



# Oil Vapour Removal

## OVR300 - OVR550

User Guide

(EN) Original Language

aerospace  
climate control  
electromechanical  
**filtration**  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



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# 1 Safety Information

**Do not operate this equipment until the safety information and instructions in this user guide have been read and understood by all personnel concerned.**

## **USER RESPONSIBILITY**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorised distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyse all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Parker or its subsidiaries or authorised distributors.

To the extent that Parker or its subsidiaries or authorised distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Only competent personnel trained, qualified, and approved by Parker Hannifin should perform installation, commissioning, service and repair procedures.

Use of the equipment in a manner not specified within this user guide may result in an unplanned release of pressure, which may cause serious personal injury or damage.

When handling, installing or operating this equipment, personnel must employ safe engineering practices and observe all related regulations, health & safety procedures, and legal requirements for safety.

Ensure that the equipment is depressurised and electrically isolated, prior to carrying out any of the scheduled maintenance instructions specified within this user guide.

Parker Hannifin can not anticipate every possible circumstance which may represent a potential hazard. The warnings in this manual cover the most known potential hazards, but by definition can not be all-inclusive. If the user employs an operating procedure, item of equipment or a method of working which is not specifically recommended by Parker Hannifin the user must ensure that the equipment will not be damaged or become hazardous to persons or property.

Most accidents that occur during the operation and maintenance of machinery are the result of failure to observe basic safety rules and procedures. Accidents can be avoided by recognising that any machinery is potentially hazardous.










Should you require an extended warranty, tailored service contracts or training on this equipment, or any other equipment within the Parker Hannifin range, please contact your local Parker Hannifin office.

Details of your nearest Parker Hannifin sales office can be found at [www.parker.com/dhfns](http://www.parker.com/dhfns)

Retain this user guide for future reference.

## 1.1 Markings and Symbols

The following markings and international symbols are used on the equipment or within this manual:

	Caution, Read the User Guide.		Wear ear protection
	Highlights actions or procedures which, if not performed correctly, may lead to personal injury or death.		Pressurised components on the system
	Highlights actions or procedures which, if not performed correctly, may lead to damage to this product.		Conformité Européenne
	Read the User Guide		When disposing of old parts always follow local waste disposal regulations.
	Use a fork lift truck to move the dryer.		

## 1.2 Model Number Identification

<b>Model Number:</b>	<b>OVR</b>	<b>400</b>	<b>I</b>	<b>G</b>	<b>X</b>	<b>X</b>
<b>Model</b>						
300						
350						
400						
450						
500						
550						
<b>Port Size</b>						
H = 2"						
I = 2 1/2"						
<b>Thread Type</b>						
G = BSPP						
N = NPT						
Not Applicable						
Not Applicable						

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[www.parker.com/dht](http://www.parker.com/dht)

Model: OVR400IGXX    Date:

Serial Number:

AC Cartridge: 400OVR    Qty:

Volume:  litres


Min Operating Temp: 1.5 °C    35 °F


Max Operating Temp: 50 °C    122 °F

Min Operating Press: 0.5 bar g    7.25 psig

Max Operating Press: 16 bar g    232 psig

Test Pressure: 24.0 bar g    348 psig





## 2 Description

Oil vapour, is oil in a gaseous form and will pass straight through coalescing filters, which are designed to remove liquid oil and oil aerosols.

The OVR uses a large bed of activated carbon adsorbent, for the removal of oil vapour and odours and provides the ultimate protection against oil contamination in all kinds of industries, where air purity is critical. The OVR must be protected by coalescing filters upstream of the unit.

### 2.1 Technical Specification

#### Flow Data

Model	Pipe Size	L/s	m <sup>3</sup> /min	m <sup>3</sup> /hr	cfm
OVR300	2"	87	5.2	314	185
OVR350	2"	177	10.6	637	375
OVR400	2"	354	21.2	1274	750
OVR450	2 1/2"	531	31.9	1911	1125
OVR500	2 1/2"	708	42.5	2549	1500
OVR550	2 1/2"	885	53.1	3186	1875
2 x OVR550	2 1/2"	1770	106.2	6371	3750
3 x OVR550	2 1/2"	2655	159.3	9557	5625
4 x OVR550	2 1/2"	3540	212.4	12743	7500
5 x OVR550	2 1/2"	4424	265.5	15928	9375

Stated flows are for operation at 7 bar g (100 psi g / 0.7 MPa g), 35°C (95°F) for flows at other conditions use the correction factors below Operating Data

Model	Min Operating Pressure		Max Operating Pressure		Min Operating Temperature		Max Operating Temperature		Max Ambient Temperature	
	bar g	psi g	bar g	psi g	°C	°F	°C	°F	°C	°F
OVR	1	15	16	232	2	35	50	122	55	131

#### Correction Factors Temperature (CFT)

Oil lubricated compressors		
°C	°F	Correction Factor
25	77	1.00
30	86	1.00
35	95	1.00
40	104	1.25
45	113	1.55
50	122	1.90

#### Correction Factors Temperature (CFT)

Oil free compressors		
°C	°F	Correction Factor
25	77	1.00
30	86	1.00
35	95	1.00
40	104	1.02
45	113	1.04
50	122	1.05

#### Correction Factors Pressure (CFP)

bar g	psi g	Correction Factor
3	44	2.00
4	58	1.60
5	73	1.33
6	87	1.14
7	100	1.00
8	116	1.00
9	131	1.00
10	145	1.00
11	160	1.00
12	174	1.00
13	189	1.00
14	203	1.00
15	218	1.00
16	232	1.00

#### Correction Factors - Inlet Dewpoint (CFD)

CDD Dewpoint	°C	°f	Correction Factor
Dry	-70 to +3	-100 to +38	1.00
Wet	+3 and above	+38 and above	4.00

It is assumed inlet oil vapour concentration does not exceed 0.05mg/m<sup>3</sup> at 35°C (95°F).  
For applications with higher oil vapour concentrations, please contact Parker domnick hunter for accurate sizing.

