

SMALL PUMPS AND PUMPING SYSTEMS

THE INTELLIGENT CHOICE

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Small Pumps and Pumping Systems

To meet the diverse needs of applications ranging from analytical instrumentation, wet chemistry and R&D to light industrial, Edwards offers a comprehensive range of pumping technologies.

Dry Scroll Pumps

Scroll pumps are an excellent alternative to rotary vane pumps where oil free pumping is desirable. The innovative XDS/nXDS pumps in particular use a bearing shield to isolate the vacuum environment from all forms of lubricant not only making them totally dry, but also protecting the bearing from any process gases. Vapour handling is enabled by a gas ballast; this allows the range of pumps to satisfy many applications that were previously off limits to scroll pumps.

$\leq 2 \times 10^{-2}$ mbar / $\leq 1.5 \times 10^{-2}$ Torr
5 to 35 m³h⁻¹ / 2.9 to 20.6 ft³min⁻¹

Dry scroll pumps



Oil Sealed Rotary Vane Pumps

$\leq 10^{-3}$ mbar / $\leq 10^{-3}$ Torr
0.9 to 32.3 m³h⁻¹ / 0.5 to 19.5 ft³min⁻¹

This wide range of rugged pumps offers an excellent ultimate with good pumping speed. RV pumps have superior vapour handling capabilities, while operating quietly.

Oil sealed rotary vane pumps



Diaphragm Pumps

≤ 2 mbar / ≤ 1.5 Torr
0.6 to 2.0 m³h⁻¹ / 0.35 to 1.2 ft³min⁻¹

Oil free D-LAB diaphragm pumps are made of corrosion resistant materials to withstand attack from chemicals. They are ideal for applications such as gel drying and other wet chemistry processes. The XDD1 diaphragm pumps provide oil free backing for compound turbomolecular pumps.

Easy to Service

All Edwards pumps are designed for easy routine maintenance. Key components are easily accessible and, with RV and XDS/nXDS pumps, no special tools are required. Service kits of guaranteed parts are available for routine service by the user. Worldwide support from the Edwards service organisation is also available.

Quality Manufacture

Edwards pumps are manufactured on state of the art machine tools for high consistency of components. For example, RV rotors are manufactured in a robotic cell to remove errors and inconsistencies from the manufacturing process.

Applications

Edwards high performance pumps are used in many industrial and laboratory applications, including the following:

- Electron microscopes, mass spectrometry, residual gas analysers and surface analysis
- Epoxy degassing, powder materials processing
- Solvent concentration
- Sterilisation, distillation and centrifuges
- Gel dryers and glove boxes
- Atomic emission spectrometers, nuclear physics, fusion technology and space research
- Vacuum ovens
- TV tube evacuation
- Automotive system filling
- Freeze drying
- Vacuum metallurgy

Electrical Data

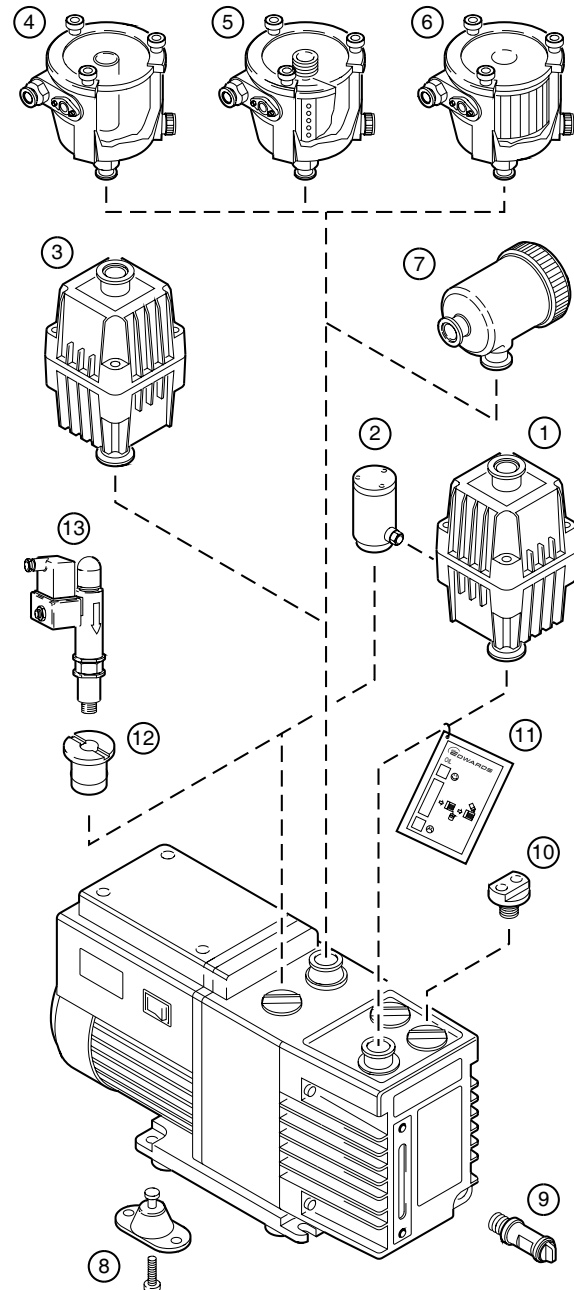
The table shows current data and suggests a suitable fuse rating. Starting current is drawn for less than one second and slow blow fuses should be used to prevent unnecessary rupture during starting. Pump outfits are rated for operation above 12 °C. Pump starting at temperatures lower than 12 °C will increase the current drawn due to the higher start torque required. This may cause the motor thermal overload to trip.

