SERVICE

Service solutions

At Edwards we pride ourselves on developing service solutions that deliver optimum performance and up-time to our customers. Convenience, quality and value are at the heart of everything we do.

service solutions
from EDWARDS

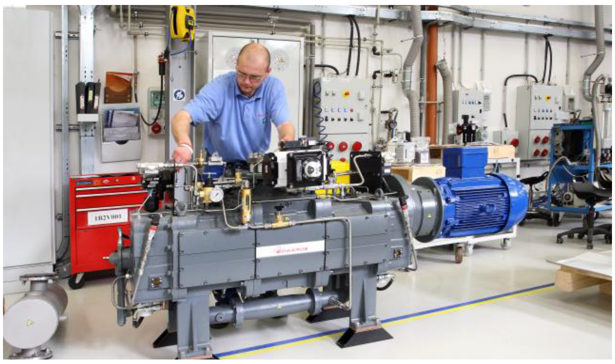
Convenience, Quality and Value

Whether you are looking for immediate help and advice or require a long term total service partner, we make the performance of your business our priority. Our range of services include:

- Upgrades and optimisation
- Product repair and remanufacturing
- Service exchange
- Replacement parts, kits and tooling
- Certified (preowned equipment)
- On-site services
- Managed maintenance agreements.

Managed Maintenance

Managed Maintenance is all about easy access to the right services at the right time. Regular scheduled maintenance is crucial to identifying potential problems before they occur. Avoiding unplanned downtime is the key to achieving outstanding operational savings. Our qualified service engineers can help you monitor and maintain your vacuum system to avoid one-off costly repairs while managing service on a fixed budget.



For any business the ability to plan ahead is key. Our Managed Maintenance approach provides the tools for you to do so in confidence. Optimising service events around the needs of your business will reduce your total cost of ownership and increase performance with:

- Reduced maintenance cost
- No unplanned stoppages
- A pre-set service budget
- Original spares and accessories
- Access to Best Known Methods.

A Managed Maintenance plan enables simple budgeting and cost management: the most cost effective way to maintain your Edwards vacuum equipment.

Product Repair & Remanufacturing

When product repair or remanufacture is required, nothing can match the feeling of confidence gained from having the work completed by the original manufacturer. Our global network of ReManufacturing centres offers a complete range of product repair, overhaul and remanufacturing solutions, governed by tested working practices and a painstaking attention to detail.

Whether you choose a fixed price service for swift response and simple budgeting, or a more flexible option for greater cost control, you can expect the exceptional quality that only the manufacturer can deliver.

Replacement Parts, Kits and Tooling

Genuine Edwards Replacement Parts are produced in the same factories as our new products. Replacement parts are always produced to the latest product standards, helping you get the job done right the first time, every time. To ease routine tasks we offer specific kits tailored to facilitate the periodic maintenance your equipment will require. Using genuine Edwards parts kits will allow your maintenance team to start work with all the materials they need to complete the job, saving time, reducing cost, and extending the life of your product for years of trouble free operation.

Service Exchange

When process uptime is critical, or it's simply not convenient to perform repair or maintenance work on site, you need to consider Edwards Service Exchange. This solution provides a rapid product replacement with an extensive, long warranty. You are then free to replace your existing pump and return it to us at your convenience. The program is backed by an extensive inventory, strategically held at our global locations to enable a reliable and effective response to your requirements. Please contact Edwards in the first instance to ensure product availability before ordering.

Onsite Services

Providing Service at our customers' sites is something that we take very seriously. We invest in the tools, training, inventory and operational excellence to enable our teams of vacuum and abatements specialist to deliver quality service in a consistent and safe manner. Our excellent safety performance is routinely recognised by our customers.

- Product installation and commissioning
- Product orientation and training
- Single visits to embedded teams
- Upgrades providing improved performance and efficiency
- Mobile vacuum expert providing a localised support network
- Scheduled monitoring, preventative and predictive maintenance, breakdown support
- Logistics management to optimise availability and supply chain
- Emergency hotline and service support, including availability outside of normal working hours
- Local, regional and global agreements, flexible and integrated with your support network.