#### Filter Selection - Grade OVR

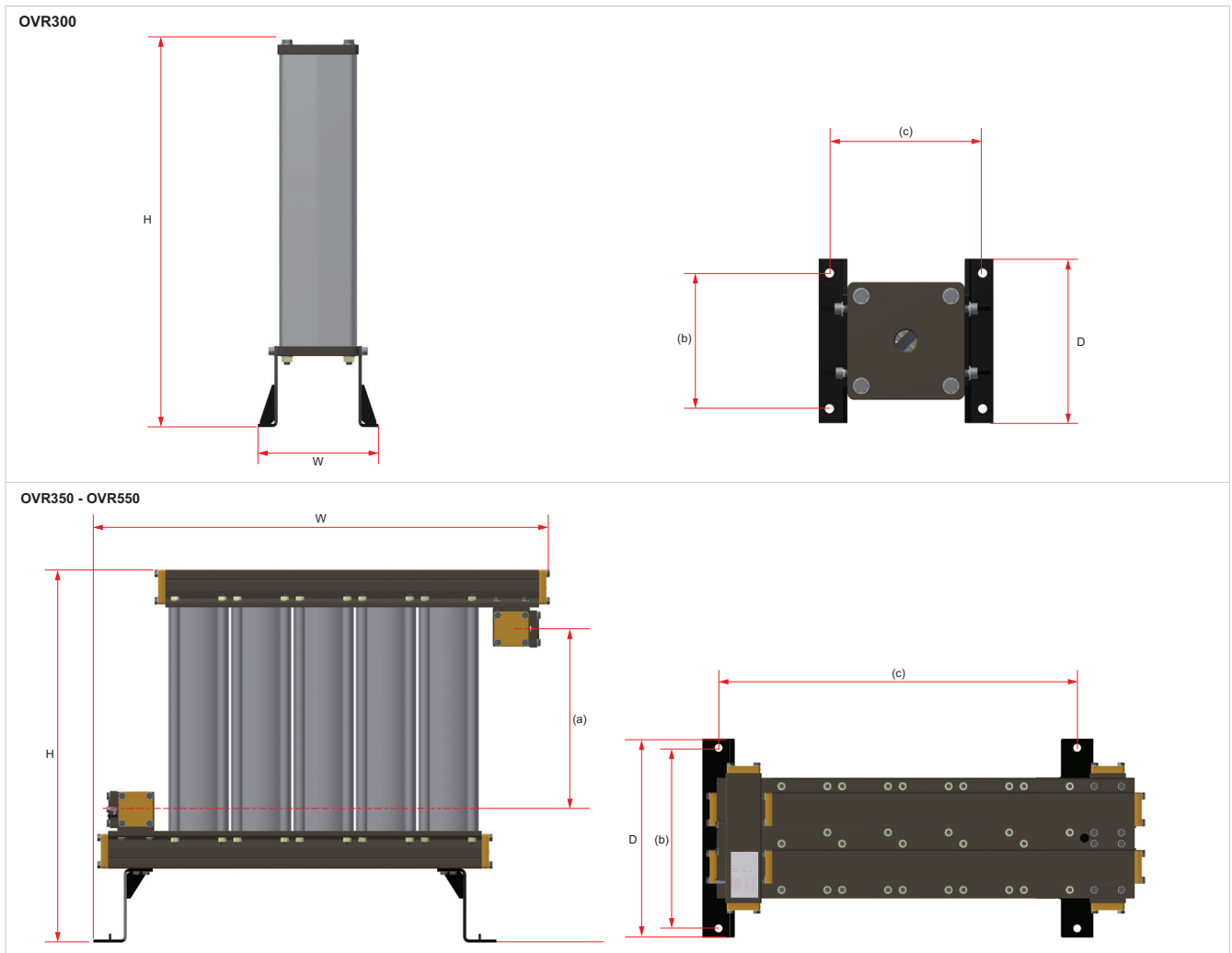
To correctly select an OVR oil vapour removal filter, the flow rate of the OVR must be adjusted for the minimum operating pressure, maximum operational temperature and pressure dewpoint of the system.

- Obtain the minimum operating pressure, maximum inlet temperature, maximum compressed air flow rate and dewpoint of the compressed air at the inlet of the OVR.
- Select correction factor for maximum inlet temperature from the CFT table to compressor type (always round up e.g. for 37°C use 40°C correction factor).
- Select correction factor for minimum inlet pressure from the CFP (always round down e.g. for 5.3 bar use 5 bar correction factor).
- Select correction factor for pressure dewpoint from the CFD table.
- Calculate minimum filtration capacity.  
Minimum filtration Capacity = Compressed Air Flow x CFT x CFP x CFD
- Using the minimum filtration capacity, select an OVR model from the flow rate tables above (OVR selected must have a flow rate equal to or greater than the minimum filtration capacity).  
If the minimum filtration capacity exceeds the maximum values of the models shown within the tables, please contact Parker domnick hunter for advice regarding larger multi-banked units.

