

# CATERPILLAR EHVC HAUL TRUCK 796AC ELECTRICAL CABINET



## Parts and Service Manual

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Kit Number: 720007

Controlled Document: M0448-2

### INSTALLATION

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#### INSTALLATION OVERVIEW

<b>Manufacturer</b>	Caterpillar
<b>Type</b>	Truck
<b>Model</b>	796AC
<b>Cabin Pressure Max</b>	
<b>Set Auto Cabin Pressure</b>	



**EPA E11 Variable Speed Pressuriser**



**OnGuard Air Quality Monitoring & Control**

## 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 breakers opened to isolate the circuit.

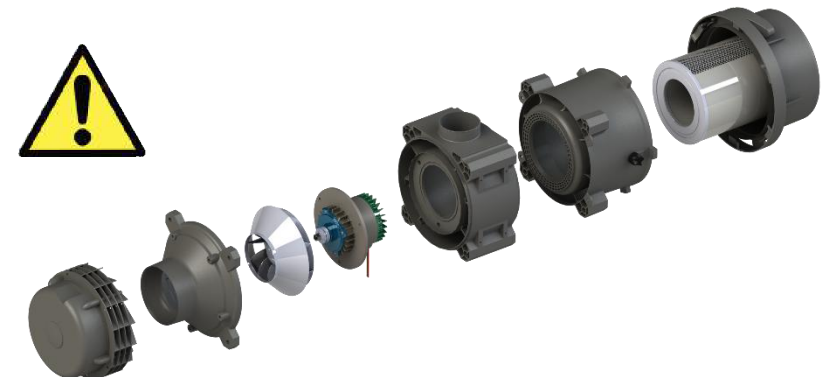
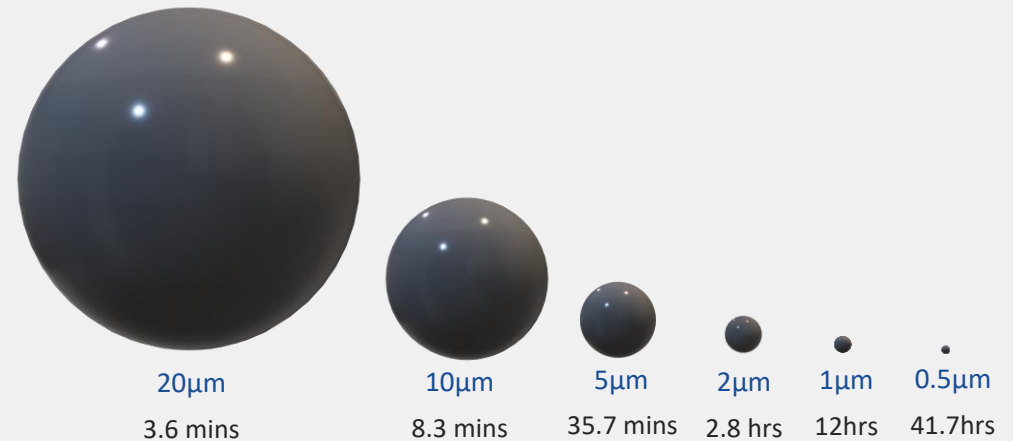
The air filtration system may have several types of high-speed rotating equipment installed with very sharp edges. Ensure all safety guards are in place while the system is running.

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



### 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 1000 - 2000 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.
EPA E11 Primary Filter p/n: <b>510095</b>	Inspect filter capacity indicator. Replace EPA filter when 80% or greater. Vacuum out housing before replacing the filter elements.
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 <b>200002</b>	Replace BRUSHLESS Pressuriser blower.

Critical Parts				
Item	Part Number	Qty.	Description	Service Interval
1	510095	4	Fresh Air EPA E11 Filter (Tested as per EN1822)	2000* Hours (80% fan capacity)
2	200002	4	Brushless Blower Motor – 24V	15,000 Hours
3	200604	1	OnGuard Air Quality Monitoring and Control with Data Recorder (Touch Screen)	-
4	200361	1	OnGuard Main Unit Active	-
5	200368	1	OnGuard Air Quality Sensor (Sensor Pod)	-

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

#### Suggested Schedule Servicing\*

##### 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 BreatheSafe system for any damage.
2. Visually inspect the cabinet for any damage to doors and seals.
3. Ensure doors are closed correctly.
4. System will activate with ignition.
5. Startup system and check screen for alarms or alerts.
6. Check pressure reading corresponds to value set on commissioning sticker.

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

#### NORMAL OPERATING CONDITION

Acceptable operating range for BreatheSafe fan 10-80%. >80% recommend maintenance.

### Specifications High-Capacity EPA 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 <sup>3</sup> /h or 50-215 CFM.
Pre-cleaner	: Integrated VLR (Very Low Restriction). Turbo Pre-Cleaner.
Filter Element	: BreatheSafe EPA E11 Primary Filter TESTED AS PER EN1822 – P/N 510095.
Plugs & Fittings	: Mining Spec. Deutsch electrical plugs as standard.
Construction	: High strength composite construction.
Serviceability	: Easy access EPA 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.