In-service Enhancements

Upgrading or optimising your existing vacuum equipment is a cost effective way to take advantage of Edwards' latest technology and know-how. We can offer upgrade options for many brands of equipment, allowing you to benefit from enhanced performance, energy efficiency, and greatly improved cost of ownership. Through continuous improvement and optimisation programmes, we utilise know-how derived from our global installed base to help you enhance your process efficiency and reduce your Total Cost of Ownership (TCO).

- Innovative products and upgrades reduce carbon footprint to optimise environmental performance
- Simple single equipment retrofit kits or full facility wide turnkey programmes offering high return on investment (ROI)
- Technical upgrades, and system optimisation for product and process yield improvements
- Sophisticated modelling and simulation, validated against our global knowledge base
- Remote diagnostics and prognostic condition monitoring via the latest EdCentra solutions packages.

Certified Products

Edwards Certified Products are pre-owned units, overhauled and carefully remanufactured in one of our dedicated service facilities. Skilled technicians use genuine Edwards' parts, and follow factory procedures in order to restore equipment and ensure it meets original performance specifications. Certified products offer a cost effective and sustainable solution for acquiring Edwards' vacuum and abatement equipment.

Certified products are supplied with the accessories required to install your product straight out of the box, as well as full instructions for installation and usage. We hold an extensive inventory of Certified pumps, strategically positioned at our global locations. Due to the rapidly changing nature of the used equipment market please contact Edwards in the first instance to ensure product availability before ordering.

Consistent and reliable standards wherever you are

We develop or manufacture the training, processes, tooling and parts used throughout our service network at the factories where we develop and manufacture our products. This is why our service team is always ready to deliver quality support. As you would expect from a responsible, global company, we operate under ISO9001, ISO14001 and OHSAS 18001 accreditation.

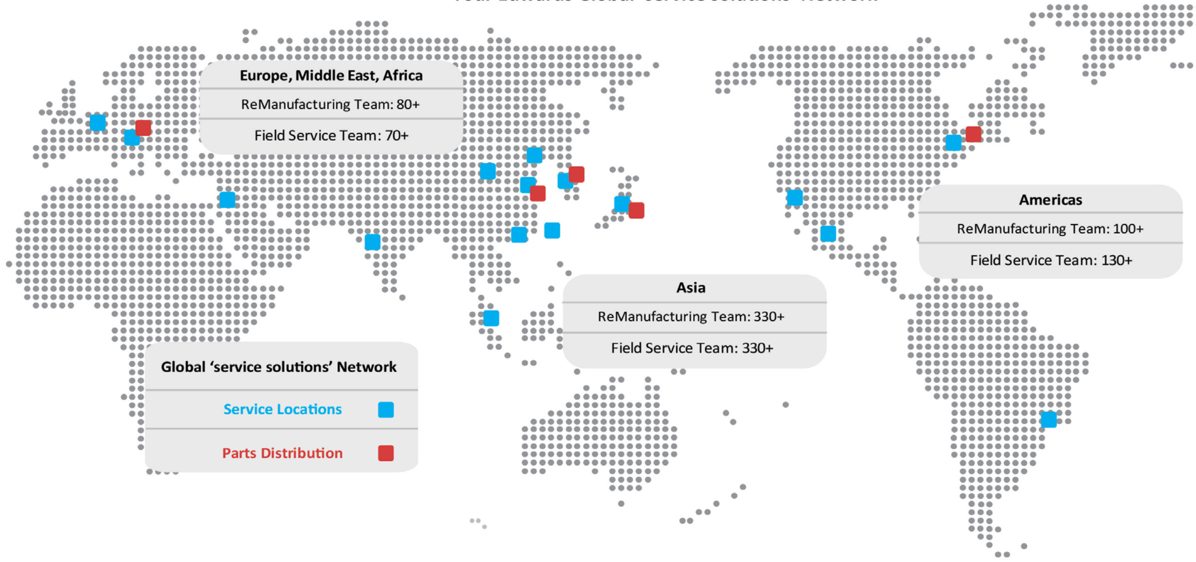
Your Global Partner

We understand the importance of local support. Edwards has a number of major service facilities located throughout the world, backed up by an extensive team of engineers and technicians to provide the support you need. From Edwards you can expect a local, rapid response and great value service, delivered by the experts.

