# DVP VACUUM PUMP SETUP, OPERATION & WARRANTY

VERSION 2.0

MODEL EC4

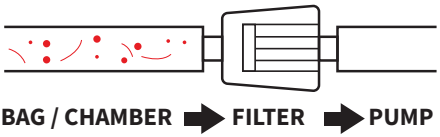
## DON'T DAMAGE YOUR DVP VACUUM PUMP!

### Damage caused by improper use is NOT covered under warranty

Your DVP EC4 vacuum pump has been manufactured to the highest standards and should provide many years of reliable service when used and maintained correctly. However, some common user errors can quickly damage the pump and would not be covered under warranty.

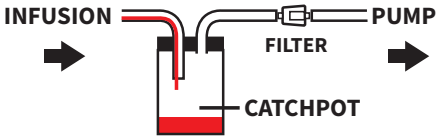
Avoid user damage to your pump by always following these essential operating instructions:

### DUST & FIBRES



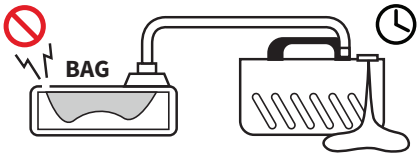

Always use an inline filter to prevent dust, dirt and fragments of fibre reinforcement from entering the pump. Failure to do so will contaminate the oil and increase wear, resulting in reduced performance. Filters should be checked and changed regularly.

### RESIN



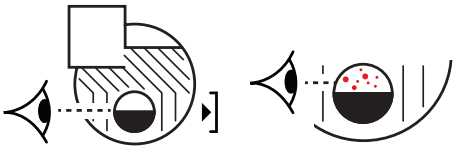

The most common cause of damage to vacuum pumps in composites is ingestion of resin, which can occur in a single major event or can accumulate over time. Always use an inline catchpot and filter when using the pump with liquid resin.

### LEAKS




EC4 is not designed for continuous use in a leaking condition. When run against even a small leak in a bag or equipment for a prolonged time, oil may start to spill from the mist separator, eventually running the pump dry of oil and seizing the motor.

### OIL



**EC4 ships without oil. Add oil before use!**

Ensure oil is maintained at correct level, top-up as necessary. Regularly check for signs of contamination and replace immediately if it appears discoloured or cloudy.

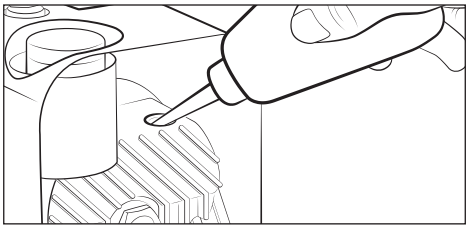
**Please continue to read for full setup and operating instructions...**

# 1. SETUP & FIRST USE

## 1.1 FILLING THE PUMP WITH OIL

EC4 is an oil lubricated vacuum pump and requires oil to run. It is shipped without oil and so must be correctly filled with the supplied vacuum pump oil BEFORE IT IS SWITCHED ON. Follow these steps to fill the pump with oil ready for first use:

1. Unscrew the oil filler plug (turn counterclockwise) using a 5mm hex key.
2. Using the supplied oil, fill the pump until the oil is half way up the sight-glass on the end of the pump. It might take a few moments for the oil to work its way down into the pump.
3. Replace the oil filler plug and tighten again using a hex key.

## 1.2 MAINS POWER SUPPLY

Connect the pump to the mains power using a male IEC power lead appropriate for your region. Please note that your DVP pump is designed to run on 230-240V (50/60Hz). Do not attempt to run the pump on any other voltage or frequency.

## 1.3 VACUUM HOSE CONNECTION

As standard the EC4 is supplied with a hose-tail barb fitting designed for an 8mm ID vacuum hose.

The fitting can be exchanged for any alternative fitting which uses a 1/4" BSP-T (also known as 1/4" G) thread. When changing the fitting, be sure to use PTFE tape to seal the joint.