## 2.1 Materials of Construction

Columns, Manifolds, Inlet / Outlet block	Aluminium extrusion EN AW-6063 T6
End plates / Flanges	Cast machined EN AW-6082 T6
Feet	8mm Steel plate
Fittings	Nickel plated mild steel
Adsorbent	Activated carbon
Seal materials	Nitrile, Viton, EPDM, PTFE (tape)
Paint / Ink	Epoxy coated, RUCO Black ink 10KK9006

## 2.2 Weights and Dimensions



Model	Dimensions												Weight	
	H		W		D		(a)		(b)		(c)			
	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	Kg	lbs
OVR300	792	31.2	245	9.6	230	9.1	-	-	190	7.5	215	8.5	28.5	62.8
OVR350	1009	39.7	590	23.2	550	21.7	489	19.3	500	19.7	338	13.3	62.5	137.8
OVR400	1009	39.7	735	28.9	550	21.7	489	19.3	500	19.7	508	20.0	71.5	157.6
OVR450	1009	39.7	888	35.0	550	21.7	489	19.3	500	19.7	646	25.4	92.8	204.6
OVR500	1009	39.7	1065	41.9	550	21.7	489	19.3	500	19.7	831	32.7	100.6	221.8
OVR550	1009	39.7	1234	48.6	550	21.7	489	19.3	500	19.7	1000	39.4	122.0	269.0

## 2.3 Receiving and Inspecting the Equipment

The equipment is supplied in a sturdy wooden crate designed to be moved using a forklift truck or pallet truck. Refer to the technical specification for packed weights and dimensions. On delivery of the equipment check the crate and its contents for damage. If there are any signs of damage to the crate, or there are any parts missing please inform the delivery company immediately and contact your local Parker donnick hunter office.

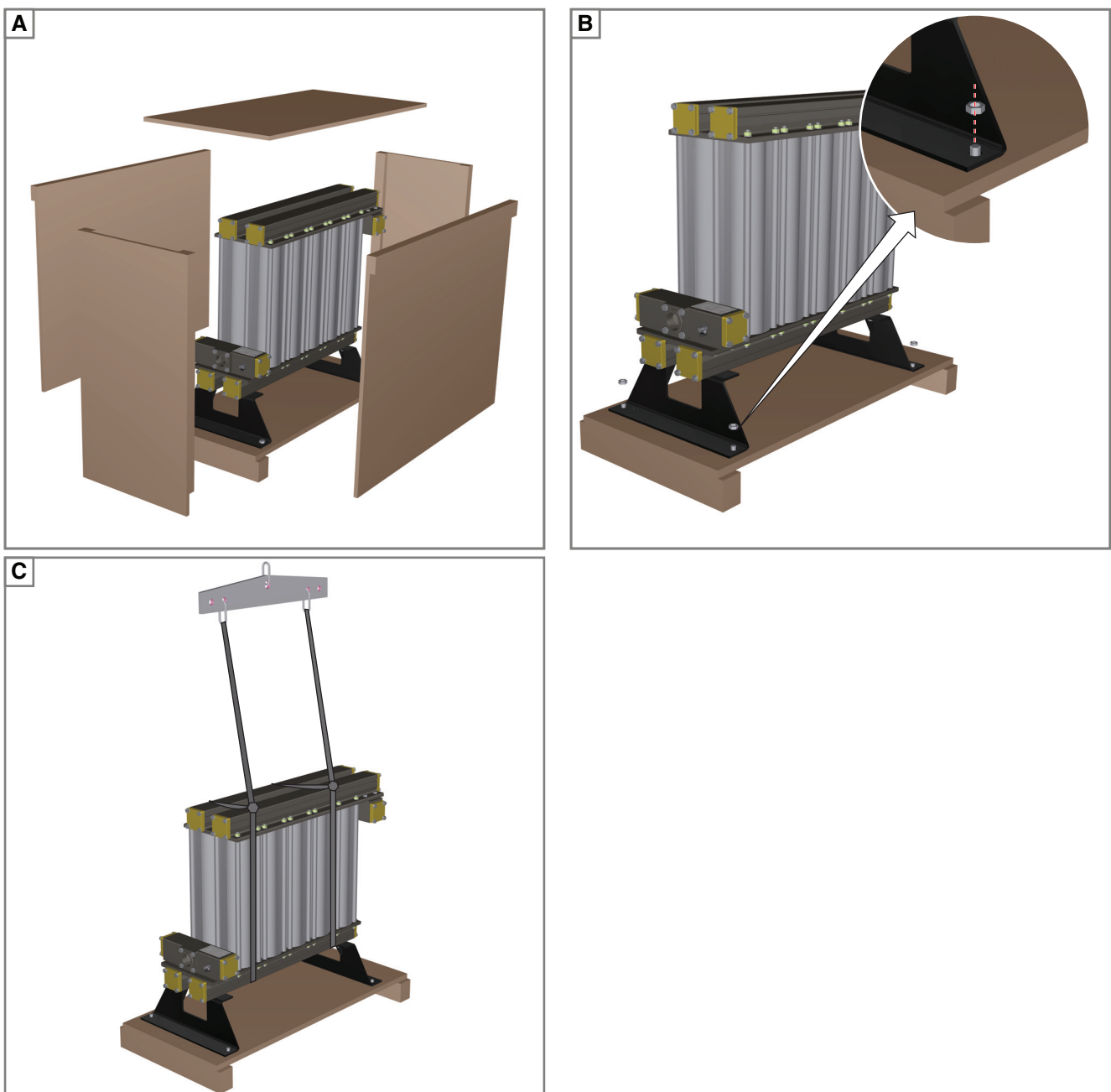
### 2.3.1 Storage

The equipment should be stored, within the packing crate, in a clean dry environment. If the crate is stored in an area where the environmental conditions fall outside of those specified in the technical specification, it should be moved to its final location (installation site) and left to stabilise prior to unpacking. Failure to do this could cause condensing humidity and potential failure of the equipment.

