MEDIUM AND LARGE OIL SEALED PUMPS

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE

Medium and Large Oil Sealed Pumps and Systems

- ES Single Stage Oil Sealed Rotary Vane Pumps
- E2M Two Stage Oil Sealed Rotary Vane Pumps
- Stokes Microvac Oil Sealed Rotary Piston Pumps

Edwards believes in delivering results that bring value to our customers by using our breath of industry experience to identify and apply solutions to your problems. Using the most up-to-date and innovative modelling techniques, and selecting the right pumps from a wide range of dry and wet products, we can optimise the pumping configuration to provide a system design giving the maximum performance in the most reliable and cost effective way.

Edwards is providing a wide range of wet pumps to suit the requirements of customers carefully looking to a good ratio between process results and investment cost.

Product ranges

The ES Single Stage Oil Sealed Rotary Vane Pump range provides a good ultimate vacuum performance in sizes from 65 to 630 m^3h^{-1} ES represents a step ahead in single stage oil technology with class leading ultimate vacuum level and extended operating pressure range.

The E2M Two Stage Oil Sealed Rotary Vane Pump is the tried and tested solution for applications when better ultimate vacuum down to 10^{-3} mbar is needed. Available in sizes from 40 to 275 m^3h^{-1} features a robust design for reliable and stable high vacuum performance

The Stokes Microvac Oil Sealed Rotary Piston Pump Range, available in sizes from 255 to 1240 m^3h^{-1}, features a rugged design for robust and reliable operation even in the harshest processes. With over 80 years of time tested proven performance Stokes Microvac low rotational speed and simple mechanism has demonstrated longest pump life cycle, high reliability and ease of rebuild.

ES ROTARY VANE PUMP

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE

The Edwards ES range of pumps represents the advanced single stage oil sealed rotary vane pumps. The pump mechanism has been refined to produce a better quality of vacuum. It extends the pressure range over which the pump operates giving an unrivalled ultimate vacuum level. The vacuum performance is stable without the pressure fluctuations that are often seen in single stage pumps. Extended service intervals and easy in-house maintenance make the ES range a flexible vacuum solution for a wide range of industrial applications. The ES range of pumps is designed to be used in a wide range of industrial applications. They can be used individually or with mechanical booster pumps to increase both performance and ultimate vacuum.

Features and Benefits

Enhanced performance – class leading ultimate vacuum level and extended operating pressure range.

Stability – stable vacuum performance, with no pressure fluctuations.

Convenience – combined ISO/BSP connection, easily serviceable on site.

Flexibility – use individually or with mechanical booster pumps, for a wide range of applications.

Simple and easy – fully assembled package with EH boosters, suits a variety of performance requirement.

Applications

- Heat treatment.
- Drying.
- Coating.
- General industrial.

Pump Range

ES

- ES65
- ES100
- ES200
- ES300
- ES630

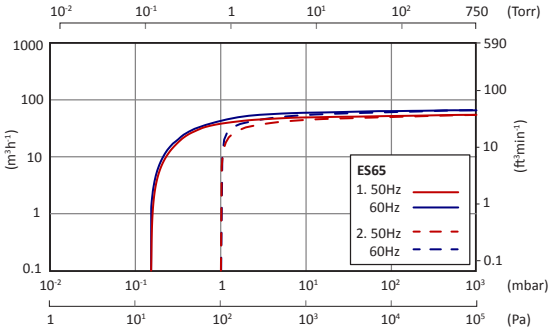
Performance Curves

ES65 Rotary Vane Pump

ES65

Pumping speed	
50 Hz	59 m^3h^{-1}
	35 cfm
60 Hz	70 m^3h^{-1}
	41 cfm
Ultimate vacuum	
With gas ballast	1 mbar
Without gas ballast	0.15 mbar

ES65 Performance Curve



Ordering information

Product description	Order no.
ES65 Asia 200 V (50/60 Hz) & 380 V (60 Hz) IE3	A35247934
ES65 EU/US/CN 380-400 V(50 Hz) & 230/460 V (60 Hz) IE3	A35247940

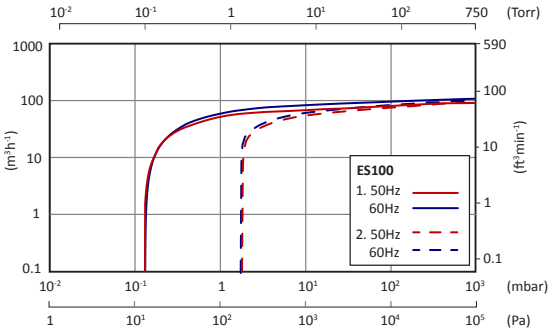
1	Without gas ballast
2	With gas ballast

ES100 Rotary Vane Pump

ES100

Pumping speed	
50 Hz	90 m^3h^{-1}
	53 cfm
60 Hz	105 m^3h^{-1}
	62 cfm
Ultimate vacuum	
With gas ballast	2 mbar
Without gas ballast	0.15 mbar

ES100 Performance Curve



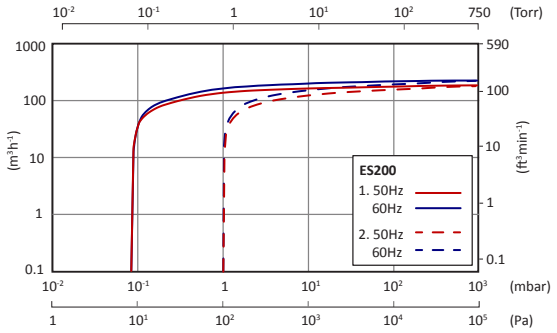
Ordering information

Product description	Order no.
ES100 Asia 200 V (50/60 Hz) & 380 V (60 Hz) IE3	A35252934
ES100 EU/US/CN 380-400 V (50 Hz) & 230/460 V (60 Hz) IE3	A35252940

1	Without gas ballast
2	With gas ballast

ES200 Rotary Vane Pump

ES200 Performance Curve



1	Without gas ballast
2	With gas ballast

ES200

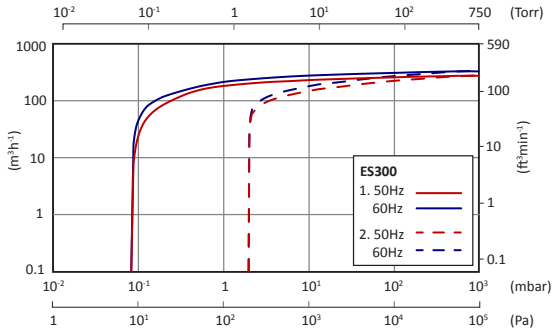
Pumping speed	
50 Hz	190 m^3h^{-1}
	112 cfm
60 Hz	225 m^3h^{-1}
	132 cfm
Ultimate vacuum	
With gas ballast	1 mbar
Without gas ballast	0.08 mbar

Ordering information

Product description	Order no.
ES200 Asia 200 V (50/60 Hz) & 380 V (60 Hz) IE3	A35257934
ES200 EU/US/CN 380-400 V (50 Hz) & 230/460 V (60 Hz) IE3	A35257940

ES300 Rotary Vane Pump

ES300 Performance Curve



1	Without gas ballast
2	With gas ballast

ES300

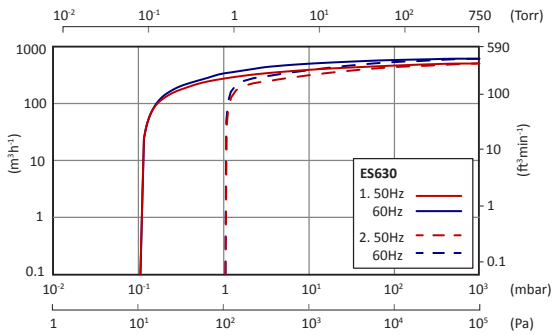
Pumping speed	
50 Hz	275 m^3h^{-1}
	162 cfm
60 Hz	320 m^3h^{-1}
	188 cfm
Ultimate vacuum	
With gas ballast	2 mbar
Without gas ballast	0.08 mbar

Ordering information

Product description	Order no.
ES300 Asia 200 V (50/60 Hz) & 380 V (60 Hz) IE3	A35262934
ES300 EU/US/CN 380-400 V (50 Hz) & 230/460 V (60 Hz) IE3	A35262940

ES630 Rotary Vane Pump

ES630 Performance Curve



1	Without gas ballast
2	With gas ballast

ES630

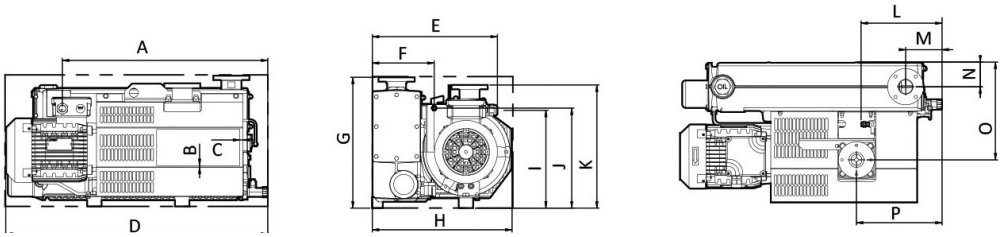
Pumping speed	
50 Hz	575 m^3h^{-1}
	338 cfm
60 Hz	674 m^3h^{-1}
	397 cfm
Ultimate vacuum	
With gas ballast	1 mbar
Without gas ballast	0.1 mbar