Global Support from Edwards

Our worldwide network of around 1000 service personnel is easily and simply accessed through your local Edwards office.

Your Edwards Global ‘service solutions’ Network



www.edwardsvacuum.com/service

Location	Contact Telephone Number	Contact Email
United Kingdom	+44 (0)1293 842202	Aftersales@edwardsvacuum.com
Ireland		
Benelux		
Austria		
Switzerland		
Poland		
Czech Republic		
Russia		
Eastern Europe		
Middle East		
South Africa		
Germany	+49 (0)800 000 1457	DEservice@edwardsvacuum.com
Italy	+39 (0)863 509516	ITmanutenzione@edwardsvacuum.com
France, North Africa	+33 (0) 1 47 98 24 01	FRserviceapresvente@edwardsvacuum.com
Israel	+(972) 7 681 0633	Edwards.israel@edwardsvacuum.com
Americas (except Brazil)	+(1) 1 800 848 9800	Edwardsstokesservice@edwardsvacuum.com
Brazil	+ 55 11 3952 5000	Service@edwardsvacuum.com.br
SE Asia, Australasia	+(65) 6546 8408	Customer.careSG@edwardsvacuum.com
Korea	+(82) 41 621 7070	Infokorea@edwardsvacuum.com
Taiwan ROC	+886-37-581000	Customer.CareTW@edwardsvacuum.com
Peoples Republic of China and SAR	+(86) 21 5866 9618 x25	CareSHA.Customer@edwardsvacuum.com
Japan	+81-47-458-8853	Edj.service@edwardsvacuum.com
India	+91-20-40752210	India@edwardsvacuum.com

Guide to Pump Selection and Pipe Installation

Our experienced applications team are trained to provide expert advice on specifying the correct pumping system. Please contact your local Edwards office for further details.

Rotary Pump Speed and Pump-Down Time Calculations

To estimate the pump speed you need to reach a given system pressure, P:

S = (F × V)/t (1)

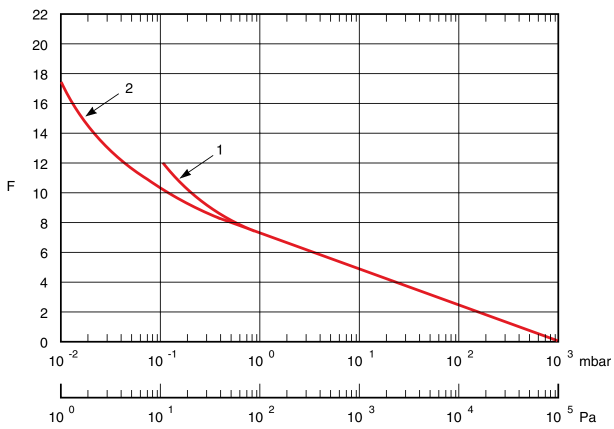
To estimate the time to pump-down your system to a given pressure, P:

t = (F × V)/S (2)

where t is the pump-down time
F is the pump-down factor at pressure P
V is the volume of the vacuum system
S is the speed of the rotary pump

Read F from Figure 1. t, V and S must be in consistent units: for example, t in hours, V in cubic metres (m3) and S in cubic metres per hour (m^3h^{-1}).

Speed and Power Curves



1 One-stage rotary pump
2 Two-stage rotary pump or pump combination
Figure 1 – Pump-down factor, F, as a function of system pressure, mbar

F applies a correction for the change in the speed of rotary pumps as the inlet pressure decreases. But F does not include a correction for the effect of conductance of inter-connecting pipes (refer to the section below if you want to apply this correction). These calculations apply to clean and leak tight vacuum systems. It is difficult to extend these curves to below 0.1 mbar, because the effect of system design and out-gassing become increasingly important at lower pressures. For example, you have a 0.06 m3 (60 l) vacuum system that you must evacuate to 1 mbar in 0.05 hr (3 minutes). From Figure 1, at 1 mbar F = 7.