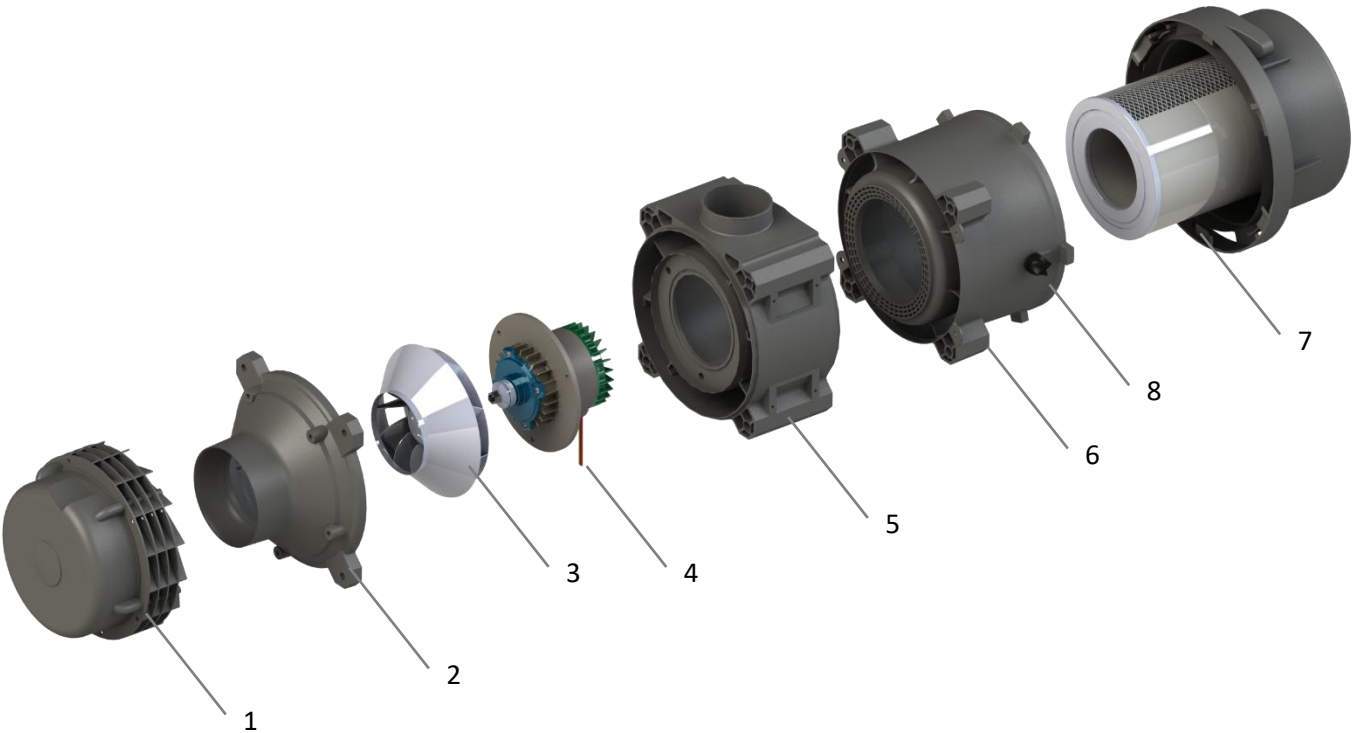
### SPECIFICATIONS HIGH-CAPACITY EPA PRESSURISER

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

Item No.	Qty.	Description	Part No.
1	1	Pre-cleaner	200004
2	1	Cone	200007
3	1	Fan Blade	200002
4	1	Motor (24 V)	200002
5	1	Motor Housing	200562
6	1	Filter Housing	200558
7	1	Filter	510095
8	1	Water Drain Valve	200984

PARTS LIST – 24V DC PRESSURISER UNIT

PRESSURISER ASSEMBLY No: 210000





By **BreatheSafe**

Handle with care. Do **NOT** touch filter media.  
EPA filters cannot be cleaned.