Ordering information

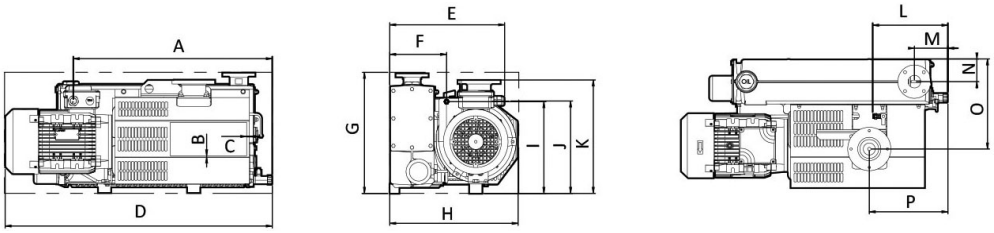
Product description	Order no.
ES630 Asia 200 V (50/60 Hz) & 380 V (60 Hz) IE3	A35267934
ES630 EU/US/CN 380-400 V(50 Hz) & 230/460 V (60 Hz) IE3	A35267940

Dimensions

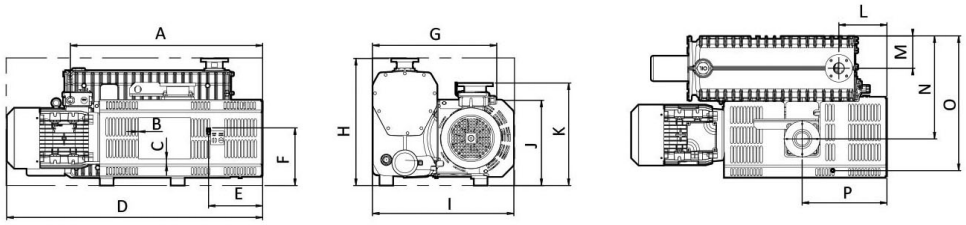
ES65 dimensions



ES100 dimensions

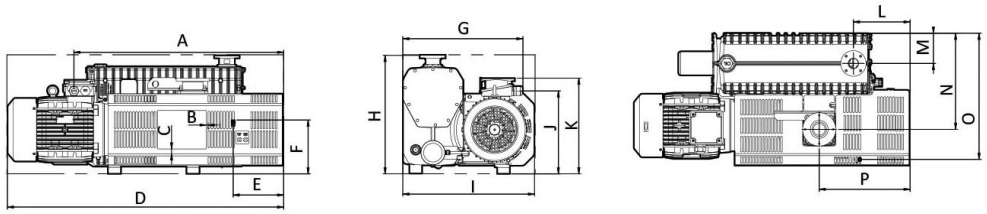


ES200 dimensions

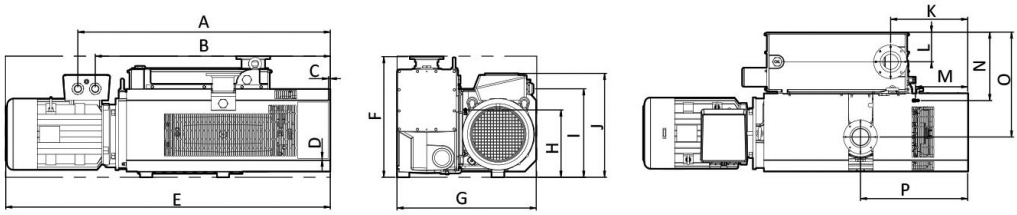


mm (inches)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
ES65	568 (2236)	3.8 (0.15)	8.6 (0.34)	725.5 (28.56)	346 (13.62)	171 (6.73)	361 (14.21)	387 (15.24)	270 (10.63)	276 (10.87)	340 (13.39)	224 (8.82)	101 (3.98)	68 (268)	270 (10.63)	237 (9.33)
ES100	600.5 (23.64)	3.8 (0.15)	8.6 (0.34)	810 (3188)	353 (13.89)	171 (6.73)	361 (14.21)	387 (15.24)	275 (10.83)	277 (10.9)	340 (13.39)	226 (8.9)	101 (3.98)	68 (268)	270 (10.63)	237 (9.33)
ES200	714 (28.11)	2.8 (0.11)	19 (0.75)	990 (39.01)	198 (7.8)	210 (8.27)	471 (17.87)	462 (18.19)	517 (20.35)	323 (1271)	373 (14.69)	176 (6.93)	118 (4.65)	373 (14.69)	490 (19.29)	310 (12.2)

ES300 dimensions



ES630 dimensions



mm (inches)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
ES300	822 (32.36)	7.4 (0.29)	19 (0.75)	1103 (43.42)	198 (7.8)	210 (8.27)	471 (18.54)	462 (18.19)	517 (20.35)	323 (12.71)	373 (14.69)	222 (8.74)	118 (4.65)	375 (14.76)	492 (19.37)	356 (14.02)
ES630	1234 (48.58)	1149 (45.24)	9 (0.35)	8 (0.31)	1649 (64.92)	589 (23.19)	681 (26.81)	329 (1295)	432 (17.01)	507 (19.96)	377 (14.84)	145 (5.71)	225 (8.86)	334 (13.15)	512 (20.16)	524 (20.63)

Technical Data

	Units	ES65	ES100	ES200	ES300	ES630
			Maximum displacement			
50 Hz	m^3h^{-1}/cfm	64/38	96/56	198/117	293/172	635/374
60 Hz	m^3h^{-1}/cfm	77/45	115/68	240/141	354/208	769/453
			Pumping speed			
50 Hz	m^3h^{-1}/cfm	59/35	90/53	190/112	275/162	575/338
60 Hz	m^3h^{-1}/cfm	70/41	165/62	225/132	320/188	674/397
Ultimate vacuum (total pressure) no gas ballast	mbar/Torr	0.15/0.11		0.08/0.06		0.1/0.08
Ultimate vacuum (total pressure) with gas ballast	mbar/Torr	1/0.8	2/15	1/0.8	2/15	1/0.8
Inlet connection		ISO40/1" BSP		ISO63/2" BSP		ISO100/3" BSP
Outlet connection		ISO40/11/2" BSP		ISO40/2" BSP		ISO100/3" BSP
Max permitted outlet pressure	bar gauge	0.5				
			Max water vapour pumping rate			
50 Hz	kgh^{-1}/lbh^{-1}	1.3/2.8	2.6/5.7	2.2/4.8	2.3/5.1	5.6/12.3
60 Hz	kgh^{-1}/lbh^{-1}	1.6/3.5	4.3/9.4	2.8/6.7	3/6.6	8.1/17.8
Weight	kg/lb	77/170	94/207	163/359	185/408	4516/1138
Motor protection rating		IP55				
			Motor power			
50 Hz	kW/hp	6/7.5	6/7.5	6/7.5	6/8.0	6/7.5
60 Hz	kW/hp	1.8/2.4	3/4.0	5.8/7.7	7.5/10.0	15/20.1
			Noise level			
50 Hz	dB(A)	64	65	67	69	75
60 Hz	dB(A)	66	67	69	71	77
Oil refill capacity	litre	4		5		15
Recommended oil		Ultragrade 20				

Service, Spares and Accessories

ES Spares

The ES series of pumps is designed for simple and easy maintenance that can be conducted by anyone with mechanical equipment maintenance skills. With this product design the ES series has 2 standard available kits to support a self-service approach.

The usual maintenance kits consist of the basic consumable items such as Oil, filters and ballast elements and these are recommended to be changed at approximately 3000 hour intervals. The preventative maintenance kits consist of the additional parts required to conduct a full specification service such as bearings, interior seals and rotary vane blades.

Service Tools

Product description	Order no.
Seal assembly tool ES65/100	A22201010
Mounting base for shaft seals ES65/100	A22201012
Bearing removal tool ES 65/100	A22201014
Mounting base for bearing removal ES65/100	A22201016
D10000 complete set of tools for preventive maintenance ES65/100	A22201018
Seal 1st assembly tool ES200/300	A22201020
Mounting base for shaft seal ES200/300	A22201022
Rotor holding tool ES200/300	A22201024
Seal 2nd assembly tool ES200/300	A22201026
Seal 2nd assembly additional tool ES200/300	A22201028
Complete set of tools for preventive maintenance ES200/300	A22201030
Bearing removal tool ES630	A22201032
Mounting base for bearing removal ES630	A22201034
Mounting base for seal and bearing ES630	A22201036
Shaft seal assembly tool ES630	A22201038
Coupling assembly tool ES630	A22201040
Bearing 1st assembly tool ES630	A22201042
Complete set of tools for preventive maintenance ES630	A22201044

Service Spares

Product description	Order no.
Suction valve spring ES65/ES100	A27102085
Exhaust valve ES65/ES100	A28706032
Bowex coupling ring ES65/ES100	A27103010
Exhaust valve ES200	A28706033
Suction valve spring ES200/ES300	A27102086
Suction valve spring ES630	A27102087
Exhaust valve ES300	A28706034
Exhaust valve ES630	A28706035
Additional exhaust valve ES630	A28706036
Bowex plastic ring ES630	A27103011
Bowex coupling ring ES200/ES300	A27103012

Maintenance Kits

Product description	Order no.
Minor service kit ES65/ES100	A35245990
Minor service kit ES200	A35255990
Minor service kit ES300	A35260990
Minor service kit ES630	A35265990
Major service kit ES65	A35245995
Major service kit ES100	A35250995
Major service kit ES200	A35255995
Major service kit ES300	A35260995
Major service kit ES630	A35265995

ES Accessories

There are a range of accessories available for ES pumps.

