar and dispose of at an approved landfill site.

WARNING	
For Professional Use Only – keep out of reach of children.	
Do not ignite near or around flammable materials.	
Use only in well-ventilated areas, outdoors, and/or with proper respiratory protection.	
Persons with respiratory sensitivity should avoid exposure to any smoke.	
Concentrated smoke may cause severe burns to the skin, eyes, or respiratory system.	
Improper use may result in sufficient inhalation of smoke to cause respiratory tract irritation and lung damage.	
Harmful if swallowed.	
DANGER	
Use only as directed. Do not handle until all safety precautions, including Safety Data Sheet, have been read and understood. The product contains hexachloroethane. Wear protective clothing. If exposed or concerned, get medical advice. Store in a cool, dry, secure location. KEEP OUT OF REACH OF CHILDREN. Dispose of contents/container per location regulations. When used as directed, exposure should be limited and usually poses no hazard because the hexachloroethane is consumed inside the tube as smoke is produced.	
Directions: (Smoke Bomb)	
1	Ensure other workers in close proximity are informed of use. Place on a non-combustible container, away from flammable materials.
2	Place at Blower intake, or upwind of target area, or near centre of space.
3	Orient "Smoke Issues Here" toward air stream, away from surfaces. Place candle on a flame / heat resistance plate – if not it will melt into the plastic surface.
4	Ensure smoke will not create any hazard where it is anticipated to go.
5	Ignite emitter inside the cabin using site approved device i.e., solder torch or 'lighter' and conduct smoke test.
6	Do not touch or hold smoke generator after ignition – item becomes very hot & remains hot after use.
Smoke Emitter Cabin Pressure Leak Test	
1	The pressuriser system is switched on (TEST MODE).
2	Hold the smoke emitter angled down.
3	Ignite emitter using site approved ignitor i.e., solder torch or 'lighter'.
4	When the product ignites, remove the lighter.
5	If the product flames up, blow out the flame.
6	Place the emitter in a non-flammable container and place it inside the cabin at floor level and close the door/windows.
7	Observe smoke leaks to indicate worn-out or broken seal locations. Check leakage points outside the cabin.
8	Do not come into contact with or inhale smoke haze.
9	Wait until the smoke haze completely disperses before re-entering the cabin. Open door to allow sufficient ventilation of smoke prior to entering cabin.

SMOKE EMITTER CABIN PRESSURE LEAK TEST

Link to MSDS: [SMOKE GENERATOR TQ7621AT30S.pdf](#)

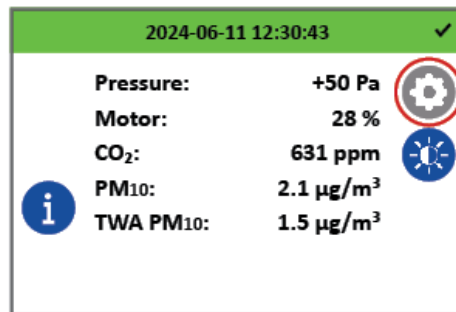
Personal Protective Equipment (PPE)	
	Safety glasses must be worn at all times.
	Sturdy footwear with rubber soles must be worn.
	Respiratory protection devices may be required.
	Gloves may be worn.
Pre-Operational Safety Checks	
	Locate and ensure you are familiar with all machine operations and controls.
	Check work area and walkways to ensure no slip/trip hazards are present.
	Ensure the work area is clean and clear of any flammable material & fire extinguish device is present.
Operational Safety Checks	
	Ensure the machine is correctly isolated / immobilized.
	Ensure other persons do not inhale smoke haze.
	Take care and do not place a lit emitter close to a flammable surface.
Ending Operations and Cleaning Up	
	Leave the work area in a safe, clean, and tidy state.
Potential Hazards	
	Falls
	Fumes
	Fire
	May cause cancer
Exposure is highly unlikely when the product is used as directed. Direct contact with the product does not occur.	
Don't	
	Do not use if an open flame is forbidden.
	Never leave the emitter [cabin test] unattended.