Three-phase motors should be protected by a starter consisting of a suitably rated contactor and thermal overload. The trip current regulator on the thermal overload should be set according to the starter manufacturer's instructions.

Electrical supply	Full load current (A)	Start current (A)	Suggested fuse rating (A)
E2M0.7			
200-240 V 1-ph 50/60 Hz	1.0	2.8	6
100-120 V 1-ph 50/60 Hz	1.8	5.7	10
E2M1.5			
200-240 V 1-ph 50/60 Hz	1.4	5.5	6
100-120 V 1-ph 50/60 Hz	3.1	12.0	10
RV3 and RV5			
220-240 V 1-ph 50/60 Hz	2.7	17.0	5
110-120 V 1-ph 50/60 Hz	4.4	30.8	10
200 V 1-ph 50/60 Hz	2.9	17.6	5
200-220 V 3-ph 50/60 Hz	1.7	10.2	2.5
380-415/460 V 3-ph 50/60 Hz	1.0	5.7	2.5
RV8 and RV12			
220-240 V 1-ph 50/60 Hz	3.4	17.0	5
110-120 V 1-ph 50/60 Hz	7.8	34.0	13
200 V 1-ph 50/60 Hz	4.0	17.6	5
200-220 V 3-ph 50/60 Hz	2.5	14.0	4.0
380-415/460 V 3-ph 50/60 Hz	1.5	9.0	2.5
E1M18 and E2M18			
220-240 V 1-ph 50/60 Hz	4.6	33.0	15
110-120 V 1-ph 50/60 Hz	11.0	42.0	30
200 V 1-ph 50/60 Hz	6.0	44.0	15
100 V 1-ph 50/60 Hz	12.0	88.0	30
200-230 V 3-ph 50/60 Hz	3.3	16.1	10
380-415/460 V 3-ph 50/60 Hz	1.9	10.2	6
E2M28			
220-240 V 1-ph 50/60 Hz	6.0	27.0	15
110-120 V 1-ph 50/60 Hz	12.0	36.0	30
200 V 1-ph 50/60 Hz	6.5	40.0	20
100 V 1-ph 50/60 Hz	12.0	80.0	30
200-230 V 3-ph 50/60 Hz	3.8	22.8	16
380-415/460 V 3-ph 50/60 Hz	2.3	14.3	10
XDS35i			
200-230 V 1-ph 50/60 Hz	6.6	-	16 (13 UK)
100-120 V 1-ph 50/60 Hz	10.6	-	20
XDS46i and XDS100B			
200-230 V 1-ph 50/60 Hz	6.6	-	16 (13 UK)
100-120 V 1-ph 50/60 Hz	10.6	-	20
nXDS			
200-240 V 1-ph 50/60 Hz	6	-	10
100-127 V 1-ph 50/60 Hz	10	-	13

Rotary Valve Pump Accessories

This diagram shows the accessories available for oil-sealed pumps. Refer to the following pages for details of each accessory. Note that the E-LAB2 pump is supplied with all required accessories.