Product description	Order no.
ES65/ES100 Oil level sensor	A35266810
ES65/ES100 Oil level & 120 °C sensor	A35266811
ES65/ES100 Oil level sensor & PT100	A35266812
ES65/ES100 PT100 Temperature sensor	A35266813
ES200/ES300 Oil level sensor	A35277810
ES200/ES300 Oil level & 120 °C sensor	A35277811
ES200/ES300 Oil level sensor & PT100	A35277812
ES200/ES300 PT100 Temperature sensor	A35277813
ES630 Oil level sensor	A35288810
ES630 Oil level & 120 °C sensor	A35288811
ES630 Oil level sensor & PT100	A35288812
ES630 PT100 Temperature sensor	A35288813
ITO100 Inlet catchpot	A44102000
ITO300 Inlet catchpot	A44103000
ITO800 Inlet catchpot	A44104000
ITM100 Inlet dust filter	A44302000
ITM300 Inlet dust filter	A44303000
ITM800 Inlet dust filter	A44304000

Service

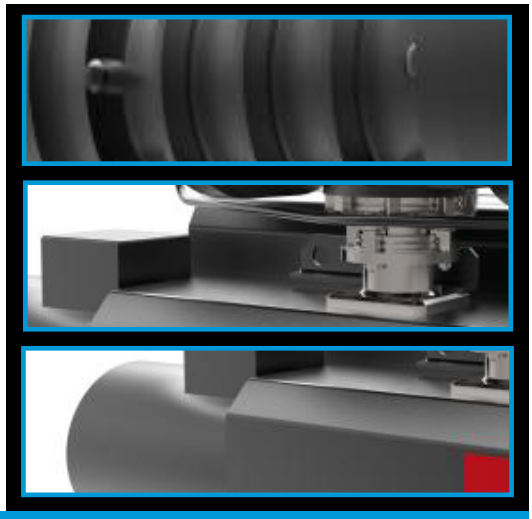
Edwards products, spares and accessories are available from Edwards companies in Belgium, Brazil, China, France, Germany, Israel, Italy, Japan, Korea, Singapore, United Kingdom, U.S.A. and a worldwide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive Edwards training courses. Order spare parts and accessories from your nearest Edwards company or distributor.

When you order, please state for each part required:

- Model and item number of your equipment.
- Serial number (if any).
- Item number and description of the part.

ES PUMP AND BOOSTER COMBINATIONS

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE



Edwards is able to offer a range of ES rotary vane pumps and mechanical boosters, complete with combination kits to mount the mechanical booster. The fitting of a mechanical booster to an ES rotary vane pump significantly increases the pumping speed and vacuum performance of your system, as well as increasing the ultimate vacuum attainable by approximately one decade of pressure. Edwards applications specialists are able to assist in the selection of the combination most suited to your requirements. Individual data sheets are available on request for all combinations showing the pumping speed of each combination together with an installation drawing to assist in the design of your system.

Features and Benefits

The performance of ES pump is enhanced by the integration with our range of EH boosters to increase both performance and ultimate vacuum thus adaptable to a wide range of applications.

The EH range of mechanical boosters (250-4200 m^3h^{-1}, 150-2500 cfm), with their unique hydrokinetic drive allowing continuous operation from atmosphere to ultimate vacuum, cuts pump down times by up to 50%.

They are available as fully assembled systemised unit ready to use. Alternatively connection kits can be supplied separately as a kit.

Applications

- Heat treatment.
- Drying.
- Coating.
- General industrial.

Pump Range

- ES100/EH250
- ES100/EH500
- ES200/EH500
- ES200/EH1200
- ES300/EH500
- ES300/EH1200
- ES300/EH2600
- ES300/EH4200
- ES630/EH1200
- ES630/EH2600
- ES630/EH4200

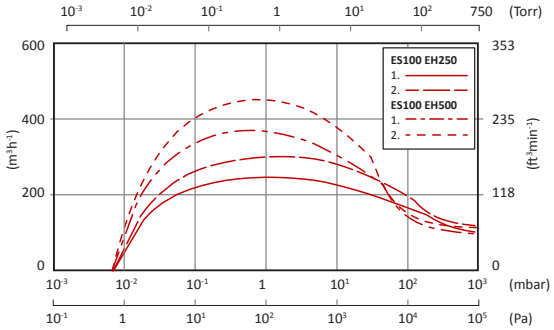
Performance Curves

ES100 combination

ES100

Pumping speed	
With gas ballast	
ES100/EH250	0.07 mbar
ES100/EH500	0.07 mbar
Without gas ballast	
ES100/EH250	0.008 mbar
ES100/EH500	0.008 mbar

ES100 Performance Curve (without gas ballast)

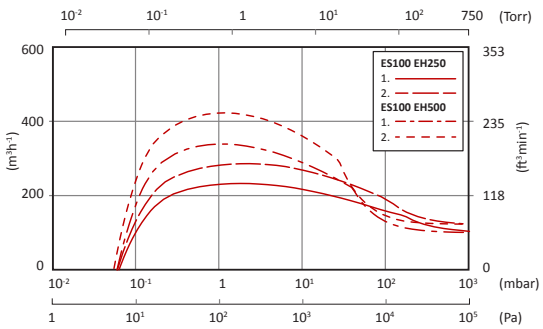


Ordering information

Product description
Please see ordering matrix at the end of this section

1	50 Hz
2	60 Hz

ES100 Performance Curve (with gas ballast)

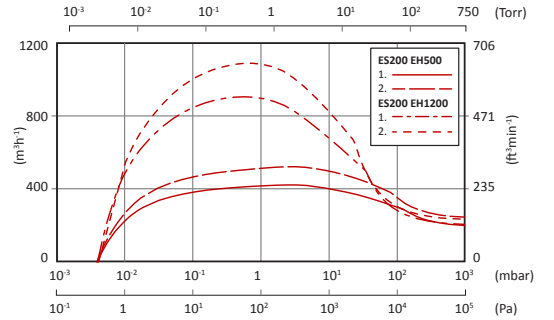


ES200 Combination

ES200

Pumping speed	
With gas ballast	
ES200/EH500	0.04 mbar
ES200/EH1200	0.04 mbar
Without gas ballast	
ES200/EH500	0.006 mbar
ES200/EH1200	0.006 mbar

ES200 Performance Curve (without gas ballast)

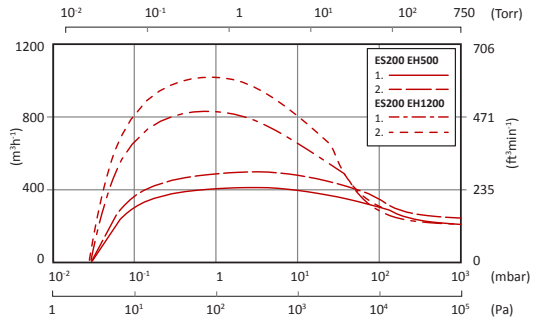


Ordering information

Product description
Please see ordering matrix at the end of this section

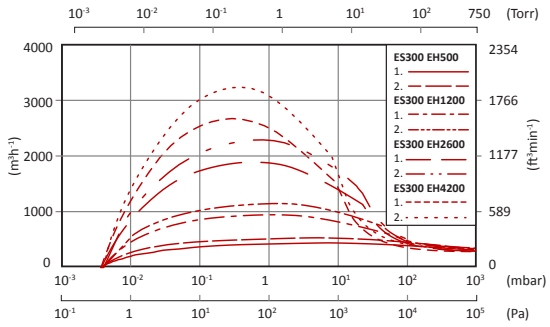
1	50 Hz
2	60 Hz

ES200 Performance Curve (withGas ballast)



ES300 Combination

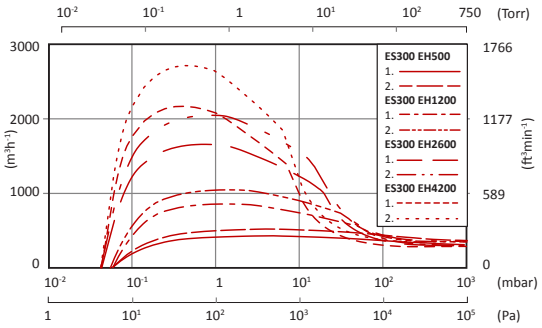
ES300 Performance Curve (without gas ballast)



ES300

Pumping speed	
With gas ballast	
ES300/EH500	0.06 mbar
ES300/EH1200	0.06 mbar
ES300/EH2600	0.06 mbar
ES300/EH4200	0.06 mbar
Without gas ballast	
ES300/EH500	0.005 mbar
ES300/EH1200	0.005 mbar
ES300/EH2600	0.005 mbar
ES300/EH4200	0.005 mbar