S = (F × V)/t = (7 × 0.06)/0.05 = 8.4 m^3h^{-1}

So, you require a pump with a minimum speed of 8.4 m^3h^{-1} and an ultimate vacuum well below 1 mbar. Edwards RV8 pump is suitable for this application.

Effect of the Conductance of Connection Pipes

Resistance to flow of gases and vapours through pipes can significantly affect the size of pump you require or the pump-down time you can achieve with a given pump. If you know the dimensions of the pipes in your system, you can correct the speed and pumpdown time calculations. The conductance of 1 m lengths of pipes of various diameters is shown in Figure 2. Please note these limitations for the data in this graph. The data shown in the dotted portions of the curves applies only to low velocity, viscous, laminar flow in long pipes (where the length of the pipe is typically many 100 times the pipe diameter). This data does not apply to turbulent flow (when the pipe conductance may be significantly reduced) or to compressed gases (such as gases in short pipes or subject to high speed flows).
If your calculations are for short pipes (where the length of the pipe is typically < 100 times the pipe diameter), or for pipe diameters and pressures shown by the dotted portions of the curves in Figure 2, please refer to Wutz1 or Dushman2, or contact Edwards for advice.

Speed and Power Curves

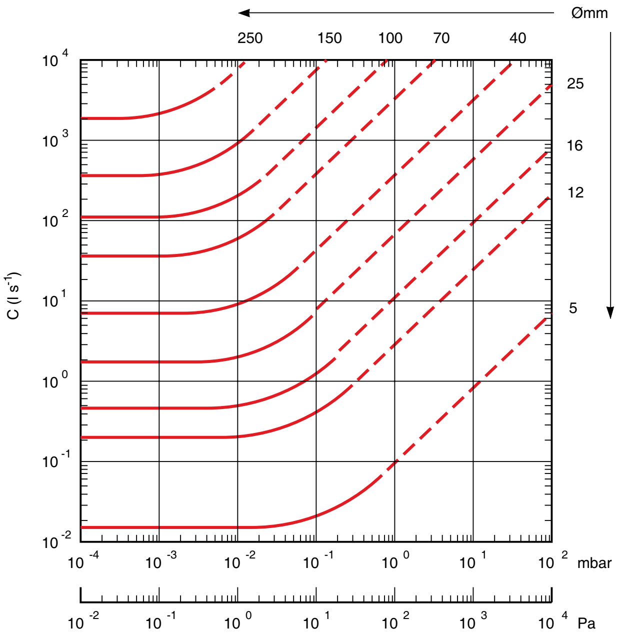


Figure 2 – *Conductance of 1m of round pipe, for air at 20 ˚C (the data shown in the dotted portions of the curves is for low velocity, viscous, laminar flow in long pipes)*

The conductance of a pipe at a given pressure is:

Cp = C/l

where Cp is the conductance of the pipe,
C is the conductance per metre, read from Figure 2,
l is the length of the pipe in metres.

Then, you can use the value for Cp to correct the pumping speed at the end of the pipe when it is connected to the pump inlet; use this equation:

1/Sp = (1/S) + (1/Cp) or Sp = (Cp × S)/(Cp + S) (3)

where Sp is the pumping speed at the end of the pipe,
S is the speed of the pump.

Use a similar procedure to make an approximate correction to the pump-down time calculation. First, read the value of C at the required system pressure from Figure 2, and calculate Cp for your pipe at that pressure. Then use the pump speed, S, and Cp in equation (3) to calculate the corrected speed, Sp. Use this value of Sp in equation (2) to estimate the pump-down time, t.