### 2.3.2 Unpacking

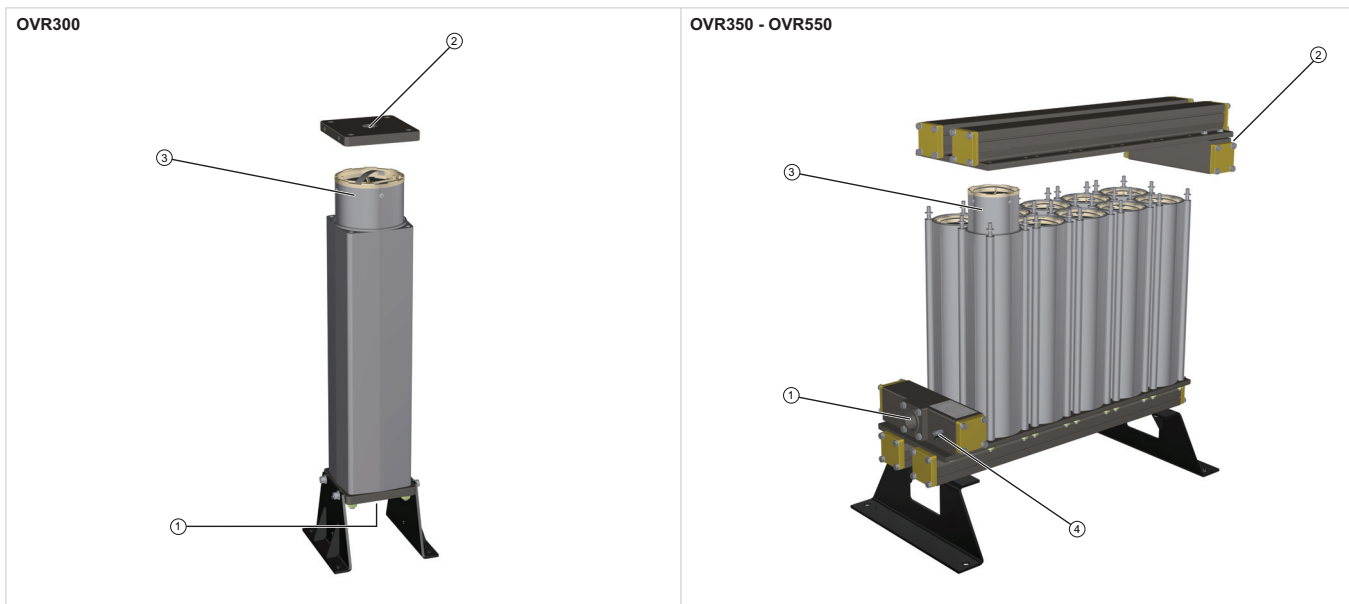
Remove the lid and all four sides of the packing crate (A) and unscrew the 4 nuts that secure the unit to the base of the crate (B). Lift the unit using suitable slings and an overhead crane (C).

Carefully move the unit to its final location, using a forklift truck or pallet truck.





## 2.4 Overview of the equipment



Key:

Ref	Description	Ref	Description
1	Inlet Manifold	3	OVR Cartridge
2	Outlet Manifold	4	Ball Valve 1/8"

## 3 Installation and Commissioning



Only competent personnel trained, qualified, and approved by Parker domnick hunter should perform installation, commissioning, service and repair procedures.

### 3.1 Recommended System Layout

OVR is an oil vapour removal filter and requires the prior reduction of liquid oil and oil aerosols to function correctly.

Coalescing filters must be installed upstream of the OVR unit (fig 1) to reduce aerosols. These filters do not need to be directly in front of the OVR, they can be part of a purification package in the compressor room. OVR must be protected with Parker domnick hunter OIL-X EVOLUTION Grade AO & AA coalescing filters to achieve claimed air purity specification.

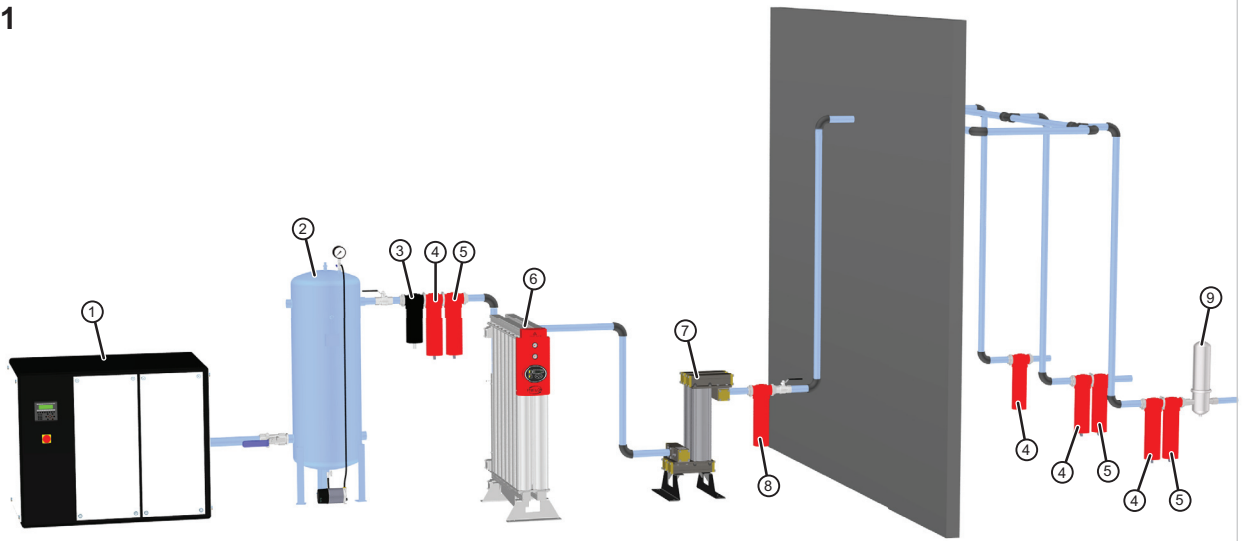
OVR can be installed either in the compressor room or at point of use. Should an installation have old, contaminated piping, an OVR may be required in both the compressor room (to protect the piping system) and at the point of use (to remove vapour from the piping system) to achieve desired air purity (fig 2).