ES300 Performance Curve (with gas ballast)



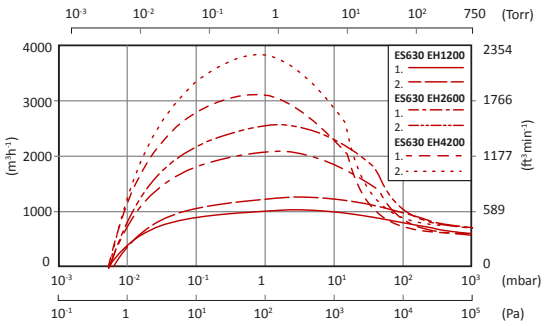
Ordering information

Product description
Please see ordering matrix at the end of this section

1	50 Hz
2	60 Hz

ES630 Combination

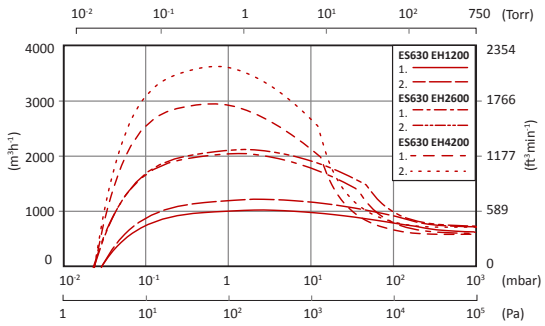
ES630 Performance Curve (without gas ballast)



ES630

Pumping speed	
With gas ballast	
ES630/EH1200	0.04 mbar
ES630/EH2600	0.04 mbar
ES630/EH4200	0.04 mbar
Without gas ballast	
ES630/EH1200	0.006 mbar
ES630/EH2600	0.006 mbar
ES630/EH4200	0.006 mbar

ES630 Performance Curve (with gas ballast)



Ordering information

Product description
Please see ordering matrix at the end of this section

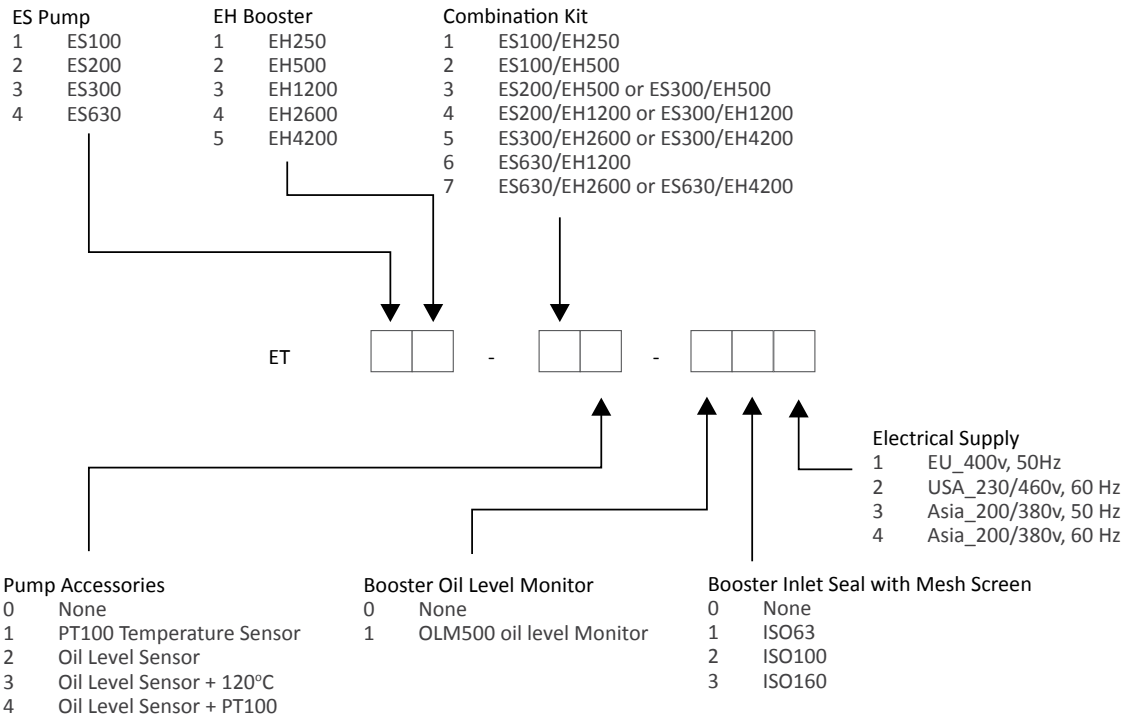
1	50 Hz
2	60 Hz

Technical Data

Pump Type	Without gas ballast	With gas ballast
ES100/EH250	0.008 mbar	0.07 mbar
ES100/EH500	0.008 mbar	0.07 mbar
ES200/EH500	0.006 mbar	0.04 mbar
ES200/EH1200	0.006 mbar	0.04 mbar
ES300/EH500	0.005 mbar	0.06 mbar
ES300/EH1200	0.005 mbar	0.06 mbar
ES300/EH2600	0.005 mbar	0.06 mbar
ES300/EH4200	0.005 mbar	0.06 mbar
ES630/EH1200	0.006 mbar	0.04 mbar
ES630/EH2600	0.006 mbar	0.04 mbar
ES630/EH4200	0.006 mbar	0.04 mbar
	A-weighted sound pressure level*	
ES100/EH250	71 dB(A)	
ES100/EH500	71 dB(A)	
ES200/EH500	72 dB(A)	
ES200/EH1200	72 dB(A)	
ES300/EH500	73 dB(A)	
ES300/EH1200	73 dB(A)	
ES300/EH2600	76 dB(A)	
ES300/EH4200	76 dB(A)	
ES630/EH1200	76 dB(A)	
ES630/EH2600	78 dB(A)	
ES630/EH4200	78 dB(A)	

*Noise level with 50 Hz supply at ultimate pressure, running at 60 Hz or at a higher inlet pressure will increase noise level

Ordering information



EM Oil Sealed Rotary Vane Pumps

Edwards rugged two stage mechanical oil sealed pumps are available in sizes from 40-275 m^3h^{-1}/30-206 ft^3min^{-1} They feature:

- Advanced oil lubrication circuit
- High reliability
- Accessories to match your application needs

Application and Accessory Information EM Rotary Pumps

The use of Edwards rotary pumps with our comprehensive range of accessories will result in enhanced performance and reliability. The information below will help you to select the correct accessories for your application. However, we recommend that you treat this as a guide only, because the final selection of components can be influenced by the operation of your vacuum system and the process by-products. If in doubt, please contact Edwards or your local supplier for further advice from an Edwards application specialist. When you select accessories for your system, the major aim is to prolong the life and the safe operation of the pumps and to ensure that the system continues to perform at its ultimate specification. To do this, you need to ensure that the system is able to accommodate the process media and any process by-products, including vapours, liquids or particulates, which may damage the pumps. At the same time, you should ensure that any materials discharged from the system to atmosphere are not harmful to the environment and to people nearby.

Broad Application Coverage

Industrial

Industrial EM primary pumps are annotated with the suffix “IND”. EM primary pumps are safe to handle non-flammable gases and vapours within the normal operating parameters of the pump. Flammable gases and vapours may also be pumped, provided they are outside the flammable range, please consult Edwards for advice.

PFPE

EM primary pumps may be supplied for use with PFPE oil. This enables them to be used in harsh corrosive processes, or where the presence of Oxygen will result in rapid degradation of hydrocarbon oils. Fomblin® must be purchased separately for PFPE prepared pumps.

ATEX

EM primary pumps (hydrocarbon oil only) may be supplied with ATEX classification either as part of a pump system or stand-alone. Please consult Edwards. ATEX compliance is typically specified for use in Europe, but may also be required in other areas.

ATEX compliant EM primary pumps are suitable for operation in ATEX systems rated as follows:

Pump classification	Internal classification	External classification
E2M40 & E2M80	Ex II 3 Gc IIB T4	Ex II 2 G IIB T4
E2M175 & E2M275	Ex II 3 Gc IIB T3	Ex II 2 G IIB T160

Where the following classification:

Symbol	Meaning
Ex	Specifies that an ATEX-compliant EM pump can be used in a potentially explosive atmosphere
II	Equipment Group – II = non-mining equipment
3 (Int) 2 (Ext) G	Equipment Category 3 (or 2) – G = Gas
c	Constructional safety
IIB	Gas group – suitable to pump gases in gas group IIB Where no gas group is mentioned, there are no limitations
T4 T160 T3	Temperature Class – Gas auto-ignition temperature greater than: – T4 =135 ˚C, T160 = 160 ˚C, T3 = 200 ˚C

A four-pole, three-phase ATEX approved flameproof motor provides direct drive through an ATEX certified flexible coupling to the E2M40, E2M80, E2M175 and E2M275 pumps. A cooling fan is attached to the drive coupling on the E2M40 and E2M80 pumps. The E2M175 and E2M275 pumps are water-cooled.