*This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to compliment training and as a reminder to users prior to equipment use.

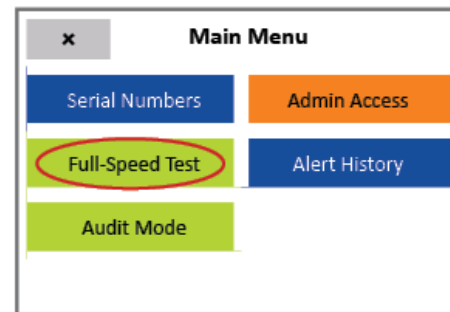
CABIN SEALING TEST PROCEDURE

Cabin Sealing Efficiency Test Procedure

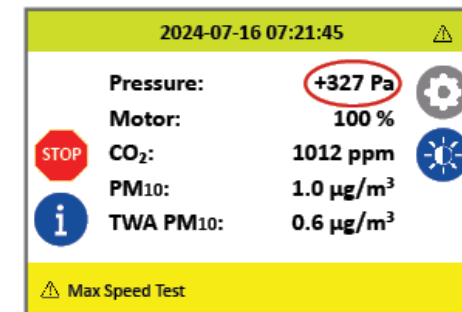
- 1 New replacement filter is required to perform this check. Start engine (pressuriser ON) and ensure all windows & door(s) are CLOSED correctly (no cabin pressure leaks).



Press the Settings cog.



Press "Full-Speed Test" button.



Cabinet sealing needs to be checked and improved if maximum pressure is below 250 Pa with a new filter.

Commissioning Procedures

Step One:

Access the commissioning form via the following link or scan the QR code:

<https://cthree.breathe-safe.com/coregform>

Step Two:

Carry out commissioning procedure correctly and collect required results.

- System Check Guide:
- Start engine (pressuriser ON) and ensure all windows & door(s) are CLOSED correctly (no cabin pressure leaks).
- Take a photograph of the pressure reading on the UI while the Full-Speed Test is running.
- Press settings and “Cancel System Check” to end the test.

Cabin sealing is an integral part of RS20 & ISO 23875; you must ensure that cabin seals are adequate for maintaining positive pressure. In addition, the site (end-user) must have the correct procedure(s) for servicing operator enclosure seals in a proactive manner rather than reactive. Items such as door and window seals must be in good working order or new seals fitted before the BreatheSafe system installation. The minimum BreatheSafe requirement for cabin sealing efficiency is 250 pascals; if this result is not met, it is essential to re-examine and find pressure leaks of the enclosure and apply new sealing measures.

Step Three:

Fill out the commissioning form on the BreatheSafe website.

Step Four:

- Upload the following required commissioning images:
- Job Sheet with Receiver’s Signature
- Whole Machine (Showing Pressuriser)
- Mounted Pressuriser
- Return Air Filter Label
- Return Air Filter Installation
- Pressure Test Result
- Actual Pressure and Motor Load
- Commissioning Sticker
- Machine S/N Plate
- Engine Hours / Odometer

Step Five:

- Fill in the BreatheSafe service tag with the following details:
- Machine serial number and installers details
- Date installed and “Full-Speed Test” result (max cabin pressure)
- The set cabin pressure with actual pressure and motor percentage output
- Verify the 250 pascal threshold was achieved = pass OR not achieved = fail**

Please upload machine and installation details in conjunction with the required images. A Commissioning Certificate will be sent to the email address you nominate. **Extended warranty for (RS20 & ISO 23875) BreatheSafe systems is only applicable to operator enclosures meeting this requirement.

COMMISSIONING PROCEDURES – CABIN PRESSURISER

INPRESS TL WARRANTY

Express Warranty

All BreatheSafe products carry a warranty against defects in materials or workmanship, provided the defects are not from factors outside of BreatheSafe's control (including neglect, lack of maintenance, improper installation or operation, unauthorized servicing repair, etc.). BreatheSafe will replace goods defected in material or workmanship at our Queensland factory or designated branch*. All parts deemed as failed or faulty must be returned to BreatheSafe for evaluation unless otherwise stated in writing.