- ① Outlet mist filter*
 - ② Oil return kit†
 - ③ Small volume inlet liquid catchpot
 - ④ ITO20K inlet liquid catchpot
 - ⑤ ITC20K inlet chemical trap
 - ⑥ ITF20K inlet dust filter
 - ⑦ FL20K foreline trap
 - ⑧ Vibration isolators
 - ⑨ Oil drain kit†
 - ⑩ OB20 oil box purge adaptor
 - ⑪ Oil change reminder card
 - ⑫ RV gas ballast adaptor**
 - ⑬ EBV20 solenoid operated gas ballast valve
- * EMF filter shown
† RV adjustable gas ballast oil return kit shown
‡ RV pump extension kit shown
** Not required for EM pumps

Outlet Mist Filters

Benefits of the mist filter include:

- Protection from oil mist emissions as required by COSHH and health and safety regulations
- Use of optional oil return kits results in reduced oil level maintenance and savings in pump oil
- If the oil element becomes blocked, an integral pressure relief valve opens

EMF Filters

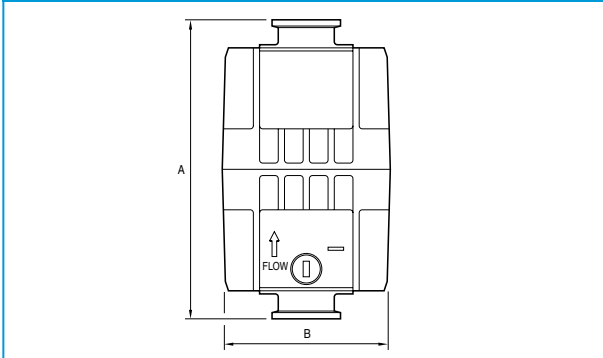
The EMF3, EMF10 and EMF20 mist filters are suitable for all small rotary vane pumps up to E2M18. (The EMF20 can be used with an E2M28 on low pressure/throughput applications; contact Edwards). They are very efficient at 99.999% DOP test and are also azide proof. The white bottom half of the body is semitransparent, allowing the oil level to be monitored. The EMF filters have a unique odour element which neutralizes the smell of oil mist.

MF30 Filter

The MF30 is suitable for E2M28 pumps. It is very efficient at 99.85% DOP test.

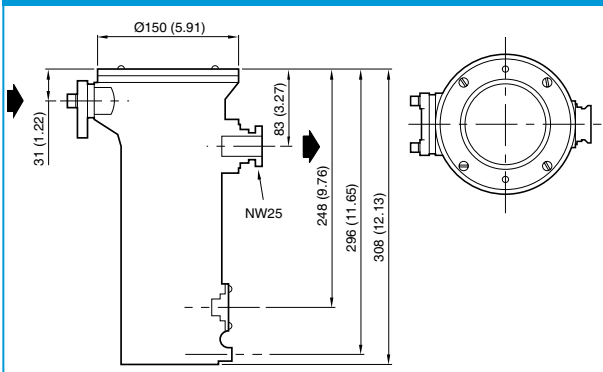
Dimensions

EMF filters



	A	B square	Inlet/outlet
EMF3	128 mm (5.03")	82 mm (3.22")	NW10
EMF10	171 mm (6.73")	97 mm (3.81")	NW25
EMF20	191 mm (7.51")	118.4 mm (4.66")	NW25

MF30 filters



Ordering information

Product description	Order no:
Model EMF3 mist filter (0.315 kg)*	A46220000
Model EMF10 mist filter (0.500 kg)*	A46226000
Model EMF20 mist filter (0.700 kg)*	A46229000
Model MF30 mist filter (1.30 kg)*	A46233000

* Supplied with NW10 clamp, centring-ring and O-ring, NW10 to 3/8 inch BSP adaptor.

† Supplied with NW25 clamp, centring-ring and O-ring, NW25 to 3/8 inch BSP adaptor.

‡ Supplied with NW25 elbow, NW25 clamp, NW25 to 3/8 inch BSP adapter and NW25 Co-Seal.

Spares	Order no:
Odour element (pack of 5)	
EMF3	A22304081
EMF10	A22304079
EMF20	A22304077
Oil element	
EMF3	A22304197
EMF10	A22304198
EMF20	A22304199
MF30	A22304057
Body seal	
EMF3	A27159538
EMF10	A27159535
EMF20	A27159534

Oil return kits

These conserve the pump oil, by returning the oil trapped in the mist filter to the pump. The gas ballast oil return kit, for example, allows extended operation of the pump with gas ballast.