Lubrication is provided by a sliding vane oil pump, which delivers pressurised oil to the vacuum pumping mechanism. Pumps are supplied with sealed gas ballast. Plugs have been fitted to prevent flammable atmospheres accidentally entering the pump. If the gas ballast facility is required, an N_2 purge must be used, or clean air supplied from a safe area.

For much of the operating cycle the pump operates at pressures significantly below 0.8 bar (116 psi) absolute. However, the final stage of the pump will exhaust to atmosphere and there is a startup and shutdown period where the whole pump is briefly operating at atmospheric pressure. A surface temperature thermal snap switch is fitted to the body of the E2M175 and E2M275 rotary pumps. This must be connected to an intrinsically safe circuit suitable for the hazardous zone in which it may be located; otherwise it must be located in a safe area. If the pump temperature should rise due to a fault condition, the snap switch activates and the pump will shut-off.

Trapping Particulates

In any application, first ensure that particulates in the process stream are trapped before they get into the pump: use the ITM or ITF inlet filters which are suitable for use with oil-sealed and dry pumps. However, in processes which generate or contain large amounts of particulates, some will enter the pump: use our EOF, an external oil filter, to remove particulates from the pump oil during operation.

ITF inlet dust filters

If the mechanical pump is a backing pump for a diffusion pump, the diffusion pump will trap particulates during normal operation, but the diffusion pump will not trap dust during the roughing stage of the process cycle. We recommend you fit an ITF filter to the mechanical pump inlet (that is, in the foreline): this filter has a replaceable element. Note that the impedance of a clean filter will cause the pumping speed to decrease by about 10% at 1 mbar and 20% at 10^{-2} mbar. The ITF filter is more that 96% efficient, when tested in accordance with BS2831

ITM High Capacity Inlet

Dust Filters use an ITM filter for applications where there is a high load of dust and particulates. Fit the ITM directly to the inlet of a rotary or mechanical booster pump. This filter has a stainless steel mesh element that can be washed and reused. It is ideal for use when backing diffusion pumps or for wet processes where a paper filter may become blocked quickly. The ITM filter has high conductance and is therefore ideal for applications which require fast pump down times. The ITM filter has an efficiency of 90%, when tested in accordance with BS3831

EOF External Oil Filters

Use the EOFs with the EM oil-sealed rotary pumps to remove particulates trapped in the pump oil. The EOFA and EOFM filters use the internal pressurized oil system of the pump to continually filter a proportion of the pump oil. These filters are only suitable for hydrocarbon oil. The EOFM filter removes particulates down to 0.5 microns, and the EOFA filter both removes particulates and includes an active element to remove acidic and other aggressive contaminants from the oil.

Pumping Vapours

The use of gas ballast significantly improves vapour handling capability of oil sealed rotary pumps. We offer a number of accessories to improve the utility of gas ballast.

EBV Gas Ballast Control Valve

Fit EBV gas ballast control valve to allow remote or automated control of gas ballast.

TCV Temperature Control Valve

The vapour pumping performance of the larger oil sealed pumps can be enhanced by fitting a TCV. Use the TCV both to warm-up the pump faster (which reduces the amount of condensation in the pump) and to reduce water usage and cost.

ITC Inlet Chemical Traps

Fit an ITC trap to the inlet of the pump to protect against the aggressive process vapours that may corrode the pump or degrade the oil.

Trapping Liquids

The use of gas ballast allows an oil sealed pump to process significant quantities of vapour. However, oil sealed pumps cannot pump liquid streams and it is important both to remove liquids before they reach the pump inlet and to prevent condensed liquids from flowing back into the pump outlet. The following accessories may be suitable for your application:

ITO Inlet Trap

The ITO inlet trap is ideal for processes where there is a risk of liquids in the process entering the pump inlet. Fit the ITO trap to the pump inlet or elsewhere in the foreline.

CP Catchpot

Process vapours passing through the pump may condense after the pump outlet, in the exhaust line. Fit a CP catchpot to the pump outlet to trap the condensates and prevent them flowing back into the pump.

Exhaust Management

You should aim to minimise the impact of gases and vapours which exhaust from the pump outlet. Edwards offers a range of exhaust management systems for the most exacting applications. However, for most straight-forward applications of oil sealed rotary pumps, we recommend that you fit an oil mist filter to the pump outlet to remove oil mist vapour. A mist filter is not required if you vent the exhaust gases remotely or pass them through exhaust scrubbing equipment.

MF Oil Mist Filters

The MF filters remove oil mist (vapour) from the process gases exhausted from the outlet of an oil sealed pump. The filters remove both odour and oil vapour and so prevent it from reaching the atmosphere and the workplace.

Back Migration

When operated at ultimate pressure for extended periods of time, any oil sealed pump allows oil vapour to back migrate into the process chamber. The back-migration of oil vapour could contaminate your process or your vacuum system.

ITC Inlet Chemical Trap

Fit an ITC inlet chemical trap (filled with an alumina charge) to the pump inlet to trap oil vapour and to prevent back migration.

Applications

- Refrigeration dehydration
- Brake line evacuation
- TV aluminisers
- Vacuum metallurgy
- Fluorescent light tube pumping
- Thin film coating
- IT hard disc coating
- Vacuum distillation
- Cryogenic vessel evacuation
- Transformer and cable drying
- Pharmaceutical freeze drying
- Space simulation
- Crystal growing
- Automotive
- Chemical processing

E2M40 AND 80 OIL SEALED ROTARY VANE PUMPS

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE

Edwards E2M series two stage oil sealed rotary vane vacuum pumps are renowned for their high ultimate vacuum, rapid pumping speeds, quiet operation and ability to handle water vapour. These direct drive rotary vane pumps are inherently compact and vibration free, and with their finger-proof fan and coupling housings they offer excellent operator protection.

A comprehensive range of accessories is available to allow use on a wide variety of vacuum applications.

Features and Benefits

Reliability
- Reliable and stable process – effective lubrication even under high gas loads.

Robust
- No contamination of process – oil and air suck-back protection.

Performance
- Long and trouble free life – industrial roller bearings on drive shaft.

Reassurance
- Peace of mind – tried, tested and industry standard for years.
- Reliable and stable – high vacuum performance.

Applications

- Vacuum metallurgy processes.
- Thin film coating technologies.
- Pharmaceutical freeze drying.
- Refrigeration and air conditioning system evacuation, drying, and backfilling.

Pump Range

E2M40
- E2M40
- E2M40FX
- E2M40T4

E2M80
- E2M80
- E2M80FX
- E2M80T4

E2M175
- E2M175
- E2M175FX
- E2M175T3

E2M275
- E2M275
- E2M275FX
- E2M275T3

Performance Curves

E2M40 Oil Sealed Rotary Pump

E2M40

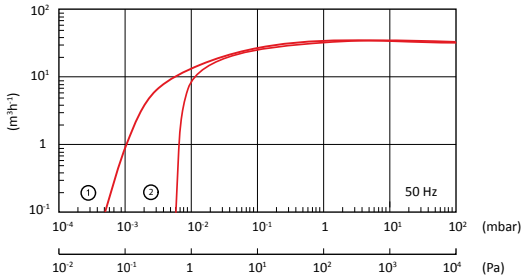
Displacement	
50 Hz	42.5 $m^3hr/25\ ft^3min^{-1}$
60 Hz	50.5 $m^3h^{-1}/29.7\ ft^3min^{-1}$
Speed (Pneurop)	
50 Hz	37 $m^3h^{-1}/21.8\ ft^3min^{-1}$
60 Hz	44 $m^3h^{-1}/25.9\ ft^3min^{-1}$

Ordering information

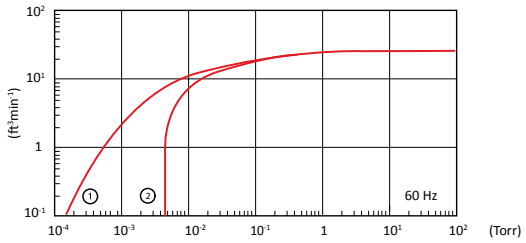
Product description	Order no.
E2M40 HC IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36404934
E2M40 HC IE3 EU/US 50/60HZ 380-400V 50HZ, 230 / 460V 60HZ	A36404940
E2M40 FX IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36417934
E2M40 FX IE3 EU/US 50/60HZ 380-400V 50HZ, 230 / 460V 60HZ	A36417940
E2M40 AZ IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36407934
E2M40 AZ IE3 EU/US 50/60HZ 380-400V 50HZ, 230 / 460V 60HZ	A36407940

Each EM pump is supplied Ultragrade 70 oil. For PFPE prepared FX pumps Fomblin® to be ordered separately.