# 2.OPERATING INSTRUCTIONS

## 2.1 SWITCHING ON / OFF

Your EC4 pump is fitted with a built-in non-return valve which automatically closes when the vacuum pump is switched off. This means that to operate the vacuum pump you only need to switch it on and off using the black power switch on the pump.

Please note that the non-return valve is not 100% airtight and so if your process involves leaving a bag/equipment under vacuum with the pump switched off, you should isolate the pump using a vacuum valve.

## 2.2 OPERATING CONDITIONS

In order to avoid permanent damage to your DVP EC4 pump, it is essential to ensure that the pump is only ever used under the correct operating conditions. Failure to do so may cause damage to the pump which would not be covered under warranty.

### PROLONGED USE ONLY AGAINST A PROPERLY SEALED BAG OR EQUIPMENT

EC4 is suitable for long or continuous operation but only when connected to properly sealed vacuum bags or equipment.

When connected to leaking bags or equipment, the pump will generate oil vapour which it condenses and collects as oil in a small trap. When the pump is switched off, the oil drains from the trap back into the pump to be reused. If the pump continues to run for a long time in a leaking condition, the trap – which only drains when the pump is switched off – can overfill. At this point, liquid oil may be ejected from the trap and the pump can run out of oil, causing permanent damage. For this reason, the pump should never be left running for long periods against a leaking bag or equipment. Use of an inline leak-flow indicator can provide a visual indication of an unacceptable leak condition.

### INGESTION OF RESIN

Ingestion of resin is the most common cause of damage to vacuum pumps used in composites and can occur in a single event, or can accumulate over time without the operator being aware. Unfortunately, the result is often a completely seized pump and so it is vitally important to properly protect the pump from resin ingress.

When using the vacuum pump in processes that involve liquid resins, always install a catch-pot between the vacuum bag and the pump. Make sure that the resin-side hose is pushed fully into the catch-pot and cannot permit resin to track along the underside of the lid and into the vacuum pump-side hose. Use of an inline filter just before the vacuum pump can provide a clear visual warning of potential resin ingestion.

### INGESTION OF DUST OR REINFORCEMENT FIBRES

Dust, dirt and stray fragments of fibre reinforcement ingested into the pump will contaminate the oil and increase wear, causing a reduction in performance. When operating in any environment where these types of contamination are present, a suitable inline filter should always be used on the vacuum inlet.

Regularly check the oil for signs of contamination and replace as necessary; see section 3. Maintenance.

### WATER VAPOUR

EC4 is not intended for use in high humidity environments or vacuum drying or degassing materials with a high water content, such as plaster. Use in this way causes water to enter the vacuum pump and contaminate its oil. When use in the presence of moisture is unavoidable, ensure the pump is at full operating temperature before exposing it to water vapour and plan to fully replace the oil if it becomes contaminated. Cloudy oil is a clear sign that it is emulsified/contaminated with water; see section 3. Maintenance, below.

# 3. MAINTENANCE

## 3.1 OIL LEVEL

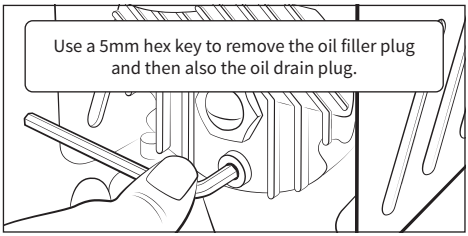
Because the oil vapour generated by the vacuum pump is collected and recycled by the oil-mist separator, the pump uses little oil and should only need topping up infrequently, however you should always monitor the oil level to ensure it is within between the minimum and maximum indications on the sight glass.

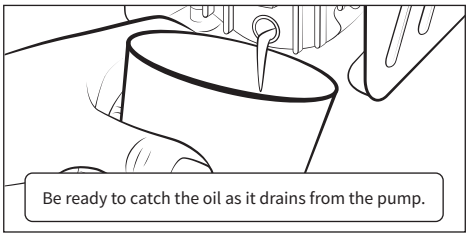
The pump uses **ISO VG 32 (SW40)** specification vacuum pump oil (Easy Composites part number **VPO32**). Do not use any other specification of oil.