EPA E11 Grade Filter  
Test Method: EN1822  
Efficiency: 95% @ 0.3 Microns

Filter Information



PN: 510095

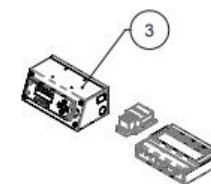
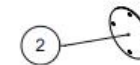
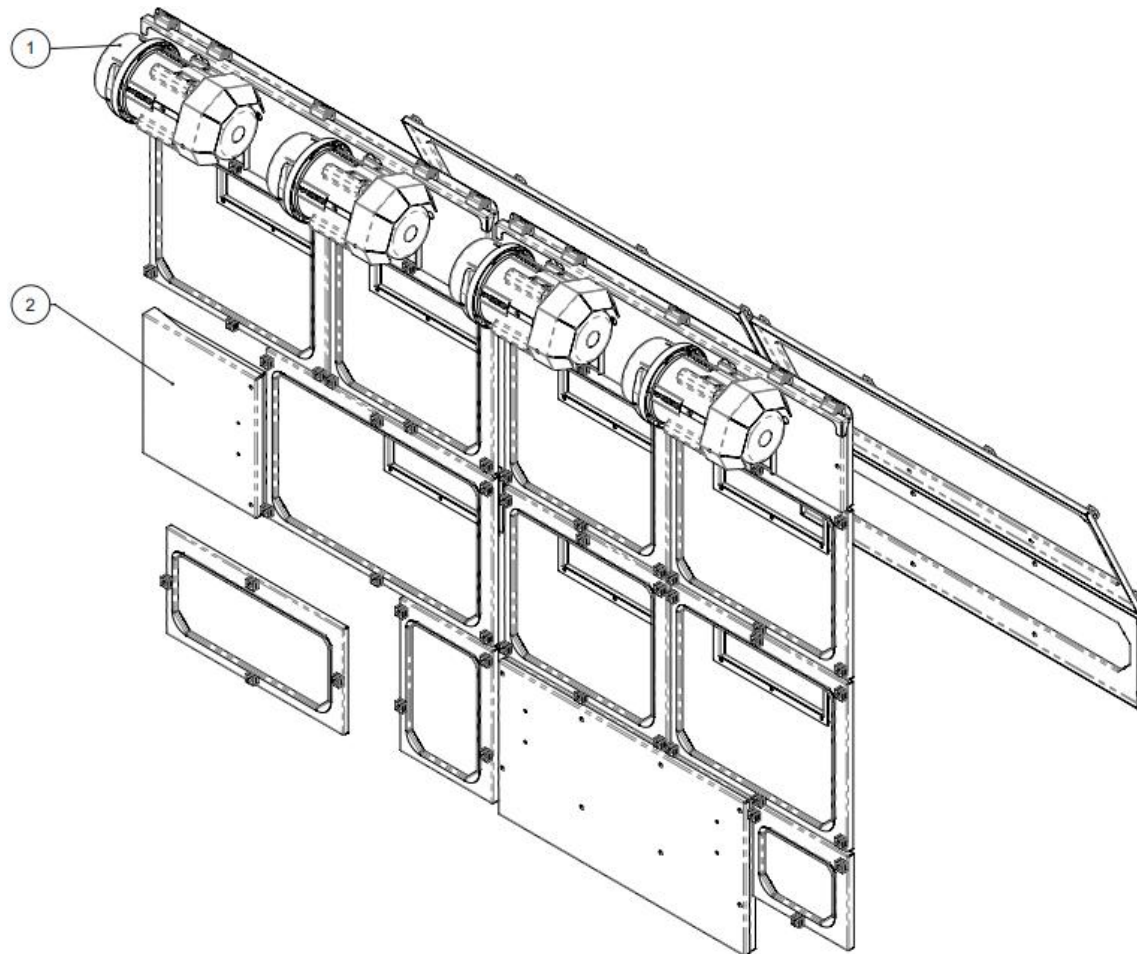
US: +1 800 359 1704 | AU: +61 7 3276 7833  
sales@breathe-safe.com | breathe-safe.com



Item No.	Part No	Rev	Description	Qty	Colour	Group
1	100757A01	0A	High Pressure Unit Module	1	New Cat Yellow 98489749	Module
2	100757Q01	0A	Sealing Module	1	New Cat Yellow 98489749	Module
3	100757M01	0A	Controller Module	1	New Cat Yellow 98489749	Module