E2M40 Performance Curve

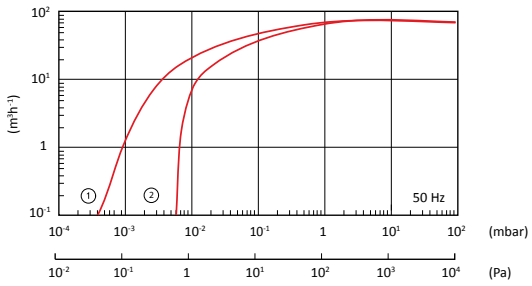


1	Without gas ballast
2	With gas ballast

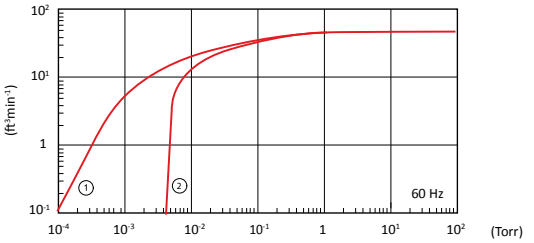


1	Without gas ballast
2	With gas ballast

E2M80 Performance Curve



1	Without gas ballast
2	With gas ballast



1	Without gas ballast
2	With gas ballast

E2M80

Displacement	
50 Hz	80 m^3h^{-1}/47.1 ft^3min^{-1}
60 Hz	96 m^3h^{-1}/56.5 ft^3min^{-1}
Speed (Pneurop)	
50 Hz	74 m^3h^{-1}/43.6 ft^3min^{-1}
60 Hz	90 m^3h^{-1}/53 ft^3min^{-1}

Ordering information

Product description	Order no.
E2M80 HC IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36504934
E2M80 HC IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36504940
E2M80 FX IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36517934
E2M80 FX IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36517940
E2M80 AZ IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36507934
E2M80 AZ IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36507940

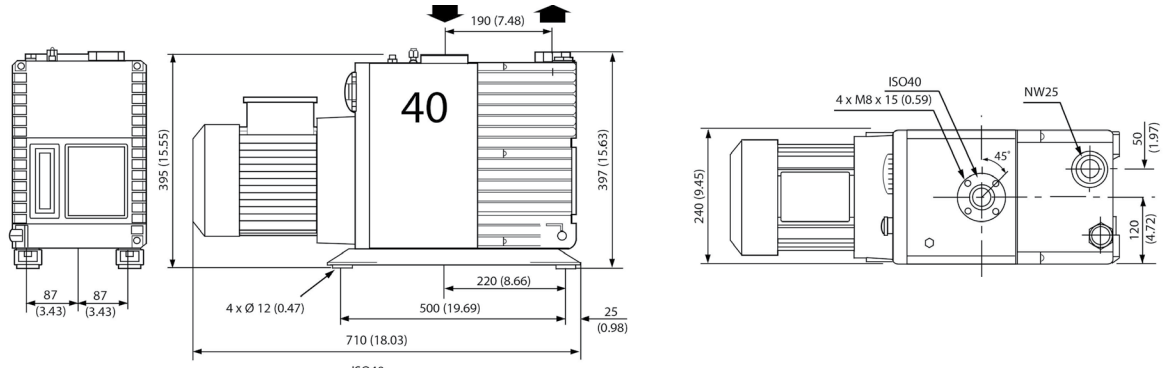
Each EM pump is supplied Ultragrade 70 oil.
For PFPE prepared FX pumps Fomblin® to be ordered separately.

Technical Data

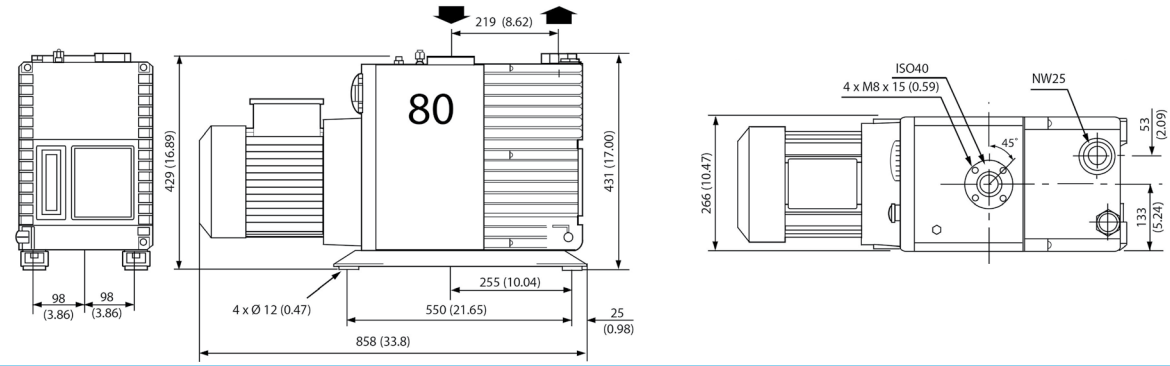
	Units	E2M40	E2M80
		Displacement	
50 Hz	m^3h^{-1}/ft^3min^{-1}	42.5/25	80/47.1
60 Hz	m^3h^{-1}/ft^3min^{-1}	50.5/29.7	96/56.5
		Speed (Pneurop)	
50 Hz	m^3h^{-1}/ft^3min^{-1}	37/218	74/43.6
60 Hz	m^3h^{-1}/ft^3min^{-1}	44/25.9	90/53
Number of stages		2	
		Ultimate vacuum (total pressure)	
without gas ballast	mbar/Torr	$1 \times 10^{-3}/7.7 \times 10^{-4}$	
with gas ballast	mbar/Torr	$7 \times 10^{-3}/5.4 \times 10^{-3}$	
		Ultimate with Fomblin®	
without gas ballast	mbar	1×10^{-2}	
Inlet connection		ISO40	
Outlet connection		25 mm flange suitable for NW25	
Max outlet pressure		0.5 bar gauge	
Max inlet pressure for water vapour	mbar/Torr	7/5.3	5/3.8
Max water vapour pumping rate	kg h^{-1}/lb h^{-1}	0.2/0.4	0.3/0.7
Weight	kg/lb	75/165	102/224
Motor protection rating		IP55	
		Motor power	
50 Hz	kW/hp	11/15	22/3
60 Hz	kW/hp	15/2	3/4
		Standard oil capacity	
maximum	litre	4.0	6.3
minimum	litre	22	4
		PFPE oil capacity	
maximum	litre	4.0	
minimum	litre	22	
Recommended oil		Ultragrade 70	
Noise level	dB(A)	65	70

Dimensions

E2M40 dimensions



E2M80 dimensions



Service and Spares

Maintenance Kits

Product description	Order no.
E2M40	
Clean and overhaul kit	A34401131
Blade Kit	A36401050
Major service kit	A36401814
Interior assembly	A36401100
E2M80	
Interior assembly	A36501100
Clean and overhaul kit	A34501131
Blade kit	A36501050
Major service kit	A36501814
All models	
Fine oil-filter	A22304041
Common seals kit	A34401820

E2M175 AND 275 OIL SEALED ROTARY VANE PUMPS
MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE

Edwards E2M175/275 series two stage oil sealed rotary vane vacuum pumps are renowned for their high ultimate vacuum, rapid pumping speeds, quiet operation and ability to handle water vapour. These direct drive rotary vane pumps are inherently compact and vibration free, and with their finger-proof fan and coupling housings they offer excellent operator protection.

This pump is suitable for most duties and is safe to handle non-flammable gases and vapours within the normal operating parameters of the pump.

Features and Benefits

- **Reliability**
  Reliable and stable process – effective lubrication even under high gas loads.
- **Robus**
  No contamination of process – oil and air suck-back protection.
- **Performance**
  Long and trouble free life – industrial roller bearings on drive shaft.
- **Reassurance**
  Peace of mind – tried, tested and industry standard for years.
  Reliable and stable – high vacuum performance.

Applications

- Vacuum metallurgy processes.
- Thin film coating technologies.
- Pharmaceutical freeze drying.
- Refrigeration and air conditioning system evacuation, drying, and backfilling.

Pump Range

E2M175
- E2M175
- E2M175FX
- E2M175T3

E2M275
- E2M275
- E2M275FX
- E2M275T3

Performance Curves

E2M175 Oil Sealed Rotary Pump

E2M175

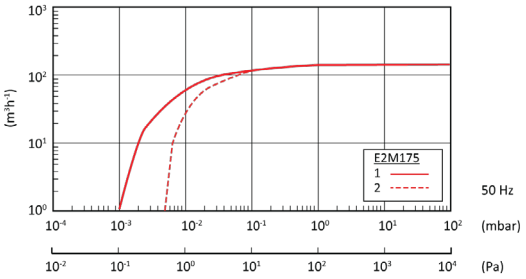
	Displacement
50 Hz	178 m^3h^{-1}/105 ft^3min^{-1}
60 Hz	214 m^3h^{-1}/126 ft^3min^{-1}
	Speed (Pneurop)
50 Hz	160 m^3h^{-1}/94 ft^3min^{-1}
60 Hz	196 m^3h^{-1}/115 ft^3min^{-1}

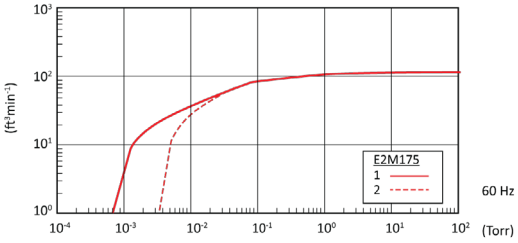
Ordering information

Product description	Order no.
E2M175 HC IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36604934
E2M175 HC IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36604940
E2M175 FX IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36617934
E2M175 FX IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36617940
E2M175 AZ IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36607934
E2M175 AZ IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36607940

Each EM pump is supplied Ultragrade 70 oil.
For PFPE prepared FX pumps Fomblin® to be ordered separately.