If you use a narrow pipe between the pump and the process chamber, this restricts the effective pumping speed. It is usually more economical to use a wider or shorter pipe and a smaller pump, than to restrict the pumping speed of a larger pump. You should aim at the effective pumping speed to be 80% or more of the pump's speed. You can use equation (3) and the graph in Figure 2 to select the minimum size of the pipe you need. For example, you need a pumping speed of 150 m^3h^{-1} at 1.0 mbar in your process chamber, and the pump must be 6 m away from the chamber. The E2M175 (135 m^3h^{-1} at 1 mbar) is too small for this application, even without losses in the pipelines. So, consider the E2M275 pump which has a pump speed of 230 m^3h^{-1}. Use equation (3) to calculate the minimum conductance of the connecting pipe:

Cp = (S × Sp)/(S – Sp) = (230 × 150)/(230 – 150)
= 430 m^3h^{-1}

The conductance per metre is then 430 × 6 = 2580 m^3h^{-1}. In Figure 2, the nearest larger diameter pipe that has a conductance of 2580 m^3h^{-1} or more at 1.0 mbar is 70 mm. Conveniently, this is the same diameter as the inlet of the E2M275 pump.

Maximum Pipe Length for Increase in Pump-Down Time of < 20%

Table 1 gives a quick guide to the maximum length of pipe you can use to connect the pump to your vacuum system, if you want the conductance of the pipe to contribute no more than 20% to the pumpdown time.

In our calculations, we assumed that the pipes and fittings used correspond to the size of the inlet port. That is, for example, that NW25 pipes and fittings are used for the RV pumps. If you use smaller pipes and fittings, the pump-down times will be increased significantly.

How to choose a Rotary Pump to back a vapour pump

We recommend that you use two-stage rotary pumps (such as the RV5 or the E2M18 pumps) to back vapour pumps. When a vapour pump operates at its maximum specified throughput, the backing pressure must not be higher than 0.5 times the critical backing pressure. Note that the maximum throughput of most vapour pumps is calculated at 1×10^{-2} mbar: the maximum throughput of vapour booster pumps is calculated at 1 mbar. Use this equation to calculate the required rotary pump speed:

$$S > tm/(0.5 \times Pcb)$$

where S is the speed of the rotary pump,
tm is the maximum throughput of the vapour pump,
Pcb is the critical backing pressure of the vapour pump.

For example, at 1×10^{-2} mbar and a corresponding speed of 60 ls^{-1} , the maximum throughput of the Diffstak 100/300 pump is $60 \times 10^{-2} = 0.6$ mbar ls^{-1}. The critical backing pressure of this pump with Santovac® 5 fluid is 0.6 mbar. So, the required rotary pump speed is:

$$S > 0.6/(0.5 \times 0.6) = 2\ ls^{-1} \sim 8\ m^3h^{-1}$$

Pump model	Pump inlet	Inlet Ø (mm)	Maximum pipe length (m) for pump-down to			
			1 mbar		0.1 mbar	
			50 Hz	60 Hz	50 Hz	60 Hz
Speedivac 2	¼ inch BSP	12	4	3.5	-	-
E2M0.7	NW10	10	6	5	0.7	0.6
E2M1, E2M1.5	NW10	10	3	2.5	0.3	0.3
RV3	NW25	25	50	45	7	6
RV5	NW25	25	35	30	4.5	3.5
RV8	NW25	25	22	19	3	2
RV12	NW25	25	16	14	2	1.5
E1M18, E2M18	NW25	25	11	9	1.5	1
E2M28	NW25	25	8	6.5	1	0.8
E2M40	ISO40	40	26	24	2.5	2
E2M80	ISO40	40	16	13	1.5	1
E2M175	ISO63	70	31	28	4	3.5
E2M275	ISO63	70	25	21	3.5	2.5

Table 1 – Maximum pipe lengths, for an increase in pump-down time of < 20%

The nearest larger, two-stage rotary pump suitable for this application with no correction for pipe conductance effects) is the RV8. If the maximum throughput for your system is lower than the pump's specified maximum throughput, you may be able to use a smaller rotary pump: please contact Edwards for advice. You must now check that the rotary pump you have selected can pump-down your vacuum system from atmospheric pressure to the critical backing pressure in an acceptable time. If it cannot, you may need to choose a larger rotary pump.