OVR uses granular activated carbon for the reduction of oil vapour. For optimum performance, the compressed air should be dry (OVR installed downstream of a refrigeration or adsorption dryer) (fig 1 & 2). Should the installation dictate the use of the OVR prior to the dryer, the OVR must be sized correctly for high moisture content of the air and must always be installed downstream of the coalescing filters (fig 3) i.e. the last filter stage between the coalescing filters and the dryer. Coalescing filters should be protected from liquid oil / water. Should the coalescing filters be installed in a place where liquids are present, a WS grade Water Separator must also be installed prior to the coalescing filters

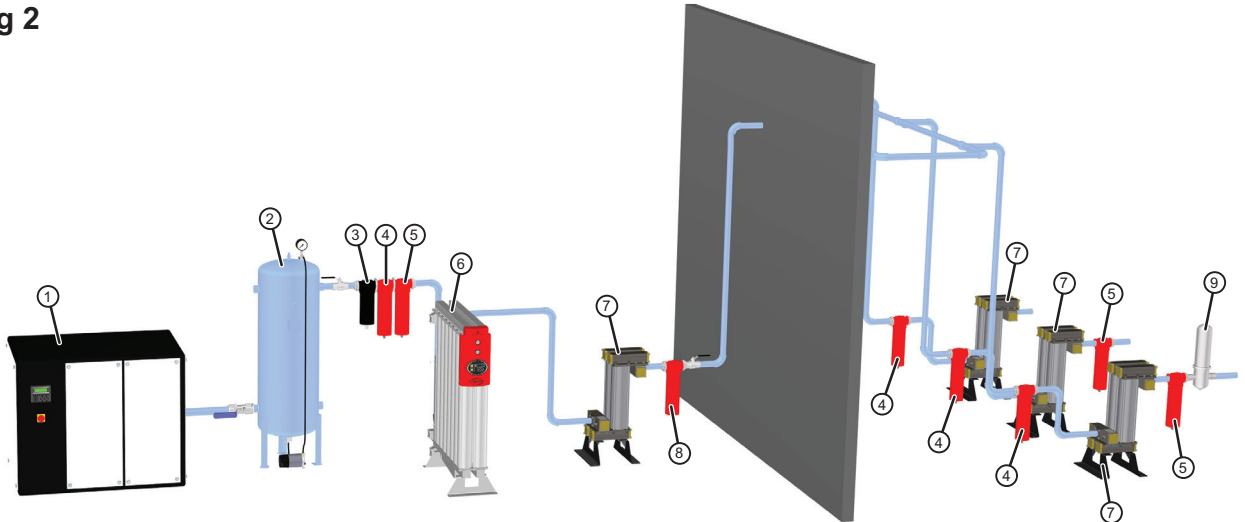
Key:

Ref	Description	Ref	Description
1	Compressor	6	Compressed Air Dryer
2	Air Receiver	7	OVR Unit
3	Water Separator	8	Dust Filter
4	General Purpose Filter	9	Stainless Steel Filter
5	High Efficiency Filter		

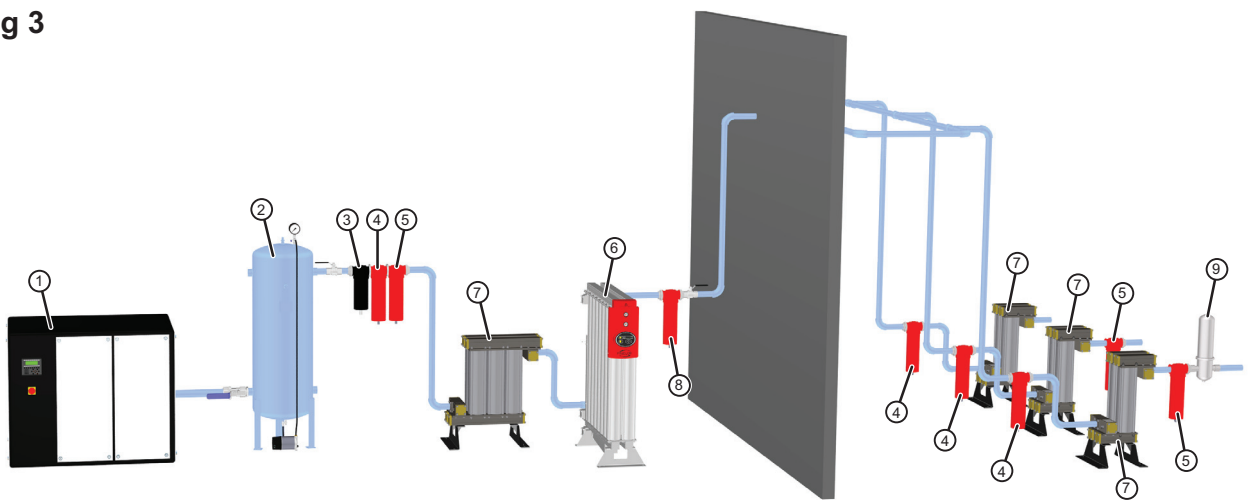
**Fig 1**



**Fig 2**



**Fig 3**



## 3.2 Locating the Equipment

### 3.2.1 Environment

The equipment should be located indoors in an environment that protects it from direct sunlight, moisture, and dust. Changes in temperature, humidity, and airborne pollution will affect the environment in which the equipment is operating and may impair the safety and operation. It is the customers' responsibility to ensure that the environmental conditions specified for the equipment are maintained.