E2M175 Performance Curve





1	Without gas ballast
2	With gas ballast

E2M275 Oil Sealed Rotary Pump

E2M275

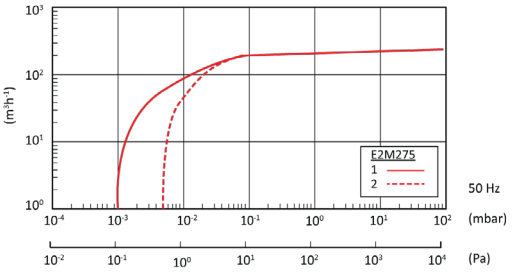
	Displacement
50 Hz	292 m^3h^{-1}/172 ft^3min^{-1}
60 Hz	350 m^3h^{-1}/206 ft^3min^{-1}
	Speed (Pneurop)
50 Hz	255 m^3h^{-1}/150 ft^3min^{-1}
60 Hz	306 m^3h^{-1}/180 ft^3min^{-1}

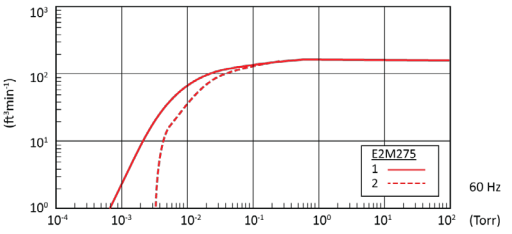
Ordering information

Product description	Order no.
E2M275 HC IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36704934
E2M275 HC IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36704940
E2M275 FX IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36717934
E2M275 FX IE3 EU/US5 0/60HZ 380-400V 50HZ, 230/460V 60HZ	A36717940
E2M275 AZ IE3 ASIA 50/60HZ 200V 50/60HZ, 380V 60HZ	A36707934
E2M275 AZ IE3 EU/US 50/60HZ 380-400V 50HZ, 230/460V 60HZ	A36707940

Each EM pump is supplied Ultragrade 70 oil.
For PFPE prepared FX pumps Fomblin® to be ordered separately.

E2M275 Performance Curve





1	Without gas ballast
2	With gas ballast

Technical Data

	Units	E2M175	E2M275
Displacement			
50 Hz	m^3h^{-1}/ft^3min^{-1}	178/105	292/172
60 Hz	m^3h^{-1}/ft^3min^{-1}	214/126	350/206
Speed (Pneurop)			
50 Hz	m^3h^{-1}/ft^3min^{-1}	160/94	255/150
60 Hz	m^3h^{-1}/ft^3min^{-1}	196/115	306/180
Number of stages		2	
Ultimate vacuum (total pressure)			
with gas ballast	mbar/Torr	$1 \times 10^{-3}/7.7 \times 10^{-4}$	
without gas ballast	mbar/Torr	$7 \times 10^{-3}/5.4 \times 10^{-3}$	$5.0 \times 10^{-3}/3.8 \times 10^{-3}$
Ultimate with Fomblin®			
without gas ballast	mbar	1×10^{-2}	-
Inlet connection		ISO63 blank flange with seal	
Outlet connection		ISO40 flange centre tapped	
Max outlet pressure		0.5 bar gauge	
Max inlet pressure for water vapour	mbar/Torr	20/15	12/9
Max water vapour pumping rate	$kg\ h^{-1}/lb\ h^{-1}$	0.3/0.7	23/5.1
Weight	kg/lb	204/449	222/488
Motor protection rating		IP44	
Motor power			
50 Hz	kW/hp	5.5/7.5	7.5/10
60 Hz	kW/hp	6.5/8.5	8.5/11
Standard oil capacity			
maximum	litre/qt	25/26	28/29.5
minimum	litre/qt	16/17	19/20
PFPE oil capacity			
maximum	litre/qt	18/19	-
minimum	litre/qt	6.5/6.9	TBA
Recommended oil		Ultragrade 70	
Noise level	dB(A)	75	
Water cooling requirement	$lmin^{-1}$	13	2

Service

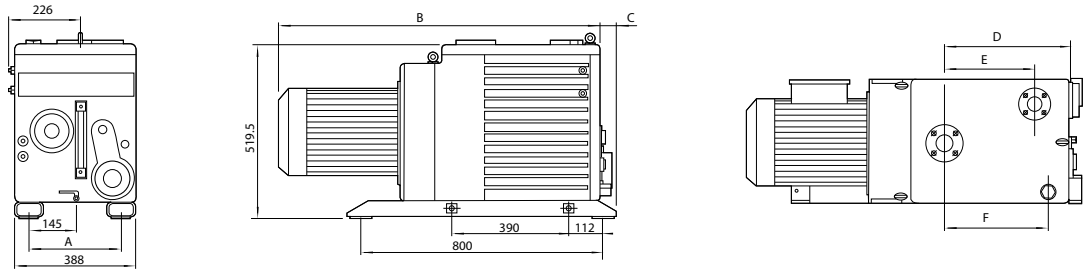
Edwards products, spares and accessories are available from Edwards companies in Belgium, Brazil, China, France, Germany, Israel, Italy, Japan, Korea, Singapore, United Kingdom, U.S.A. and a worldwide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive Edwards training courses. Order spare parts and accessories from your nearest Edwards company or distributor.

When you order, please state for each part required:

- Model and item number of your equipment.
- Serial number (if any).
- Item number and description of the part.

Dimensions

E2M175/275 dimensions



	A	B	C	D	E	F
E2M175	290 (1142)	1011 (39.80)	55 (217)	329 (1295)	196 (7.72)	237 (9.33)
E2M275	290 (1142)	1152 (45.35)	55 (217)	425 (16.73)	294 (1158)	333 (13.11)

Service and Spares

Maintenance Kits

Product description	Order no.
E2M175	
Maintenance kit	A36601831
Seals kit	A36601840
Complete interior assembly	A36601100
E2M275	
Maintenance kit	A36701831
Seals kit	A36601840
Complete interior assembly	A36701100

Service

Edwards products, spares and accessories are available from Edwards companies in Belgium, Brazil, China, France, Germany, Israel, Italy, Japan, Korea, Singapore, United Kingdom, U.S.A. and a worldwide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive Edwards training courses. Order spare parts and accessories from your nearest Edwards company or distributor.
When you order, please state for each part required:

- Model and item number of your equipment.
- Serial number (if any).
- Item number and description of the part.

Large Pump Accessories

MF Outlet Mist Filters

The MF100 and MF300 mist filters are suitable for pumps from E2M40 to E2M275. They are very efficient at 99.85% DOP test (pre-wetted filter; 99.5% with dry element). The oil level sight-glass provides easy monitoring of mist filter status.

The MF100AE is a version of the MF100, designed for use with corrosive gases and vapours and for greater security when processing toxic substances. It is very efficient at 99.1% DOP test (pre-wetted; 98.4% with dry element). This version is leak tested to 1×10^{-4} mbar l s^{-1} / 3.8 x 10^{-3} Torr. The filter element, sight-glasses and seals are resistant to chemical attack. The MF100AE is fitted with an acrylic sight-glass (for use with fluorinated processes); a glass sight-glass is also supplied with the filter (for use with chlorinated processes).

A version of the EMF clean application oil return kit is available for all the MF filters, except the MF100AE.

Ordering Information

Product description	Order no.
Model MF100 mist filter (12 kg/26.5 lb)*	A46203000
Model MF100AE mist filter (12 kg/26.5 lb)*	A46211000
Model MF300 mist filter (28 kg/62 lb) †	A46204000

*Supplied with two NW25 “C” clamps, NW25 elbow, two NW25 centring-ring and O-rings, bolts, washers, mounting brackets and studs.
† 2 Supplied with two ISO40 “C” clamps, ISO40 elbow, two 40 mm Co-Seals, bolts, washers, mounting brackets and studs.

Accessories	Order no.
Clean application oil return kit (E2M40 to E2M80)	A50004000
Clean application oil return kit (E2M175 to E2M275)	A50005000

Spares	Order no.
MF100	A22304020
MF100AE	A22304052
MF300	A22304021
Spares kits	
MF100, MF100AE	A46203800
MF300	A46204800
MF100AE sight-glass kit	A50080000

CP Outlet Catchpots

In some industrial applications it is desirable for pumps to be provided with piped exhaust arrangements to carry gases and vapours to the outside of the building. There is always a risk that some vapour carried out with the effluent gas will cool and condense as it travels up the exhaust line and the liquid produced will drain back into the pump causing serious contamination. For this reason, it is good practice to use a catchpot between the pump outlet and the exhaust line to prevent this from happening.

These catchpots are designed for fitting directly to the pump outlet, or can be remotely mounted if required. A “high level” sight glass is provided to indicate the need for draining the catchpot when the nominal capacity is reached. A drain plug is also provided.

Note: When an oil mist filter is used, a separate catchpot is generally unnecessary.