How to choose a Rotary Pump to back a Turbomolecular Pump

We recommend that you use two-stage rotary pumps (such as the RV5 or the E2M18 pumps) or scroll pumps to back turbomolecular pumps. The size of the rotary pump you need depends on the maximum backing pressure and the speed of the turbomolecular pump at your required system pressure:

$$S > (St \times P)/(0.5 \times Pmb)$$

where S is the speed of the rotary pump,
St is the speed of the turbomolecular pump, at your required system pressure P,
Pmb is the maximum backing pressure of the turbomolecular pump.

For conventional turbomolecular pumps, the maximum backing pressure is typically 0.1 mbar: for compound turbomolecular pumps, it is about 5 mbar. For example, you require a system pressure of 1×10^{-4} mbar with a conventional 200 ls^{-1} turbomolecular pump. The required rotary pump speed is:

$$S > (200 \times 10\text{-}4)/(0.5 \times 0.1) = 0.4 \text{ l s-1} \sim 1.44 \text{ m}^3\text{h}^{-1}$$

So, you need a rotary pump with a speed, at 0.1 mbar, of 1.44 m^3h^{-1}. The nearest larger, two-stage, rotary pump suitable for this application (with no corrections for pipe conductance affects) is the RV3. You must now check that the rotary pump you have selected can pump-down your vacuum system from atmospheric pressure to the critical backing pressure in an acceptable time. If it cannot, you may need to choose a larger pump. This is particularly important if you use a compound turbomolecular pump: the higher maximum backing pressure of these pumps mean that you can use a smaller backing pump. Note that, in all applications you will achieve a lower ultimate pressure (lower P) if you use a larger backing pump. If you want to pump hydrogen or helium, these calculations may not apply: please contact Edwards for advice.

Effect of the Pipe between the Secondary Pump and the Rotary Pump

As we discussed above, the conductance of the pipe between the rotary pump and the secondary pump can reduce the effective pumping speed. This may mean that the critical backing pressure of the secondary pump is exceeded, even though the unrestricted speed of the rotary pump is adequate. If you know the bore and length of the pipe between the rotary pump and the secondary pump, you can use equation (3) and the data in Figure 2 to calculate the pumping speed at the end of the pipe. Then, match this corrected speed to the maximum throughput of the secondary pump.

Pump Model	Pump Inlet	Inlet Ø(mm)	Maximum Pipe Length (m)	
			50 Hz	60 Hz
Speedivac 2	¼ inch BSP	12	0.8	0.8
E2M0.7	NW10	10	0.7	0.7
E2M1, E2M1.5	NW10	10	0.4	0.4
RV3	NW25	25	7	6
RV5	NW25	25	4	3.5
RV8	NW25	25	2.5	2
RV12	NW25	25	1.5	1.5
E1M18, E2M18	NW25	25	1	1
E2M28	NW25	25	0.8	0.7
E2M40	IS040	40	3.5	3.5
E2M80	ISO40	40	2	1.5
E2M175	IS063	70	7	7
E2M275	ISO63	70	4.5	4.5

Table 2 – Maximum pipe lengths, for an increase in pump-down time of < 20%

Alternatively, in Table 2, we give a quick guide to the maximum length of pipe you can use between the rotary and secondary pumps, if you want the reduction in pump speed at 0.5 m pipes and fittings are used for the RV pumps. If you use smaller pipes and fittings, you must use shorter pipes.

Conversions

Pressure Units

	mbar	bar	Torr	Pa (Nm^{-2})	atm	lbf $inch^{-2}$
1 mbar =	1	1 x 10^{-3}	0.75	10^2	9.87 x 10^{-4}	1.45 x 10^{-2}
1 bar =	10^3	1	7.5 x 10^2	1 x 10^5	0.987	14.5
1 Torr =	1.33	1.33 x 10^{-3}	1	1.33 x 10^2	1.32 x 10^{-3}	1.93 x 10^{-2}
1 Pa (Nm^{-2}) =	0.01	1 x 10^{-5}	7.5 x 10^{-3}	1	9.87 x 10^{-6}	1.45 x 10^{-4}
1 atm =	1.01 x 10^3	1.01	7.6 x 10^2	1.01 x 10^5	1	14.7
1 lbf $inch^{-2}$ =	68.9	6.89 x 10^{-2}	51.71	6.89 x 10^3	6.80 x 10^{-2}	1
1 kgf cm^{-2} =	9.81 x 10^2	0.98	7.36 x 10^2	9.81 x 10^4	0.97	14.2
1 inch Hg =	33.9	3.39 x 10^{-2}	25.4	3.39 x 10^3	3.34 x 10^{-2}	0.49
1 mm Hg =	1.33	1.33 x 10^{-3}	1	1.33 x 10^2	1.32 x 10^{-3}	1.93 x 10^{-2}
1 inch H_2O =	2.49	2.49 x 10^{-3}	1.87	2.49 x 10^2	2.46 x 10^{-3}	3.61 x 10^{-2}
1 mm H_2O =	9.81 x 10^{-2}	9.81 x 10^{-5}	7.36 x 10^{-2}	9.81	9.68 x 10^{-5}	1.42 x 10^{-3}