Ordering information

Product description	Order no:
Clean application oil return kit (RV, Speedivac 2 to E2M0.7, E2M1.5)	A50419000
Adjustable gas ballast oil return kit (RV)	A50523000
Clean application oil return kit (E1M18 to E2M28)	A50420000

ITO20K Inlet Liquid Catchpot

These catchpots minimize the entry of condensable vapours into the pump. Benefits of the catchpots include:

- Capture condensable vapours, which would otherwise condense in the pipelines or in the pump
- Prevents froth or spray from the process from carrying over to the pump
- Corrosion-resistant body
- Visual indication of trapped liquid level
- Hand-tightened drain plug, for easy drainage

Ordering information

Product description	Order no:
ITO20K inlet catchpot, 1.84 litres capacity, weight 3.2 kg	A44110000
Small volume inlet catchpot 0.1 litre capacity, weight 0.3 kg	A44105000

Both supplied with NW25 clamp, centring-ring and O-ring.

ITD20K Inlet Desiccant Trap

The ITD desiccant trap is intended for use when pumping limited quantities of water vapour at high pumping speeds to a low vapour pressure using phosphorous pentoxide (P_2O_5) as the desiccant. P_2O_5 (not supplied by Edwards) absorbs more than 20% (by weight) of water whilst still maintaining a low vapour pressure. The trap body is an aluminium casting which contains a tray assembly made of stainless steel. The condition of the desiccant can be observed through a glass cover fitted to the top of the trap.

Ordering information

Product description	Order no:
ITD20K Inlet Desiccant Trap	A44510000

ITC20K Inlet Chemical Traps

The ITC series of chemical traps provides the following benefits:

- Protection against various aggressive vapours, which may attack the pump or pump oil
- Prevent high molecular weight vapours (such as might arise in a resin treatment plant), from reaching the pump. These vapours could cause lacquering or clogging
- The standard sorbent (activated charcoal), has relatively high trapping properties (absorbs around 25% of its own weight), even when large amounts of water vapour are being pumped
- When filled with activated alumina on two-stage pumps, backstreaming of pump oil can be controlled
- See also ITO catchpots for design advantages of the body

Ordering information

Product description	Order no:
ITC20K inlet chemical trap charcoal charge 0.4 kg, weight 3.5 kg	A44410000

Sorbent charge not supplied. Supplied with NW25 clamp, centring-ring and O-ring.

Spares	Order no:
0.5 kg activated charcoal	H12205001
3 kg activated charcoal	H12205002
0.45 kg activated alumina	H02600050
0.2 kg activated alumina	H02600056

ITF20K Inlet Dust Filter

The ITF inlet dust filters prevent the entry of dust particles into the pump. The impedance of a clean filter reduces the pumping speed of a pump by about 10% at 10 mbar and 25% at 0.1 mbar.

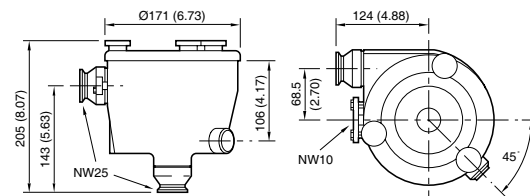
Depending on your application, you can normally clean the filter element with a vacuum cleaner or a clean air blast, and then re-use the element.

The benefits of the ITF filters include:

- Thick aluminium casting, to withstand abrasion
- Tangential entry port, to promote centrifugal separation of dust particles
- Filter efficiency better than 96% (tested to BS2831, dust number 2).

Dimensions

ITO20K, ITD20K, ITC20K and ITF20K



Ordering information

Product description	Order no:
ITF20K inlet dust filter (3.4) kg	A44215000
ITF20K element and gasket kit (0.3 kg)	A44201800

EBV Gas Ballast Control Valves

- Fit the EBV 20 valve to allow remote operation of the pump's gas ballast control.

Ordering information

Product description	Order no:
EBV20 110 V 1-ph 50/60 Hz	A50006984
EBV20 (0.5 kg) 220-240 V 50/60 Hz	A50006930
Suits the E2M0.7 to E2M28 including RV For RV and XDS pumps an adaptor is required	A50502000
For the E1M18/E2M28 an adapter is required	A50006003

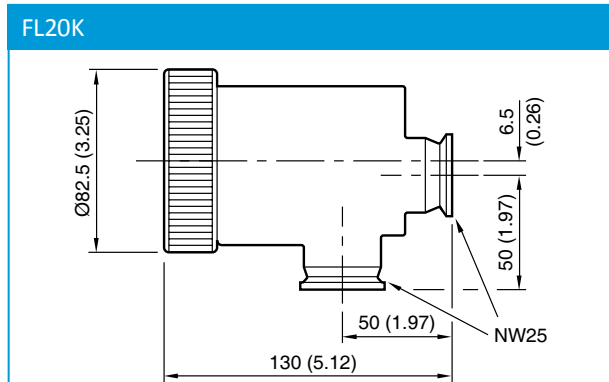
FL20K Foreline Trap

The FL20K foreline trap has been developed for use in clean pumping systems, to prevent the back-migration of rotary pump oil mist into the system. The activated alumina sorbent has the following benefits:

- Exceptional trapping properties for oil mist (99.7%)
- A very long life before it is saturated
- Can be rejuvenated by baking the basket containing the sorbent for 2 hours at 250-300 °C.