PARTS GA

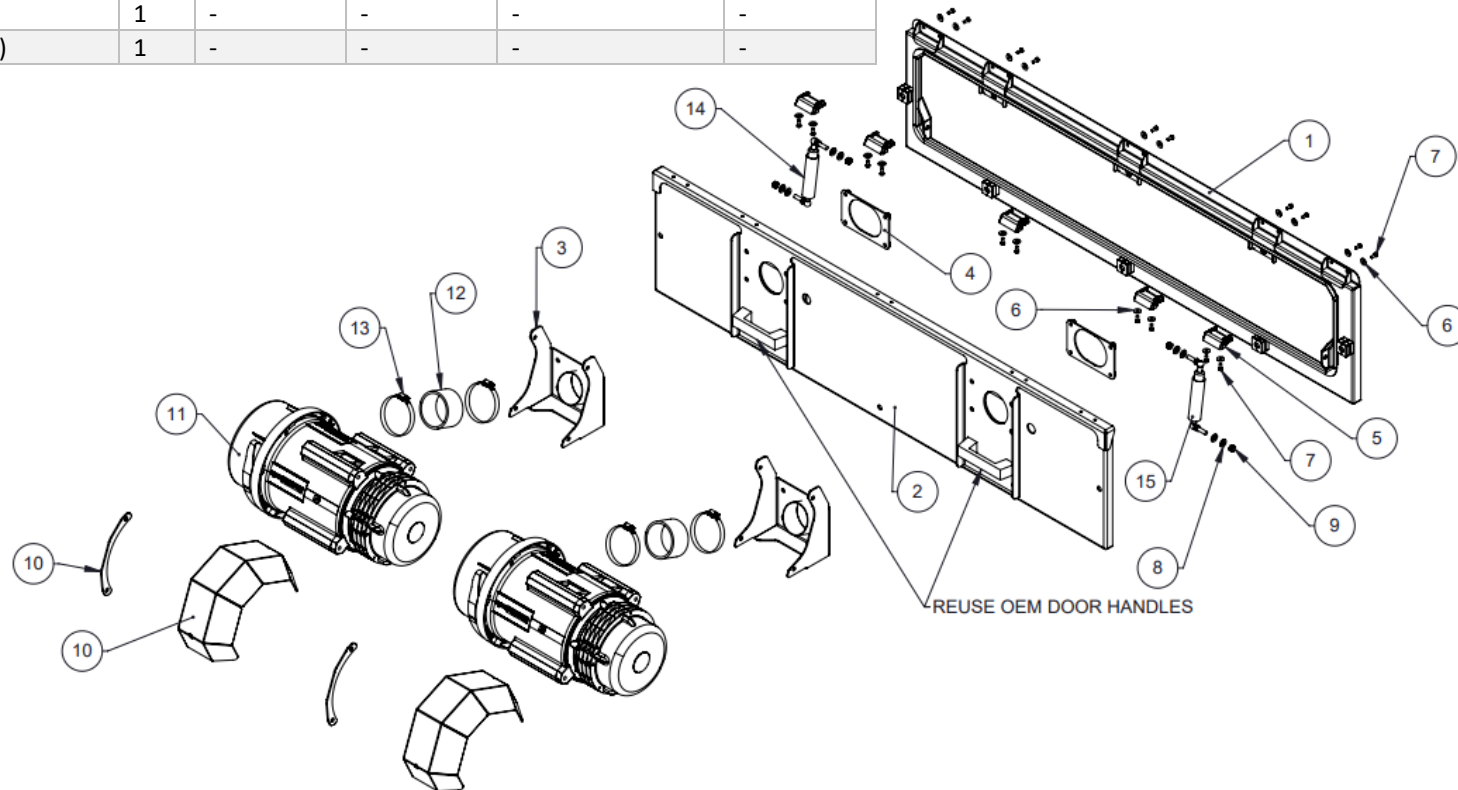
COMPLETE ASSEMBLY No: 720007





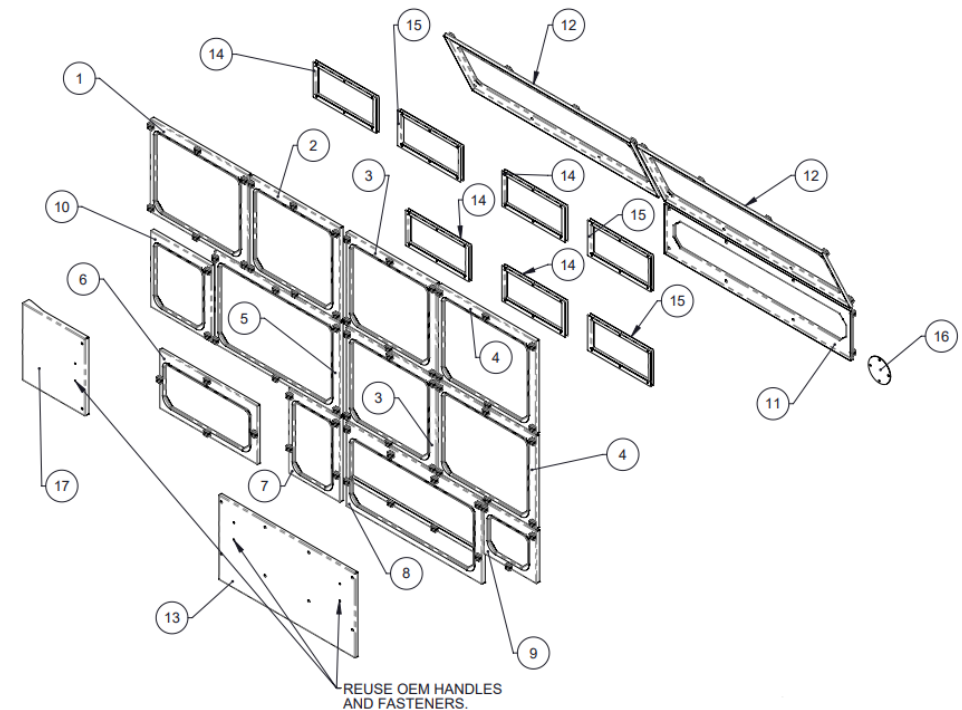
Item No.	Part No.	Rev	Description	Qty	Material	Thickness	Colour	Group
1	100757A03	0A	Top Base Weldment	1	-	-	Cat 98489749	Weld Assy
2	100757A04	0A	Top Door Weldment	1	-	-	Cat 98489749	Weld Assy
3	100757A05	0A	TL Mount Weldment	2	-	-	Cat 98489749	Weld Assy
4	100757A07	0A	Clamping Plate Weldment	2	-	-	Cat 98489749	Weld Assy
5	301644	0A	Hinge Surface Mount Chrome Pl	5	-	-	-	-
6	300170	-	Washer Flat M5 x 16 x 1.4	20	Zinc Plated	-	-	Fasteners
7	300167	-	Bolt Set Screw M5 x 12L	20	Zinc Plated	-	-	Fasteners
8	300224	-	Washer HT Flat M8x18x2	9	Zinc Plated	-	-	Fasteners
9	300249	-	Nut Nyloc M8 ZP	4	Zinc Plated	-	-	Fasteners
10	250068	1	TL WC Guard Short with Spacer	2	-	-	As Req'd	Stock Item
11	210000	[*]	HPAFU 24VDC VSD TL4	2	N/A	-	-	Stock Item
12	300851	-	76 ID Silicone Hose 50L	2	Silicone	-	-	Pipework
13	300001	-	Clamp Hose W 65-89 SS	4	-	-	-	Pipework
14	301750	-	Gas Strut (w locking tab)	1	-	-	-	-
15	301751	-	Gas Strut (w/o locking tab)	1	-	-	-	-