	kgf cm^{-2}	inch Hg	mm Hg	inch H2O	mm H2O
1 mbar =	1.02 x 10^{-3}	2.95 x 10^{-2}	0.75	0.40	10.2
1 bar =	1.02	29.53	7.5 x 10^2	4.01 x 10^2	1.02 x 10^4
1 Torr =	1.36 x 10^{-3}	3.94 x 10^{-2}	1	0.54	13.6
1 Pa (Nm^{-2}) =	1.02 x 10^{-5}	2.95 x 10^{-4}	7.5 x 10^{-3}	4.01 x 10^{-3}	0.10^2
1 atm =	1.03	29.92	7.6 x 10^2	4.07 x 10^2	1.03 x 10^4
1 lbf $inch^{-2}$ =	7.03 x 10^{-2}	2.04	51.71	27.68	7.03 x 10^2
1 kgf cm^{-2} =	1	28.96	7.36 x 10^{-2}	3.94 x 10^2	1 x 10^4
1 inch Hg =	3.45 x 10^{-2}	1	25.4	13.6	3.45 x 10^2
1 mm Hg =	1.36 x 10^{-3}	3.94 x 10^{-2}	1	0.54	13.60
1 inch H_2O =	2.54 x 10^{-3}	7.36 x 10^{-2}	1.87	1	25.4
1 mm H_2O =	10^{-4}	2.90 x 10^{-3}	7.36 x 10^{-2}	3.94 x 10^{-2}	1

Note also: 1 dyn cm^{-2} (barye) = 0.1 Pa (Nm^{-2}) = 10^{-3} mbar

Leak Rate Units

	mbar ls^{-1}	Torr ls^{-1}	atm cm^3 s^{-1}	lusec	atm ft^3min^{-1}
1 mbar ls^{-1} =	1	0.75	0.99	7.5 x 10^2	2.09 x 10^{-3}
1 Torr ls^{-1} =	1.33	1	1.32 x 10^3	103	2.79 x 10^{-3}
1 atm cm^3 s^{-1} =	1.01	0.76	1	7.6 x 10^2	2.12 x 10^{-3}
1 lusec =	1.33 x 10^{-3}	1 x 10^{-3}	1.32 x 10^{-3}	1	2.79 x 10^{-6}
1 atm ft^3min^{-1} =	4.78 x 10^2	3.59 x 10^2	4.72 x 10^2	3.59 x 10^5	1

Pumping Speed Units

	ls^{-1}	l min^{-1}	ft^3min^{-1}	m^3h^{-1}
1 ls^{-1} =	1	60	2.119	3.60
1 l min^{-1} =	0.017	1	0.035	0.06
1 ft^3min^{-1} =	0.472	28.317	1	1.699
1 m^3h^{-1} =	0.278	16.667	0.589	1