The FL20K is most useful with two-stage rotary pumps, operating below 1 mbar. To maximize sorbent life, install the FL20K near the vacuum system. In common with other types of sorbent, activated alumina absorbs water. This does not affect the oil vapour trapping properties but may tend to prolong the roughing time on successive pump downs. To minimize vapour absorption, we recommend you fit a valved by-pass line. The trap body is made of aluminium and is fitted with a removable basket containing the sorbent.

Dimensions



Ordering information

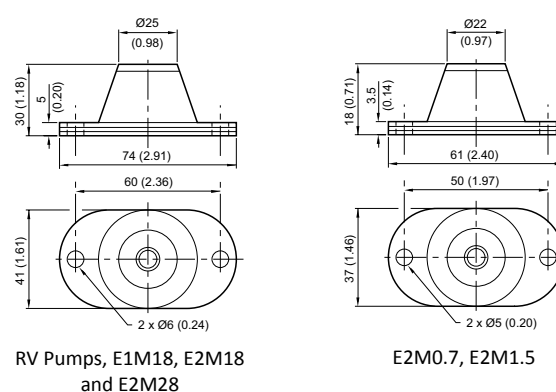
Product description	Order no:
FL20K foreline trap weight 1 kg (Supplied with 0.2 kg sorbent charge)	A13305000
Spares	Order no:
0.45 kg activated alumina	H02600050
0.2 kg activated alumina	H02600056

Vibration Isolators

You may need to fit vibration isolators to your pump if you mount it into a frame or a system, if the mounting points are not level or if you need to minimise the transmission of vibration and noise in your application. You must fit flexible bellows or other flexible pipes to the pump inlet and outlet. The height of these neoprene rubber isolators reduces by about 1 mm when the pump is fitted.

Dimensions

Vibration Isolators



Ordering information

Product description	Order no:
Vibration isolators	
E2M0.7, E2M1.5 (0.3 kg)	A24801407
RV, E1M/E2M18 (0.45 kg)	A24801404
E2M28 (0.45 kg)	A24801412

Oil Box Drain Kits

Two kits are available:

- RV easy oil box drain kit. This kit includes an oil drain extension tube for use when the oil is gravity drained. Fits E2M0.7, E2M1.5, RV, E1M18, E2M18, E2M28.
- ODP20, for use with the E1M18, E2M18 and E2M28 pumps. This accessory provides alternative methods for draining oil where access to the pump drain plug is difficult, or where there is no room for a receptacle under the drain outlet. The pack includes an oil drain extension tube for use when oil is gravity drained, and a pressure drain device with which the oil can be discharged at a high level.

Ordering information

Product description	Order no:
RV easy oil box drain kit	A50503000
ODP20 oil box drain kit	A50002000

Oil Box Purge Adaptor

This stainless steel adaptor enables a flow of dry inert gas to be introduced into the oil box to provide large scale dilution of process gases which cannot be dealt with sufficiently by the standard gas ballast facility. The adaptor replaces the oil filler plug, on the RV and E1M18/E2M18 pumps only.