### PARTS LIST – PRESSURISER MODULE



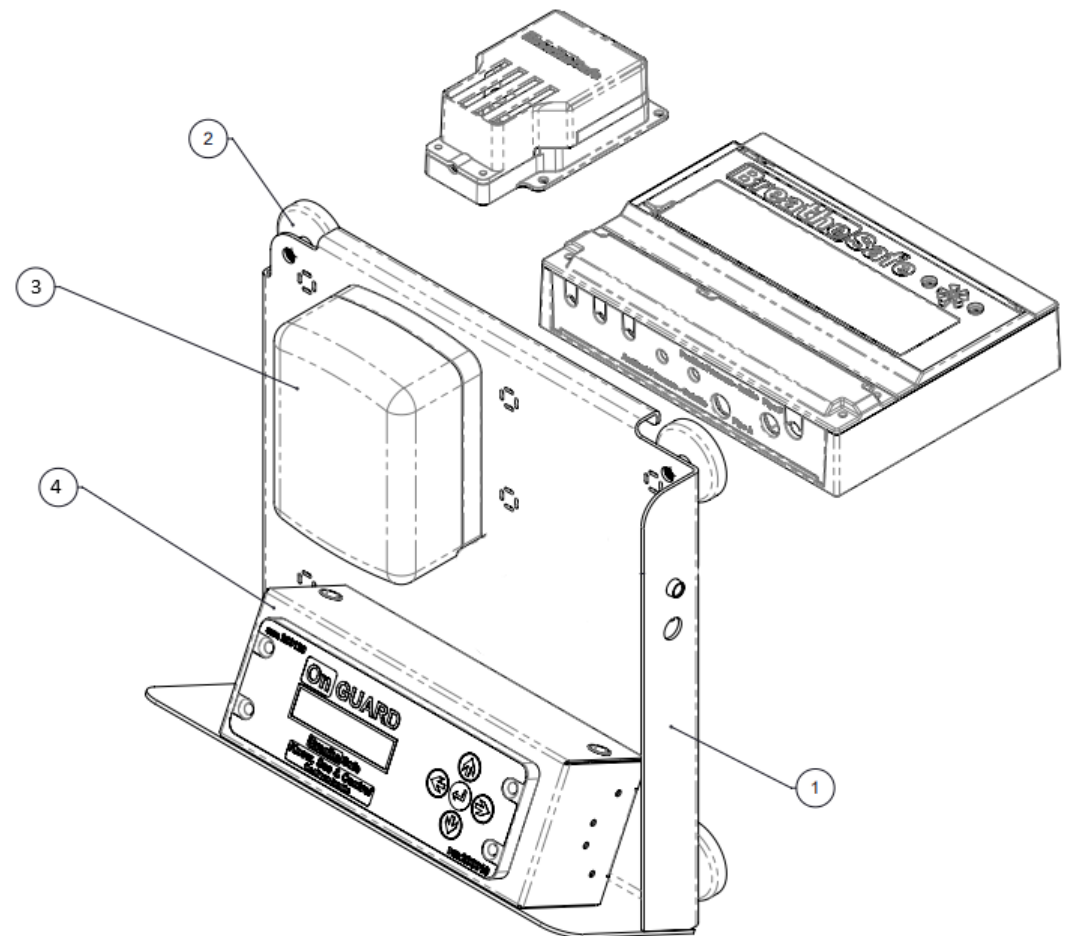
Item No.	Part No.	Rev	Description	Qty	Material	Thickness	Colour	Category
1	100757Q02	0A	Panel Weldment 2	1	-	-	New Cat Yellow 98489749	Weld Assy
2	100757Q03	0A	Panel Weldment 3	1	-	-	New Cat Yellow 98489749	Weld Assy
3	100757Q04	0A	Panel Weldment 4	2	-	-	New Cat Yellow 98489749	Weld Assy
4	100757Q05	0A	Panel Weldment 5	2	-	-	New Cat Yellow 98489749	Weld Assy
5	100757Q06	0A	Panel Weldment 6	1	-	-	New Cat Yellow 98489749	Weld Assy
6	100757Q07	0A	Panel Weldment 7	1	-	-	New Cat Yellow 98489749	Weld Assy
7	100757Q08	0A	Panel Weldment 8	1	-	-	New Cat Yellow 98489749	Weld Assy
8	100757Q09	0A	Panel Weldment 9	1	-	-	New Cat Yellow 98489749	Weld Assy
9	100757Q10	0A	Panel Weldment 10	1	-	-	New Cat Yellow 98489749	Weld Assy
10	100757Q11	0A	Panel Weldment 11	1	-	-	New Cat Yellow 98489749	Weld Assy
11	100757Q12	0A	Panel Weldment 12	1	-	-	New Cat Yellow 98489749	Weld Assy
12	100757Q14	0A	Panel Weldment 14	2	-	-	New Cat Yellow 98489749	Weld Assy
13	100757Q140	0A	Door 9	1	AL 5052-H32	3	New Cat Yellow 98489749	Part
14	100757Q15	0A	Cowling Extension 1	4	-	-	New Cat Yellow 98489749	Weld Assy
15	100757Q17	0A	Cowling Extension 2	3	-	-	New Cat Yellow 98489749	Weld Assy
16	100757Q170	0A	Spigot Blanking Plate	1	G250	3	New Cat Yellow 98489749	Part
17	100757Q139	0A	Panel 13 Folding	1	AL 5052-H32	3	New Cat Yellow 98489749	Part