Material Safety Data Sheets

The following data sheets are available on request

- P110-11-000 Mechanical pump oil - Supergrade
- P110-20-100 Oil Apiezon® AP303
- P120-01-000 Mechanical pump oil – 45
- P120-01-005 Mechanical pump oil – TW
- P120-01-010 Mechanical pump oil – Ultragrade 15, 19, 20, 70
- P120-01-030 Drynert 25/6, gear box lubricant
- P120-01-050 Synfilm GT Oil
- P120-02-000 Oil – Apiezon® A, AP201, B, BW, C & G
- P120-02-005 Oil – Apiezon® J & K
- P120-02-010 Oil – Apiezon® AP301
- P120-02-015 Diffusion pump fluid – DC702, 704EU & 705
- P120-02-025 Diffusion pump fluid – Edwards L9
- P120-03-000 Grease – Fomblin® (AR555)
- P120-03-005 Grease – Krytox® series 240 & LVP fluorinated greases
- P120-03-010 Grease – Apiezon® H & T
- P120-03-015 Grease – Apiezon® L & M
- P120-03-025 Grease – Apiezon® AP101
- P120-03-030 Grease – Apiezon® AP100
- P120-03-035 Grease – Silicone high vacuum
- P120-03-040 Fomblin® CR 861
- P120-03-045 DEFRIC COAT D1-C
- P120-03-050 DEFRIC COAT D1-C solvent
- P120-04-000 Wax – Apiezon® W & W40
- P120-04-005 Wax – Sealing compound Apiezon® Q
- P120-04-015 O-rings – Viton®
- P120-04-020 O-rings – Nitrile & rubber vacuum
- P120-04-025 O-rings – Kalrez®
- P120-04-030 Indium metal seals
- P120-04-035 O Rings – Fluoroelastomer (VAT)
- P120-05-000 GS battery
- P120-05-005 Grease – Asonic GHY72
- P120-06-000 Coolant – Edwards Drystar® 2
- P120-06-005 Coolant – HT110
- P120-07-000 Refrigerant – Edwards chiller (SUVA HP62)
- P120-08-000 GRC cartridges – C150Y/C150R/C150JV/ C150W/CM10Y
- P120-08-005 End point detector fluid
- P120-08-010 Pipe insulation jackets
- P120-08-015 Thermal processing/conditioning system TPU-TCS
- P120-08-020 GRC cartridges – C150A/C7150A
- P120-08-025 GRC cartridges – C250Y
- P120-09-000 Alumina grade A (activated alumina)
- P120-09-005 Activated charcoal AC35
- P120-09-010 Rotary pump blade material – CX2
- P120-09-020 Rotary pump blade material – GE21
- P120-09-025 Polytetrafluoroethylene PTFE
- P120-10-000 Leak detection/ion gauge filaments
- P120-11-010 V Lube B
- P120-11-020 V Lube F US version
- P120-11-025 V Lube F European version
- P120-11-030 V Lube G
- P120-11-040 V Lube H
- P120-11-080 Heat transfer fluid
- P120-11-100 Sealant – silicone liquid gasket
- P120-11-110 Cartridge grease – Shell Darina® EP grease 2
- P120-20-010 1-Methoxy-2-Propanol
- P120-20-020 Emarald lacquer
- P120-20-030 Emarald primer
- P120-20-040 Isopropanol anhydrous
- P120-20-050 Potassium hydroxide solution
- P120-20-060 Visioncoat 2000
- P120-20-070 Visioncoat 2000 solvent
- P120-20-080 Optical 10L fluid
- P120-20-090 Super II fluid
- P120-20-100 Hexid fluid
- P120-20-110 In-situ hydrophobic monomer
- P120-20-130 Exchange carbon
- P120-20-140 Exchange resin
- P120-20-160 Zirconium
- P120-30-010 XDS black tip seal dust
- P120-30-015 XDS light brown tip seal dust
- P120-40-020 Sodium fluoride
- P120-40-060 Aquareus ion exchange resin
- P120-70-005 Rotary pump blade material -F43
- P120-70-010 Rotary pump blade material -F32

Trademarks

Edwards, Diffstak, Drystar, Speedivac are trademarks of Edwards Limited.

Notice – Dimensions

Although every care has been taken in the preparation of dimensional drawings no responsibility can be taken for customers' work processed from this catalogue. Unless otherwise stated all dimensions are in mm (inches).

Notice – Accessories

Accessories are occasionally included in illustrations and dimension drawings for clarity or convenience. In general this is indicated on the drawing or in the adjacent text but in the case of doubt, please verify the status of such components before ordering.

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