Ordering information

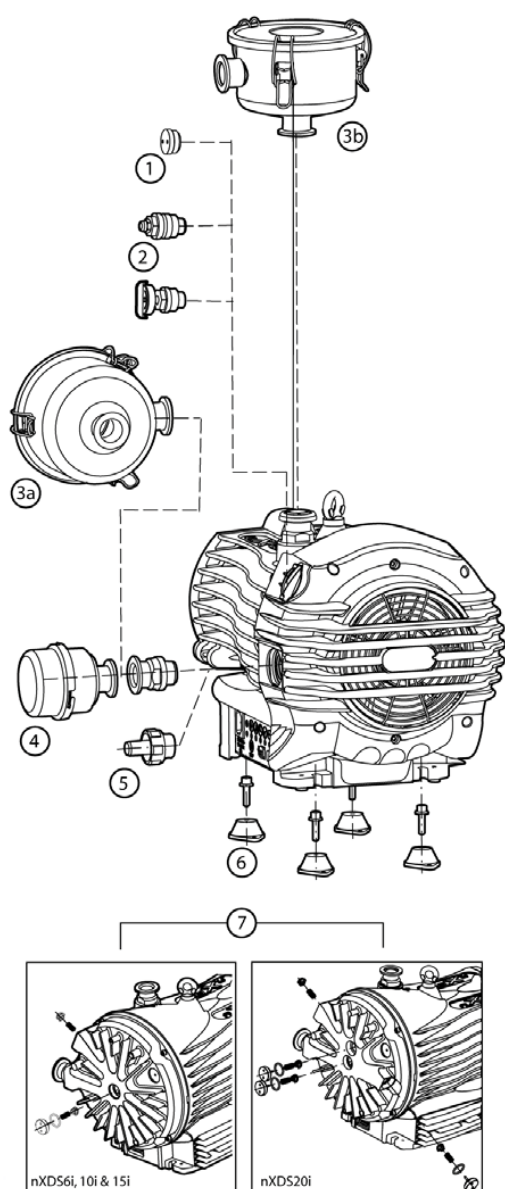
Product description	Order no:
OB20 oil box purge adaptor	A50034000

Oil Change Reminder Tag

The oil change reminder tag is a useful reminder for users to change the oil when it starts to go brown. Brown oil indicates that the oil is contaminated or degraded, and must be changed to prevent mechanical wear or failure of the pump. Tie the tag onto the pump exhaust so that it hangs over the oil box.

Ordering information

Product description	Order no:
Oil change reminder tag (pack of 10)	A20003017



- | | |
|-----------------------------|--|
| ① Gas-ballast adaptor blank | ⑤ Exhaust nozzle |
| ② Gas-ballast adaptor | ⑥ Vibration isolators |
| ③a Inlet/exhaust filter | ⑦ Chemical resistance conversion kit |
| ③b Inlet/exhaust filter | ⑧ Pump-to-controller cable (not shown) |
| ④ Silencer | |

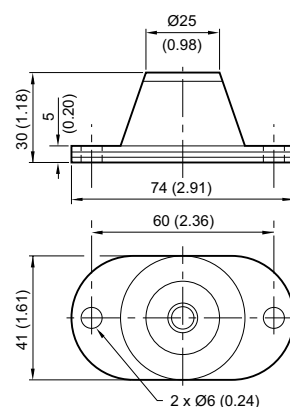
* General view (O-ring seals not shown)

Scroll Pump Vibration Isolators

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Dimensions

nXDS/XDS35i



Ordering information

Product description	Order no:
XDS35i (0.45 kg)	A24801408
nXDS (0.45 kg)	A24801441

Exhaust Silencers

For use on XDS pumps that are not connected to a house exhaust system. These silencers also offer exhaust filtration.

Ordering information

Product description	Order no:
nXDS	A50597000
XDS35i	A50597001
Spares	Order no:
Silencer spares kit	A50597800
nXDS	A50597800
XDS35i	A50597801

Gas Ballast Adaptor

Product description	Order no:
Gas Ballast adaptor blank (nXDS)	A73501806
Gas Ballast adaptor (nXDS) 0.25mm hole	A73501809
Gas ballast adaptor (nXDS) no restrictor	A73501811
Gas Ballast adaptor with 0.25 mm hole (XDS35i/46i)	A50626801

Inlet/outlet filter with 5 micron element	
Product description	Order no:
NW25 Inlet Outlet filter	A50597805
NW40 Inlet Outlet filter (XDS35i/46i)	A50597806
Spares	Order no:
XDS 5 Micron filter element kit	A50597802
XDS 1 Micron filter element kit	A50597803

Exhaust nozzle	
Product description	Order no:
Exhaust nozzle kit 3/4" to 15 mm	A50509000

Chemical Resistance Conversion Unit	
Product description	Order no:
nXDS6i, 10i & 15i Chemical resistance conversion unit	A73501807
nXDS20i Chemical resistance conversion unit	A73501808

Acoustic Enclosures

Designed for use in a laboratory or an industrial environment, Edwards new acoustic enclosures are compatible with all EM, RV and nXDS/XDS pumps ranging up to the E2M28 series/XDS46i. The acoustic enclosure reduces the noise level by up to 9dBA and incorporates internal fans to ensure adequate air cooling is provided to the pump.