### PARTS LIST – SEALING MODULE



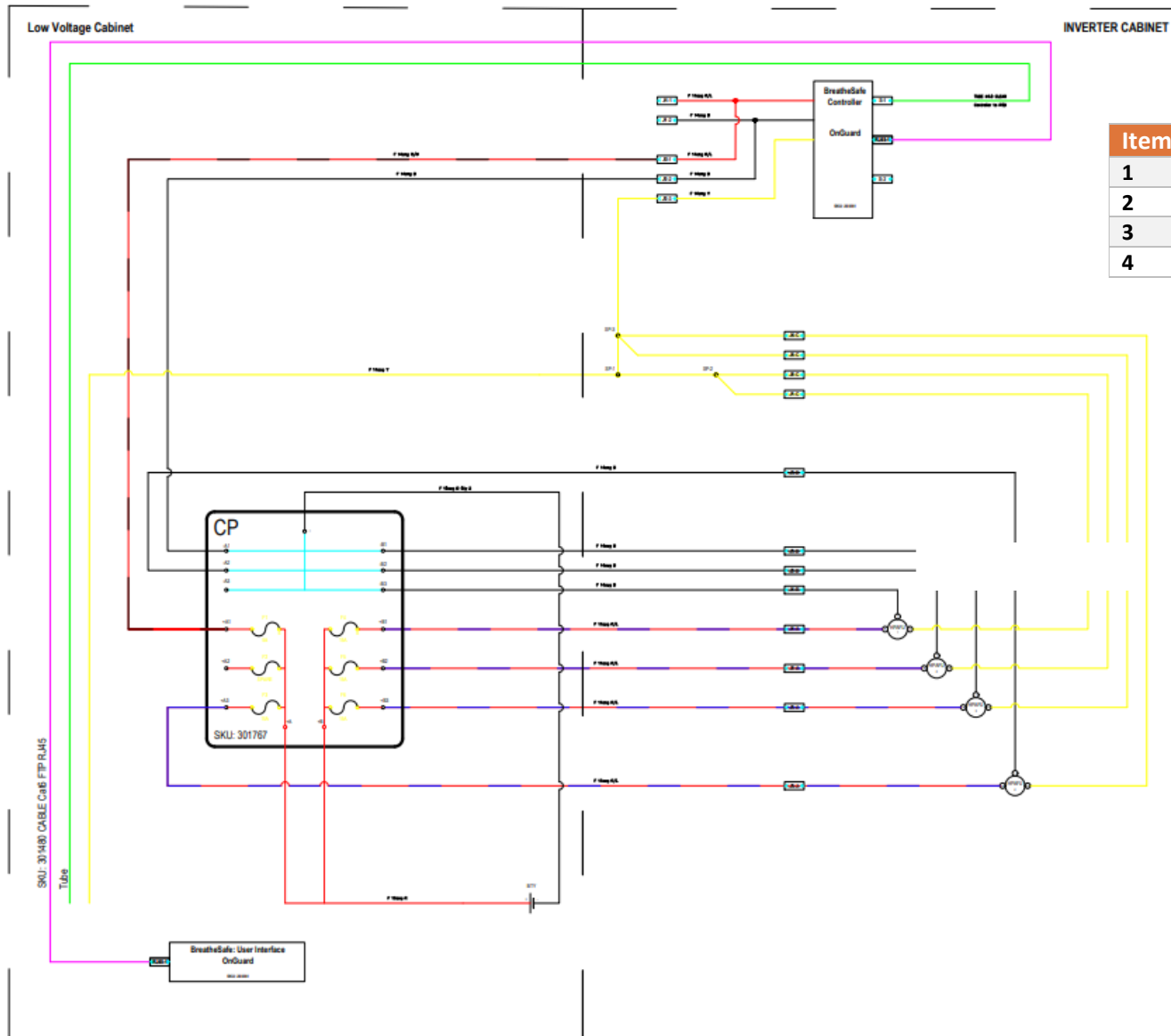
Item No.	Part No.	Rev	Description	Qty	Material	Thickness	Colour	Category
1	100757M02	1	Monitor Mount Bracket – CAT 796AC	1	-	-	(As Req'd)	Stock Item
2	300469	0	Clamp Magnetic M6 20MM	4	Zinc Plated	1.6	-	Hardware
3	301767	-	Circuit Protection Fuse Holder Mini Blade – 6 pole	1	-	-	-	Hardware
4	250100	0	Monitor Box, Small	1	-	-	(As Req'd)	Stock Item