Note- Systems must be installed and commissioned as per BreatheSafe installation and commissioning instructions. Once commissioned, the online commissioning sheet must be filled in, extending the components warranty as below. In addition, the system must be serviced and maintained correctly and by trained and qualified personnel. This requisite includes BreatheSafe technicians, qualified automotive air-conditioning technicians, or qualified auto electricians.

Warranty period – Standard

- 1 year or 10,000 hours (whichever occurs first).
- Controllers – 1 year no extended warranty option.
- Warranty Period Extension when commissioning documents are registered online within 28 days of installation
- Extended warranty** only offered if commissioning maximum pressure test reaches at least 250Pa.
- Brushless motor fixed speed two years, or 10,000 hours (whichever occurs first).
- Variable speed brushless motor 15,000 hours, or 3 years** (whichever occurs first).

Must be supplied with a variable speed pressure controller, data download required for 3-year warranty option. Link to online Commissioning and Extended Warranty Registration form <https://www.breathe-safe.com.au/commission/>

What is not covered under Express Warranty?

- Failures are due to incorrect application.
- Damage resulting from neglect, misuse, lack of maintenance, improper installation, or operation, inappropriate or abnormal use, accidental or unauthorized servicing repair.
- Failures are due to parts not being sold or approved by BreatheSafe.
- Failures arising from any other cause that is not directly related to a defect in material or workmanship.

This Express Warranty is VOID if the product is altered, modified, or used in the manner it was not designed for, also including unauthorized repairs, or using maintenance and repair parts other than those supplied by BreatheSafe.

BreatheSafe responsibilities

If there is a defect in material or workmanship not caused by the excluded failures during the warranty period, BreatheSafe will either replace the defective goods at our Queensland factory, or designated branch. *

Alternatively, BreatheSafe may elect to provide new replacement parts, BreatheSafe approved repair parts or assembled components needed to repair the defect. BreatheSafe reserves the right to provide a refund of the purchase price in lieu of replacement or repair at BreatheSafe's discretion. The replacement or repaired product will be sent to you freight prepaid by the customer or made available for pick-up on site.

Users Responsibilities

The customer should ensure that the system is maintained according to BreatheSafe service requirements and only authorized parts must be used to service and maintain BreatheSafe systems. In the event of a suspected warranty claim, BreatheSafe should be contacted in the first instance to arrange the repair or to assist with diagnosis. Claims should be made within one week of the repair.

After contacting BreatheSafe, you may be required to deliver or send the parts to BreatheSafe's Queensland factory or designated branch. * Link to online Warranty claim form <https://www.breathe-safe.com.au/warranty/>

Exclusion and Limitations on Damages and Remedies

This warranty is provided in lieu of all other warranties, written or oral, whether expressed by affirmation, promise, description, drawing, model, or sample. To the extent allowed by law, all warranties other than this warranty, whether express or implied, including implied warranties of fitness for a particular purpose, are disclaimed. The maximum liability of BreatheSafe under this warranty shall not exceed the original purchase price of the product. Interference with the equipment by or abuse, or by operating the equipment at ambient temperatures or with electrical power characteristics outside the ranges indicated in our specification shall be excluded from this warranty, as shall consequential damages.

Excluded from any express warranty are costs incurred in relation to service outside our factory our designated service branch, including traveling time, waiting time, transport costs, mechanical and overtime payments required. As per Australian Consumer Law: You are entitled to choose a refund or replacement for major failures with goods. If a failure with the goods or service does not amount to a major failure, you are entitled to have the failure rectified in a reasonable time. If this is not done, you are entitled to a refund for the goods and to cancel the contract for the service and obtain a refund of any unused portion. You are also entitled to be compensated for any other reasonably foreseeable loss or damage from a failure in the goods or service.

***This express warranty gives you specific legal rights, and you may also have other rights that vary from country to country.**