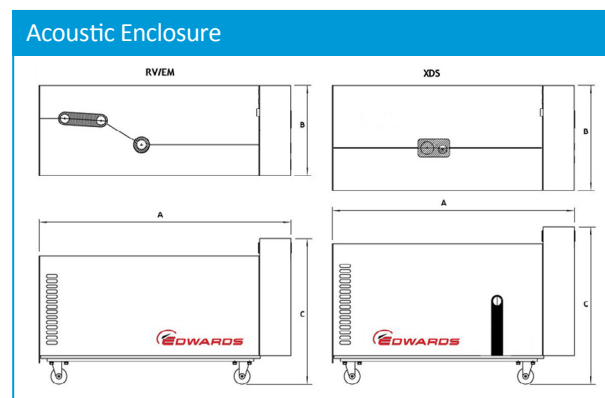
The design of the enclosure allows for it to be easily assembled or disassembled without tooling. A removable front panel also allows for quick access to the oil sight glass and if required a side panel can be removed allowing access to the oil filler cap (EM/RV only). The enclosure is powered via a power cable fitting into an IEC 320 socket.

- Simple slot together assembly means no tools are required
- Designed to attenuate the noise of an E2M28 by 7dBA or an XDS35i/46i by 9dBA
- Integrated cooling fans to maintain optimum pump running temperature
- Castor wheels with brakes for easy manoeuvrability
- Fully compatible with Edwards inlet traps, exhaust mist filters and nXDS/XDS silencer with extension spools (available separately)
- Over temperature buzzer alarm with battery back-up

Technical Data

Mass (RV-EM/XDS)	23 kg/37 kg
Electrical supply for cooling fans	100-120 V/200-240 V
Voltage	5 A Type T 20 mm
Fuse rating	IEC320 socket
Connector	
Approximate noise reduction	
RV	7dBA
E2M28	7dBA
XDS35i/46i	9dBA

Dimensions



Dimension	RV/EM	nXDS/XDS
A	790 mm	778 mm
B	285 mm	442 mm
C	460 mm	580 mm

Ordering information

Product description	Order no:
RV/EM acoustic enclosure 110-120 V	NRD317000
RV/EM acoustic enclosure 200-240 V	NRD318000
nXDS/XDS acoustic enclosure 110-120 V	NR5C0000
nXDS/XDS acoustic enclosure 200-240 V	NRD797000
Accessories & Spares	Order no:
2 m Electrical supply cable, UK 3 pin plug	A50505000
2m Electrical supply cable, N. Europe plug	A50506000
2 m Electrical supply cable, USA/Japan plug	A50507000
2 m Electrical supply cable, no plug	A50508000
NW25 Aluminium nipple 100 mm long	C10514409
NW40 Aluminium nipple 130 mm long	C10516409

Small Pumps and Accessories: Frequently Asked Questions

Oil Mist

Question: What accessory do I use to trap oil mist (which all oil sealed pumps emit during pump down or with gas ballast)?

Answer: To meet regulations and preserve pump oil, fit a recommended Edwards oil mist filter (EMF) to the pump outlet, and connect the exhaust to an exhaust line.

Question: If I operate an RV pump continuously or with high inlet pressure, what accessories do I need?

Answer: Fit an Edwards mist filter (EMF) and a gas ballast oil return (GBOR) kit. Then the pump can be operated with the mode switch open and gas ballast oil return. The oil condensed in the filter will be continuously returned to the pump oil box.

Vapour Processes

Question: Which pump and accessories should I use if my process generates vapours which could condense in the pump?

Answer: You can choose either an nXDS/XDS pump, or rotary pump. Gas ballast should be used with both pumps; to sweep the vapour through the pump. This prevents condensation and oil contamination. Operate the pump with gas ballast for at least an hour before and after use. Choose the size of pump taking into account the vapour pumping rate. If you selected a rotary pump, then you should fit a gas ballast oil return kit and mist filter. Change the oil frequently and keep an oil change reminder tag on the pump. DLAB would also be a suitable alternative depending on required pumping speed.

Dust and Particle Processes

Question: Which pump and accessory should I use if my process generates dust or grit, which could clog or damage the pump?

Answer: Use a rotary pump fitted with an inlet dust filter. We do not recommend the use of scroll pumps or XDD1 pumps for these applications.

Special Chemical Cleaning Processes

Question: Which pump and accessory should I use if my process generates oxygen or ozone?