### PARTS LIST – CONTROLLER MODULE



## Wiring Diagram

## TECHNICAL DETAILS

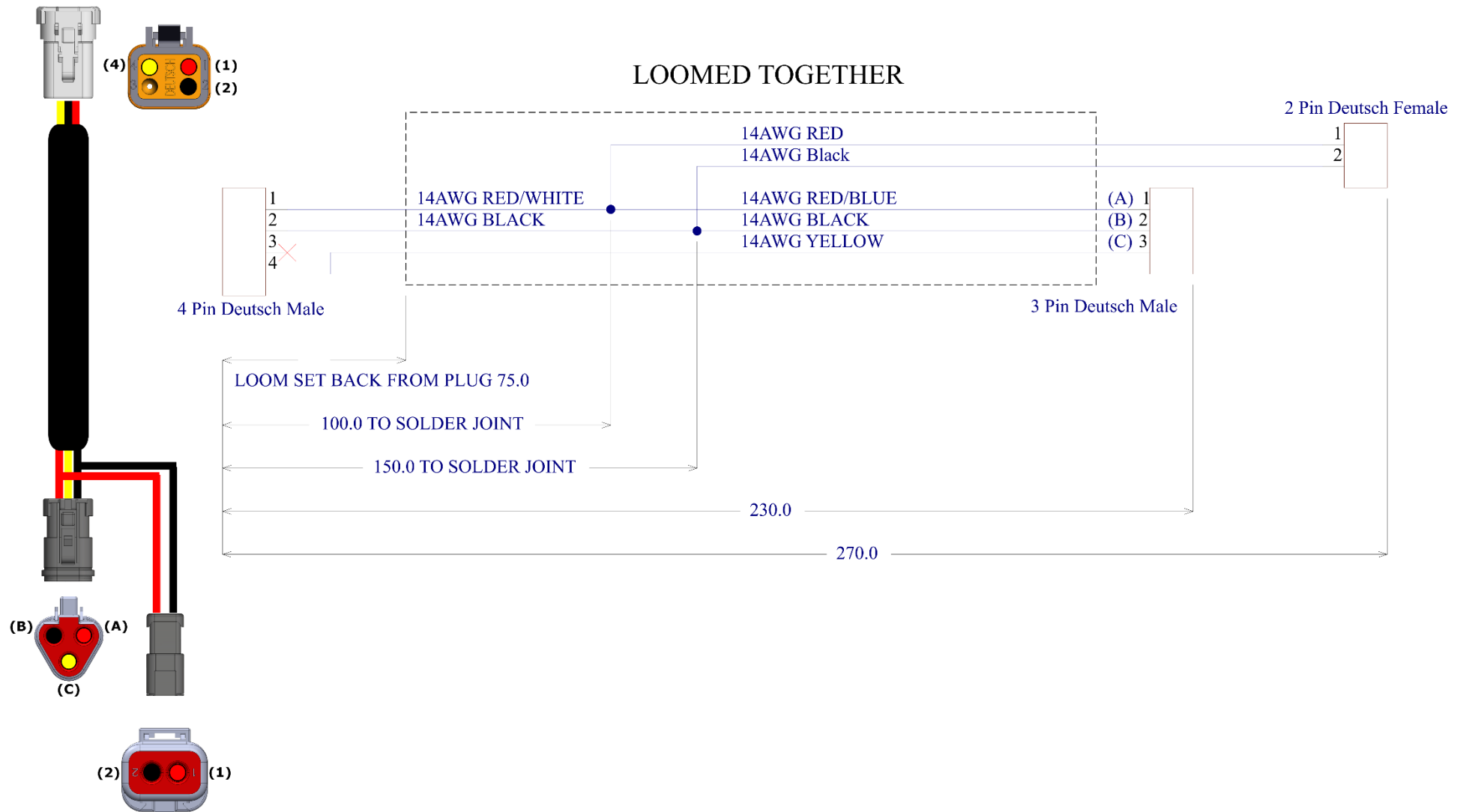


Item No.	Part No.	Description	Qty
1	200361	OnGuard Main Unit Active	1
2	200604	OnGuard TS User Interface	1
3	210000	EPA E11 High Pressure Air Filtration Unit	1
4	510095	EPA E11 Fresh Air Filter	1

Item No.	Part No.	Rev	Description	Qty	Colour	Category
1	400009 (L100009)	N/A	4 Pin 0.5m Master Controller Loom	1	-	Stock Item

## PARTS LIST – MASTER CONTROLLER LOOM

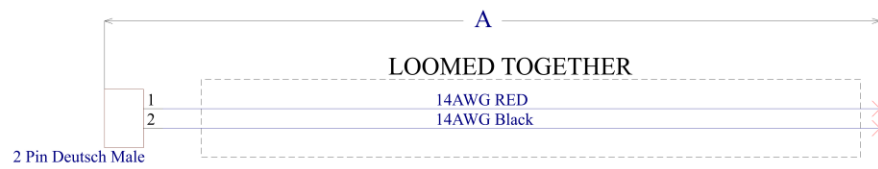
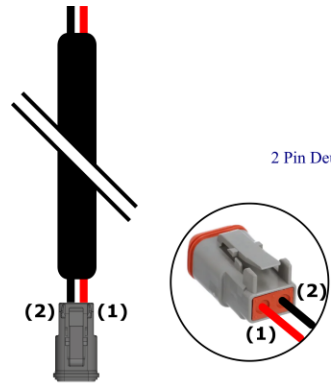
WIRING LOOM No: **400009**



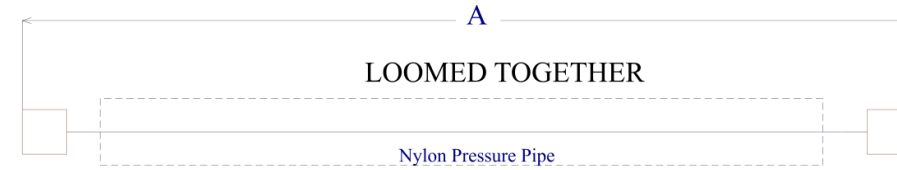
Item No.	Part No.	Rev	Description	Qty	Colour	Category
1	400002	N/A	2 Pin 5m Main Power & Earth Supply Loom	1	-	Stock Item
2	400003	N/A	3 Pin 5m Power, Earth & Speed Control Loom	1	-	Stock Item
3	400004	N/A	5m Air Pressure Sense Pipe w/ Sleeving	1	-	Stock Item