### 3.2.2 Space Requirements

The equipment should be mounted on a flat surface capable of supporting its own weight plus the weight of all ancillary parts. The minimum footprint requirements are specified below, however there must be adequate space around the equipment to allow airflow and access for maintenance purposes and lifting equipment. A minimum spacing of approximately 500mm (20 ins) is recommended around all sides of the unit and 1000mm (39.4 ins) above it. The pump should have a minimum spacing of 100mm (4ins) around all sides.

**Do Not** position the equipment so that it is difficult to operate.

## 3.3 Mechanical Installation

### 3.3.1 General Requirements

Ensure that each filter condensate drain is suitably piped away and any effluent is disposed of in accordance with local regulations.

It is important to ensure that all piping materials are suitable for the application, clean and debris free. The diameter of the pipes must be sufficient to allow unrestricted inlet air supply to the equipment and outlet air supply to the application.

When routing the pipes ensure that they are adequately supported to prevent damage and leaks in the system.

All components used within the system must be rated to at least the maximum operating pressure of the equipment. It is recommended that the system be protected with suitably rated pressure relief valves.

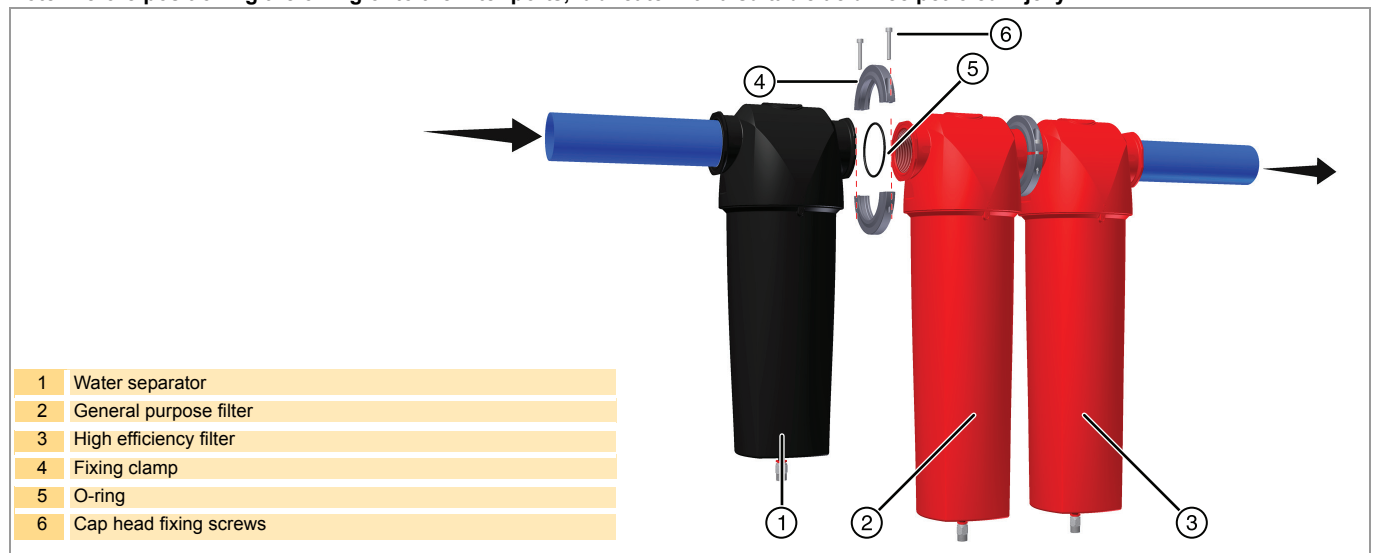
### 3.3.2 Securing the Unit

Mounting holes are provided in the feet of the unit. Once the unit has been positioned in its final location ensure that it is securely fixed in place.

### 3.3.3 Filter Installation

Multiple filters can be installed using the appropriate fixing clamps. Install the filters as illustrated in a vertical position ensuring that each fixing clamp is properly secured.

**Note:** Before positioning the o-ring onto the filter ports, lubricate with a suitable acid free petroleum jelly.



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## 4 Operating the Equipment

### 4.1 Starting the equipment

- 1 Ensure that the isolation valves on the inlet and the outlet of the unit are closed.
- 2 Slowly open the isolation valve on the inlet of the unit and verify that there are no leaks.
- 3 Check that the system pressure relief valve is closed.
- 4 Test the condensate drains of the filters and ensure they are discharging correctly into a suitable collection vessel.
- 5 Slowly open the outlet isolation valve to allow the system to pressurise. **Do not** open the valve fully until the down stream system has reached the correct operating pressure.

The unit is designed for continuous use and, once running, requires no further operator intervention.

### 4.2 Shutdown





#### To depressurise the unit

- 1 Close the isolation valve on the outlet followed by the isolation valve on the inlet.
- 2 Slowly open the drain ball valve on the outlet dust filter to depressurise the unit.