## 3.2 REPLACING THE OIL

Some bubbles and cloudiness in the oil when the pump is running are normal, but if the oil appears dark, otherwise contaminated or stays cloudy when not running then it should be replaced completely by draining the old oil from the pump and replacing with new vacuum pump oil. Only ever use **ISO VG 32 (SW40)** specification vacuum pump oil (Easy Composites part number **VPO32**).

1. Run the pump with closed vacuum inlet for around 10 minutes to reduce the oil viscosity.
2. Stop the pump and disconnect the power supply.
3. Use a 5mm hex key to open the oil filler plug.
4. Be ready with a container to catch the oil and then use a 5mm hex key to open the oil drain plug.
5. Close the drain plug and fill with oil to the mid-point on the sight glass then replace the oil filler plug.




# 4. TROUBLESHOOTING, WARRANTY & REPAIR

## 4.1 FAULT DIAGNOSIS

DVP vacuum pumps are manufactured to the highest standards and are incredibly reliable when operated and maintained correctly. The pump is supplied with a 2 year warranty covering faults arising from manufacturing defects.

The warranty does not cover damage to the pump caused by improper maintenance or use, including (but not limited to) ingestion of resin or other foreign matter, running out of oil, or excessive wear caused by use with contaminated oil. Before returning a pump to us for investigation, users are advised to undertake some basic diagnostics to establish the likely cause of a fault, and thereon the appropriate course of action.

| Symptom | Likely Cause | Remedy / Next Steps |
|---|---|---|
| Oil spilling from exhaust / mist separator. | Pump has run in a leaking condition for too long and overwhelmed the oil mist separator. | 1. Remove oil mist filter and attempt to blow excess oil out using an airline, or replace the filter.<br>2. Check oil level and restore to correct level using appropriate vacuum pump oil.<br>3. Ensure bag/equipment is properly sealed or do not run for long periods in a leaking condition. |
| Pump won't turn on. | Fuse may have blown. | 1. Check fuse in plug (UK power leads only) and replace if necessary.<br>2. Check fuse inside pump's electrical box, replace if necessary.<br>Note: a blown fuse normally indicates another issue, such as restricted rotation [2]. |
| Oil appears dirty. | Pump is ingesting dust/dirt. | 1. Fully drain oil from pump. Add a small amount of oil and roll oil around inside pump then drain again to flush any residue. Fill to the line with fresh oil.<br>2. Fit an inline filter on the vacuum inlet to avoid future contamination. |
| Pump no longer achieves high level of vacuum. | Contaminated oil (possible minor resin ingestion) or incorrect oil. | Follow oil drain, flush and replacement procedure (above). |
| | Worn vanes (caused by contaminated oil or general wear). | Vanes need replacing [1]. |

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|---|---|---|
| Pump has no oil and won't turn freely or won't turn at all [2]. | Oil level not maintained correctly or oil has been ejected due to extended use in a leaking condition. | 1. Add a small amount of appropriate oil then shake the pump to disperse the oil before filling to the correct level.<br>2. With the power disconnected, attempt to turn the motor and free the vanes by rotating the fan using a pencil through the fan case. If it begins to rotate freely, reconnect the power and try the pump again:<br>• Pump pulls full vacuum > It has been recovered<br>• Pump pulls partial vacuum > It can probably be repaired but will need new vanes [1]<br>• Motor cannot be turned by the fan with a pencil > It is most likely damaged beyond economical repair and should be replaced |
| Pump has been used with a liquid resin process (vacuum bagging / resin infusion, including with a catch-pot) and has oil but won't turn freely or won't turn at all [2]. | Minor resin ingestion or significant resin ingestion. | 1. Drain all oil from the pump. Add a small amount of oil and roll oil around inside pump then drain again to flush any residue. Fill to the line with fresh oil.<br>2. With the power disconnected, attempt to turn the motor and free the vanes by rotating the fan using a pencil through the fan case. If it begins to rotate freely, reconnect the power and try the pump again:<br>• Pump pulls full vacuum > It has been recovered<br>• Pump pulls partial vacuum > It may be repairable but will need professional cleaning and new vanes [1]<br>• Motor cannot be turned by the fan with a pencil > It is most likely damaged beyond economical repair and should be replaced |

[1] The pump can be returned to Easy Composites for vane replacement at user's cost. Alternatively, replacement vanes can be ordered and fitted by a competent technician, although doing so will invalidate the pump's warranty, if it is still with its warranty period.