### PARTS LIST – PIN LOOMS & AIR PRESSURE PIPE

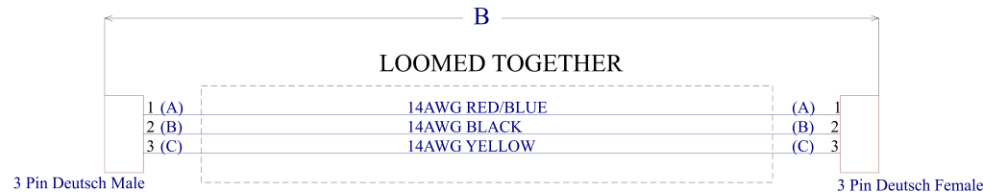
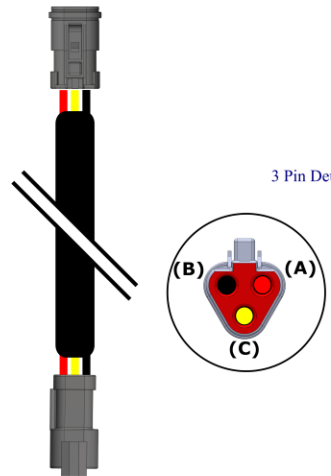
**WIRING ASSEMBLY No: 400001**



Part Number	Dimension A
400002 (L100002)	5000.0 mm
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-



Part Number	Dimension B
400004 (L100004)	5000.0 mm
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-



Part Number	Dimension B
400003 (L100003)	5000.0 mm
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-
To be Advised	-

3 Pin Deutsch Female

\*Plug Assemblies Provided Loose

## 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

**BreatheSafe**  
TBCS QLD Pty Ltd T/A BreatheSafe

Brisbane / Head Office  
63 Macquarie Street, Cairns Park QLD 4000  
07 3276 7833 / 1300 667 507

Perth Branch  
180 Cleveland Crescent, Rowville WA 6105  
08 9253 3314

### Commissioning Certificate

**Customer Details**  
Company: \_\_\_\_\_  
Customer Email: \_\_\_\_\_  
Customer PO Reference: \_\_\_\_\_  
Job Reference No: \_\_\_\_\_  
Location: Australia \_\_\_\_\_  
Customer Site: \_\_\_\_\_

**Date of Issue** \_\_\_\_\_  
**Date of Installation/Commissioning** \_\_\_\_\_

**Installer/Commissioning Technician**  
Name: \_\_\_\_\_  
From Company: \_\_\_\_\_  
Company / Agent: \_\_\_\_\_  
Installation Location: \_\_\_\_\_  
(Same as customer location)

**Machine Details**  
Brand: CATERPILLAR \_\_\_\_\_  
Type: Road Truck \_\_\_\_\_  
Model: \_\_\_\_\_  
Flare No: \_\_\_\_\_  
VIN / Serial No: \_\_\_\_\_  
Machine Age: \_\_\_\_\_  
**BreatheSafe Systems**  
Pressuriser Model: \_\_\_\_\_  
Monitor Model: \_\_\_\_\_  
Monitor Serial No: \_\_\_\_\_  
Fresh Air Filter P/N: \_\_\_\_\_  
Return Air Filter P/N: \_\_\_\_\_  
A/C Carbon Filter P/N: \_\_\_\_\_

**Removed Parts/Filters**  
Fresh Air Filter P/N: \_\_\_\_\_  
Return Air Filter P/N: \_\_\_\_\_

**Commissioning and Calibration Results**  
Date of Test: \_\_\_\_\_  
Max Pressure (Pa): \_\_\_\_\_  
Pressure Setpoint (Pa): \_\_\_\_\_  
Actual Pressure (Pa): \_\_\_\_\_  
Motor Load (%): \_\_\_\_\_

**Narcosis Real Time Cabin Results**  
Tested at A/C vent: \_\_\_\_\_  
Tested in Breathing Zone: \_\_\_\_\_

**Warranty**  
Portable Speed Motor - 3 years or 15,000 hours extended warranty

**Installation Notes**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**VoltAire**  
By BreatheSafe

Ensure doors are securely latched and sealed at all times, except during maintenance.

Auto Pre-Set Pressure (Pa): \_\_\_\_\_  
Max Cabin Pressure (Pa): \_\_\_\_\_  
Notes (Filter Part Numbers): \_\_\_\_\_

Machine / Enclosure SN: \_\_\_\_\_  
BreatheSafe Controller SN: \_\_\_\_\_  
Machine Hours: \_\_\_\_\_  
Install Date: \_\_\_\_\_

Do not blow air into the pressure sensor tube.

US: +1 800 369 1704 / AU: +61 7 3276 7833  
sales@breathe-safe.com | breathe-safe.com

[Commissioning - BreatheSafe  
\(breathe-safe.com.au\)](https://breathe-safe.com.au)



## WARRANTY

**Audit Your System Here:** [Audit Registry](https://atreg.breathe-safe.com.au/audits) (https://atreg.breathe-safe.com.au/audits)

**BreatheSafe Warranty:** [Warranty - BreatheSafe](http://www.breathe-safe.com.au/warranty/) (www.breathe-safe.com.au/warranty/)