**Note: A small amount of air may be trapped between the inlet isolation valve and the equipment inlet.**

## 5 Servicing

### 5.1 Service intervals

Description of Service Required		Service recommended every:			
Component	Operation	Week	Monthly	3-month	12-month
Complete Assembly	Check for air leaks.				
OVR	Replace the adsorption cartridges - Activated Carbon <sup>(1)</sup>	See Note (1)			
					
Filtration	Replace the coalescing filter elements and automatic drains				

**(1) Unlike oil aerosol removal filters which are changed annually to guarantee compressed air quality, the lifetime of an oil vapour removal filter can be attributed to various factors and require more frequent changes. Factors affecting the lifetime of adsorption filters are:**

**Oil vapour concentration** - The higher the inlet concentration of oil vapour, the faster the activated carbon capacity will expire.

**Bulk oil** - Adsorption filters are designed to remove oil vapour and odours, not liquid oil or aerosols. Poorly maintained or non-existent pre-filtration will cause the OVR filter capacity to quickly expire.

**Temperature** - Oil vapour content increases exponentially to inlet temperature, reducing element life. Additionally, as temperature increases, the adsorption capacity decreases, again reducing element life.

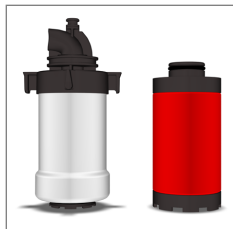
**Relative Humidity or Dewpoint** - Wet air reduces the adsorptive capacity of the carbon.

**Compressor oil changes** - When compressor oil is changed, the new lubricant burns off "light ends" which increases the oil vapour content for hours or even weeks afterwards. This increase in oil vapour content is adsorbed by the OVR filter, significantly reducing its adsorptive life.

**OVR performance is based upon a maximum oil vapour inlet concentration of 0.05mg/m<sup>3</sup>, and a pressure dewpoint of -40°C PDP. These elements should be replaced upon detection of vapour, odour or taste.**

### 5.2 Preventative Maintenance Kits

#### Recommended every 12 months



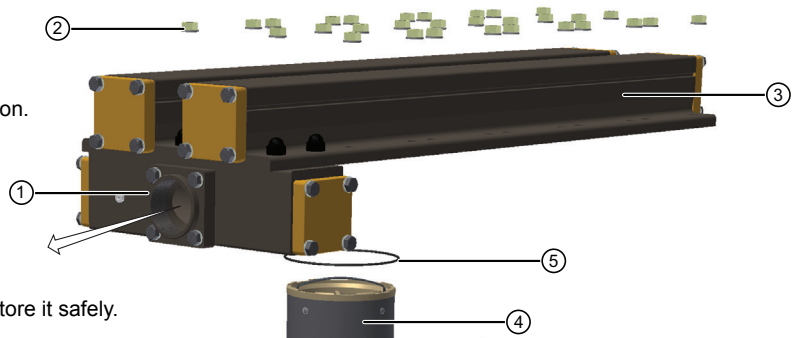
Current Parker domnick hunter Filter Service Kits to be supplied as standard. Please check the filter housing model numbers for correct element suitability.




Description	Catalogue Number	Contents	Order Qty
12 Month cartridge kit OVR300 (Every 12 months)	300OVR	AC Cartridge (x1) O-rings	1
12 Month cartridge kit OVR350 (Every 12 months)	350OVR	AC Cartridge (x2) O-rings	1
12 Month cartridge kit OVR400 (Every 12 months)	400OVR	AC Cartridge (x4) O-rings	1
12 Month cartridge kit OVR450 (Every 12 months)	450OVR	AC Cartridge (x6) O-rings	1
12 Month cartridge kit OVR500 (Every 12 months)	500OVR	AC Cartridge (x8) O-rings	1
12 Month cartridge kit OVR550 (Every 12 months)	550OVR	AC Cartridge (x10)	1

### 5.3 OVR Cartridge Replacement

- 1 Close the isolation valves.
- 2 Slowly open the drain valve on the pre-filter to depressurise the OVR and filters.  
  
Move away from the OVR during depressurisation.
- 3 Whilst supporting the outlet piping, carefully remove the outlet flange from the inlet manifold.
- 4 Unscrew the M12 manifold fixings and unscrew the fixings.
- 5 Carefully lift the inlet manifold of the OVR and store it safely.