[2] Test the 'free running' of the pump by disconnecting the power and attempting to turn the motor using a pencil or similar instrument to turn the fan through the fan case. The fan should spin freely with minimal resistance.

## 4.2 WARRANTY TERMS & CONDITIONS

Warranty on DVP pumps sold by Easy Composites is provided exclusively by Easy Composites Ltd or Easy Composites EU B.V.

Easy Composites guarantees the product for a period of 24 months of normal use from the date of delivery of a new pump, and 6 months from the date of delivery of a pump subject to repair not under warranty. Normal use is an operating cycle of 8 hours per day for a maximum of 5000 operating hours in the 24 months covered by warranty.

Warranty is provided on a 'return to base' basis and means the free replacement or repair of any components found to be faulty from the start due to manufacturing defects. Easy Composites will do everything reasonable within its power to repair or replace a defective pump within a time of 20 working days, subject to component availability. In the event of irreparable faults, the pump will be replaced. Replacement will cause the original warranty period to apply to the new pump.

The warranty does not cover any parts that appear to be faulty due to negligence or carelessness during use, including failure to follow the instructions on setup, operation an maintenance laid out in this booklet, transport damage, normal wear, chemical corrosion, modification or circumstances which in any case cannot be attributed to manufacturing faults on the pump (see 4.1 Diagnosis). Pumps returned for repair under warranty will be inspected for signs of resin or other debris ingestion, seizing due to lack of oil and other signs of user damage.

Easy Composites declines all responsibility to anyone for any damage and consequence of any kind and/or reason that may derive from the use of the product, as well as any faults it may present, including, by way of non-limiting example, loss of business, profits, salaries, payments etc. The warranty is not extended to consumable parts, such as vanes, or faults deriving from: filtering cartridges, vanes or sealing rings.

The transport, cost and risk of damage when returning a pump to Easy Composites is the responsibility of the customer, as is the cost of return transport to the customer after repair, whether repaired under warranty or not.

## 4.3 RETURNING A PUMP FOR REPAIR

Pumps can be returned to Easy Composites for repair under warranty, or repair as a chargeable service (for pumps out of warranty or damaged by user error). Contact Easy Composites for advice on out-of-warranty or user-fault repair costs.

Before contacting us to arrange a return, it is highly recommended to perform the fault diagnosis described in section 4.1 to determine whether repair is viable. If you still wish to return a pump for inspection, it is essential to comply with the return instructions below:

### Step 1 - Request an RMA number

Contact Easy Composites customer service to obtain an RMA number. The RMA number should be clearly written on the outside of the box, and on any accompanying paperwork and is essential for us to identify your return and process it correctly. Never return a pump without an RMA number.

### Step 2 - Drain all the oil from the pump

All oil must be drained from the pump prior to return. Oil left in the pump will leak during transit, leading to further repairs and additional cost.

### Step 3 - Package the pump with adequate protection

Return transport of the pump is undertaken at the customer's risk. Pumps should be returned in their original packaging. Where this is not available, they must be adequately protected during transport. Add clear arrows to indicate the correct orientation of the package. Easy Composites will not be liable for damage that occurs during return transport.

### Step 4 - Return the pump

The pump should be returned to the address advised by Easy Composites' customer service department. Return transport is at the customer's cost and risk. We recommend using a reputable courier or transport company to ensure the safe delivery of the vacuum pump. We advise taking photographs of the packaged pump prior to shipping as evidence of its safe and appropriate packing. Be sure to retain the tracking number.

Easy Composites Ltd

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