Answer: Use a rotary pump adapted to run with Fomblin® oil or nXDS/ XDS. Contact Edwards for more information.

Question: Are there any special considerations if my pump will be used in the vicinity of organic gases, like propane?

Answer: Use a rotary pump fitted with a flameproof motor. Contact Edwards for more information.

Contamination

Question: Which pump and accessories should I use if I must ensure that my process and process chamber (operated below 0.1) are not contaminated with oil from the pump?

Answer: Use an nXDS/XDS scroll pump. Alternatively, you can use a rotary pump with a FL20K foreline trap fitted to the system inlet. The trap contains activated alumina which traps the oil molecules. To maintain the alumina charge, bake the charge basket or replace as required.

Question: How can I reduce the noise level of my pump?

Answer: If the noise is only obvious during pumping down then fitting the exhaust with a silencer (nXDS/XDS pumps), or fitting an exhaust line will reduce the level. An alternative is to fit an acoustic enclosure. Contact Edwards for more information.

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Small Pumps: Application and Accessory Information

Use the information in the list below to select the best pump and accessories for your application. The information is given as a guide only; the optimum set-up may depend on your specific method of operation. Note that you need to buy the accessories separately, unless otherwise stated.

ATEX and Flammable Gases

The following standard pump models have an internal ATEX classification of II 3 G c IIB T4:

- E2M0.7, E2M1.5
- E1M18, E2M18 & E2M28
- RV3, RV5, RV8, RV12
- nXDS6i, nXDS10i, nXDS15i, nXDS20i, XDS35i

The following standard pump models operating on hydrocarbon oil can be supplied with flameproof motors providing an external classification of II 2 G IIB T4 (or IIC):

- RV3, RV5, RV8, RV12
- E1M18, E2M18



Gel Dryers

Recommended pump: nXDS/XDS or DLAB.
Suggested accessories for DLAB: Separator.
Optional accessories for DLAB: Condenser, gas ballast valve.

Rotary Evaporation and Vacuum Ovens

Recommended pump: nXDS/XDS or DLAB.
Suggested accessories for DLAB: Separator.
Optional accessories for DLAB: Condenser, gas ballast valve.

Centrifugal Concentration

Recommended pump: nXDS/XDS.

Vacuum Filtration

Recommended pump: nXDS/XDS or DLAB.
Suggested accessories for DLAB: Separator.
Optional accessories for DLAB: Condenser, gas ballast valve.

Distillation/Extraction Apparatus

Recommended pump: nXDS/XDS or DLAB.
Suggested accessories for DLAB: Separator.
Optional accessories for DLAB: Condenser, gas ballast valve.

Freeze Dryers

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories: Mist filters, oil return.

MS Inlet Systems (like Electro-Spray)

Recommended pump: XDS35i or E2M28.
Suggested accessories for rotary vane pumps: Mist filter, oil return.
Suggested accessories for nXDS/XDS: Silencer.

Load Locks, Fume Hoods and Glove Boxes

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: Mist filter, oil return.
Suggested accessories for nXDS/XDS: Silencer.

Ultra High Speed Centrifuges

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories: Mist filter
Suggested accessories for rotary pumps: Mist filters, oil return.

Leak Detection, Electron Microscopes, Mass Spectrometers and Lasers

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: FL20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

Surface Science and Particle Size Analysers

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: FL20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

High Energy Physics

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: FL20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

Helium or Rare Gas Recirculation

Recommended pumps: nXDS/XDS

Backing Turbomolecular Pumps

Recommended pump: nXDS/XDS, XDD1 or rotary vane pumps.
Suggested accessories for rotary pumps: FL20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

Backing Diffusion Pumps

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: FL20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

Notes

- FL20K is an inlet trap, to prevent oil back-streaming.
- ITF20K is an inlet trap, to capture dust particles.
- The gas ballast facility allows atmospheric air into the pump, minimising the formation of condensates (which contaminate the oil in rotary pumps).
- An oil return kit is available for all RV and EM rotary vane pumps to allow oil to be returned from the mist filter to the pump. A gas ballast oil return is also available to allow oil to return and have gas ballast flow.

Refrigeration, Air Conditioning Systems

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: FL20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

Vacuum Furnace

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: ITF20K, Mist filter.
Suggested accessories for nXDS/XDS: Silencer.

Azide Forming Applications

Recommended pump: nXDS/XDS or rotary vane pumps.
Suggested accessories for rotary pumps: Mist filter.
Suggested accessories for nXDS/XDS: Silencer.