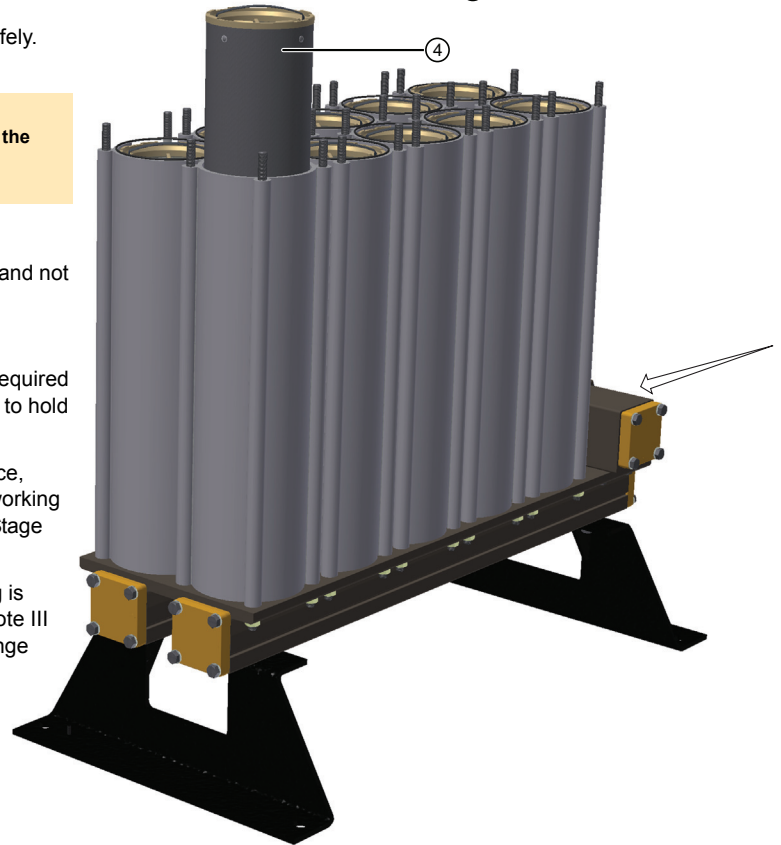




**The inlet manifold is heavy and depending upon the model of OVR may require lifting equipment.**

Warning

- 6 Lift the cartridges out of the columns and discard.
- 7 Inspect the columns and ensure that they are clean, dry and not damaged.
- 8 Fit the replacement cartridges into the columns.
- 9 Fit the replacements manifold o-rings to the manifold. If required apply a light coating of Molykote III grease to the o-rings to hold them in position.
- 10 Refit the manifold and secure the M12 fixings in sequence, starting with the bolts in the centre of the manifold and working outwards. The fixings should be secured in two stages Stage 1: 27Nm (20 ft.lb) and Stage 2: 40Nm (30 ft.lb).
- 11 Reattach the outlet flange ensuring that the flange o-ring is located correctly. If required use a light coating of Molykote III grease on the o-ring to hold it in position. Secure the flange nuts to 40Nm (30 ft.lbs).



1	Outlet flange
2	M12 Manifold fixings
3	Inlet Manifold

4	OVR Cartridge
5	Manifold o-ring



## ELEMENTS

Parker filters are designed to produce clean compressed air, gas and liquid to the highest industry standards. To maintain impeccable results, Elements within the filter must be replaced annually.

Choosing the Parker brand means you can be assured that Elements are readily available, affordable and the most energy efficient product of its kind on the market. The elements are also supplied in 100% recyclable packaging. An additional advantage of purchasing Parker Elements is that you will reduce your company's carbon footprint by 190kg. This is the equivalent of a 700 mile flight from Edinburgh to Berlin! Parker Filter Elements also prove to be highly efficient when used in any leading competitor's filters.



## PARTS

Parker Kits make everyday maintenance easy. They are available for all of our products and are simply value-for money. The Parts within the kits support our customers' varied maintenance, repair and overhaul activities.

Additionally, Preventative Maintenance Kits can be purchased for dryers and gas generators. These kits mean our customers dryer's and generator's can be serviced easily to ensure optimum performance.

An extensive range of durable Parker Parts can be obtained within 24 hours to any European, Middle East or African destination.



## SPECIALISED SERVICES

Parker Specialist Service Engineers test on-site efficiency measuring many variables including airflow, pressure, temperature, dewpoint and power consumption.

Our team of highly trained experts are the best in the industry. They take into account a range of environmental factors that could affect your system's performance. The results from this Specialist Service are extremely accurate and produce invaluable information.

Importantly, Parker informed recommendations lead to significant savings for our customers, which mean they return time and time again for our advice and products.



## M.R.O

Maintenance Repair & Overhaul - Parker Technicians are the industry's finest. Their skills and qualifications are annually approved to keep their product and legislation knowledge fresh and expertise relevant.

With this in mind, Parker offers onsite and on demand servicing to meet customers' unique requirements in a timely and efficient manner.

Parker MRO service ranges from a basic maintenance check covered under product warranty right through to a comprehensive programme, which even puts the onsite application under the microscope.

With customers at the heart of everything Parker does, the MRO service is no exception to this.

Parker Filter Elements also prove to be highly efficient when used in any leading competitor's filters



## SUPPORT SERVICES

Parker Support Services are the first port of call for customers in need of help or guidance.

The fact that this team is responsible for the production of User Guides and Manuals gives you an insight into the level and detail of their parts and product knowledge.

Over-the-phone support is just one way in which Parker's extremely knowledgeable team, quickly reduces downtime or resolves product queries.

On some occasions engineers need to be on site to carry out a repair. In these cases, the local engineer will be quickly dispatched to ensure our customers can return to production as soon as possible.

One-to-one training can also be provided by our Support Services team. This has enabled hundreds of Parker distributors to gain an in-depth understanding. Training will also ensure distributors can make timely repairs and easily maintain their customers' products.





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## 6 Declaration of Conformity

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### Declaration of Conformity

EN

**Parker Hannifin Manufacturing Limited, domnick hunter Filtration and Separation**  
Dukesway, TVTE, Gateshead, Tyne & Wear, NE11 0PZ. UK

**OVR II (Oil Vapour Removal)**  
**OVR300, OVR350, OVR400, OVR450, OVR500, OVR550**

**Directives**

97/23/EC

**Standards used**

Generally in accordance with ASMEVIII Div 1 : 2004.

**PED Assessment Route :**  
**EC Type-examination Certificate:**  
**Notified body for PED:**

B & D  
Lloyds Register Verification  
71 Fenchurch St. London  
EC3M 4BS

**Authorised Representative**

Derek Bankier  
Divisional Quality Manager  
Parker Hannifin Manufacturing Limited, dhFNS

#### Declaration

I declare that as the authorised representative, the above information in relation to the supply / manufacture of this product, is in conformity with the standards and other related documents following the provisions of the above Directives.

**Signature:**



**Date:** 20/02/2015

**Declaration Number:** 00283/200215

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# NOTES

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