Ordering Information

Product description	Order no.
Model CP100 outlet catchpot,	A46103000
6.5 litre/6.2 qt capacity (12.0 kg/26.5 lb)* Model CP300 outlet catchpot,	A46104000
23.0 litre/22 qt capacity (28.0 kg/62 lb) †	

*Supplied with two NW25 “C” clamps, NW25 elbow, two NW25 centring-rings and O-rings, bolts, washers, mounting bracket and studs.
† Supplied with two ISO40 “C” clamps, ISO40 elbow, two 40 mm O-rings and centringrings, bolts, washers, mounting brackets and studs.

External Oil Filters: EOF100A/300A (Chemical) and EOF100M/300M (Dust)

These filters are operated by the internal pressurized oil system of the pump, which by-passes a proportion of the oil through the filter. The filters are easy to install – just connect the flexible hoses supplied to the oil outlet and return connectors on the pump. The oil capacities are approximately 6 litres / 5.7 qt (EOF100) and 15 litres / 14.3 qt (EOF300).

The EOF100A and EOF300A chemical filters have a renewable highcapacity, activated earth element. The filters purify the oil by removing acidic and other aggressive contaminants. These filters are intended for use with hydrocarbon oils, and they will greatly increase the interval between oil changes.

The EOF100M and EOF300M dust filters have pleated paper elements which trap small dust particles (down to 0.5 micron diameter). Use these filters for applications which produce large quantities of abrasive dust (for example, vacuum furnaces).

Ordering Information

Product Description	Order no.
External oil filter, without connection kit	
EOF100A	A50024000
EOF100M	A50025000
External oil filter, with E2M175 and 275 connection kit	
EOF300A	A50003000
EOF300M	A50023000
Connection kit for E2M40 and 80	
EOF100A and M	A50039000
EOF300A and M	A36401020

Product Description	Order no.
Activated earth element	
EOF100A	A22304043
EOF300A	A22304033
Dust filter element	
EOF100M	A22304044
EOF300M	A22304042

Vibration Isolators

You may need to fit vibration isolators to your pump if you mount it into a frame or 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.

Ordering Information

Pump	Approximate Reduction in Height with Pump Fitted (mm)	Weight Set of Four	Order No
E2M40	.5	0.6 kg/1.3 lb	A24801405
E2M80	2.5	0.6 kg/1.3 lb	A24801405
E2M175	3	0.9 kg/2 lb	A24801406
E2M275	3.5	0.9 kg/2 lb	A24801406

Details of vibration isolators for use with rotary/mechanical booster pump combinations are available on request.

OLM100 Oil Level Monitor

Fit the OLM100 in place of the oil sight glass on the E2M 40 and 80 pumps. The OLM100 continues to allow visual inspection of the oil level and condition, while also providing a switched output for remote indication. Technical data: 24 V a.c. or d.c., maximum current 0.5 A, switching power 10 W (12 VA).

Ordering Information

Product description	Order no.
OLM100 oil level monitor	A50433000

EBV Gas Ballast Control Valves

Fit the EBV300D for E2M40, 80, 175 and 275) to allow remote operation of the pump's gas ballast control. For example, the EBV can be configured to switch off the gas ballast when the pump is switched off, to provide suckback protection. The EBV can also be configured to prevent the 175 and 275 from running backwards when the gas ballast valve is open and the pumps are stopped under vacuum.

Ordering Information

Product description	Order no.
EBV300D (1.0 kg) 220 – 240 V s.ph 50/60 Hz	A50017930

TCV300 Temperature Control Valve

Use the TCV300 with the E2M175 and 275 pumps. The valve facilitates rapid pump warm-up and higher operation temperatures. This improves the pump's vapour pumping performance. The TCV300 also reduces the use of cooling water and reduces operation costs.

Ordering Information

Product description	Order no.
TCV300 (1.2 kg/2.6 lb)	A50001000

ITF Inlet Dust Filters

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 20 m^3h^{-1} / 12 ft^3min^{-1} pump by about 20% at 1 mbar / 0.75 Torr and 25% at 10 mbar / 7.5 Torr.

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).

Ordering Information

Product description	Order no.
ITF100 inlet dust filter (7.0 kg/15 lb)*	A44202000
ITF300 inlet dust filter (8.3 kg/18 lb)†	A44203000
ITF800 inlet dust filter (20.2 kg/44 lb) **	A44204000
ITF3000 inlet dust filter† †	A44212000

*Supplied with bolts, washers, 40 mm O-ring and centring-ring
† Supplied with 63 mm Co-Seal, bolts and washers
** Supplied with 100 mm Co-Seal, bolts and washers
†† Supplied with 160 mm Co-Seal, bolts and washers

Spares	Order no.
ITF100 element and gasket kit	A44202800
ITF300 element and gasket kit	A44203800
ITF800 element and gasket kit	A44204800
ITF3000 element (2 required)	A22304037

ITM High Capacity Inlet Dust Filters

The ITM deep, stainless steel mesh elements are ideal for applications where fast pump-down times are required and which produce high levels of dust and grit (which would normally clog the ITF filters very quickly). You can wet the stainless steel mesh element with oil to improve dust adhesion. You can wash the mesh elements and re-use them indefinitely.

The benefits of the ITM filters include:

- Thick aluminium casting, to withstand abrasion.
- Tangential entry port, to promote centrifugal separation of dust particles.
- Filter efficiency better than 90% (tested to BS2831, dust number 2).
- Glass cover, to allow a visual check of the filter element.

Ordering Information

Product description	Order no.
ITM100 high capacity dust filter (7.2 kg/16 lb)*	A44302000
ITM300 high capacity dust filter (8.7 kg/19 lb)†	A44303000
ITM800 inlet dust filter (20.2 kg/44 lb)**	A44304000
ITM3000 inlet dust filter††	A44312000
ITM5000 inlet dust filter	A44313000

*Supplied with bolts, washers, 40 mm O-ring and centring-ring
† Supplied with 63 mm Co-Seal, bolts and washers
** Supplied with 100 mm Co-Seal, bolts and washers
†† Supplied with 160 mm Co-Seal, bolts and washers

Spares	Order no.
ITM100 filter element	A22305020
ITM300 filter element	A22305019
ITM800 filter element	A22305018
ITM3000 filter element (2 required)	A22305033

ITO Inlet Catchpots

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

- Capture condensable vapours.
- Helps prevent 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.
ITO100 inlet catchpot, 5.47 litres/5.2 qt capacity (6.8 kg, 15 lb)*	A44102000
ITO300 inlet catchpot, 7.87 litres/7.5 qt capacity (8.0 kg/18 lb)†	A44103000
IT0800 inlet catchpot, 9.5 litres/10 qt capacity (19.5 kg/43 lb) **	A44104000

*Supplied with bolts, washers, 40 mm O-ring and centring-ring
† Supplied with 63 mm Co-Seal, bolts and washers
** Supplied with 100 mm Co-Seal, bolts and washers

ITC 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.

Ordering Information

Product description	Order no.
ITC100 inlet chemical trap* Charcoal charge 0.75 kg/1.7 lb, weight 16.5 kg/ 1.7 lb	A44402000
ITC300 inlet chemical trap† Charcoal charge 1.1 kg/2.4 lb, weight 9 kg/20 lb	A44403000
ITC800 inlet chemical trap** Charcoal charge 3.3 kg/2.4 lb, weight 21 kg/20 lb	A44404000

* Supplied with bolts, washers, 40 mm O-ring and centring-ring
† Supplied with 63 mm Co-Seal, bolts and washers
** Supplied with 100 mm Co-Seal, bolts and washers

Spares	Order no.
0.5 kg/1.1 lb activated charcoal	H12205001
3 kg/6.6 lb activated charcoal	H12205002
0.45 kg/1 lb activated alumina	H02600050
0.2 kg/0.5 lb activated alumina	H02600056

EM PUMP AND EH BOOSTER COMBINATIONS

Rotary Pump
(Includes pump, frame and coupling components)

2 E2M40 - with Ultragrade Oil
5 E2M80 - with Ultragrade Oil
8 E2M175 - with Ultragrade Oil
B E2M275 - with Ultragrade Oil
D E2M40FX - PFPE prepared no oil
E E2M80FX - PFPE prepared no oil
F E2M175FX - PFPE prepared no oil

Booster Pump
(Includes booster and coupling components)

1 EH250 - with Ultragrade Oil
3 EH500 - with Ultragrade Oil
5 EH1200 - with Ultragrade Oil
7 EH2600 - with Ultragrade Oil
B EH250FX - PFPE prepared no oil
C EH500FX - PFPE prepared no oil
D EH1200FX - PFPE prepared no oil
E EH2600FX - PFPE prepared no oil

Mist Filter

0 No Mist Filtr
1 MF100
2 MF100AE
3 MF300
4 MF100 with clean Oil Return Kit
5 MF100AE with clean Oil Return Kit
6 MF300 with clean Oil Return Kit

Voltage

1 EU_400v, 50Hz
2 USA_460v, 60 Hz
3 Japan/Korea_200/380v, 60Hz
4 Japan/China_200/380v, 50Hz
5 USA_230v, 60 Hz

Oil Level Monitor

0 No oil level monitor
1 Oil level monitor – rotary pump only
2 Oil level monitor – booster pump only
3 Oil level monitors – both pumps

On-line Starter

0 No on-line starter
1 Starter Box E2M40 / E2M80
2 Starter Box E2M175 / E2M275

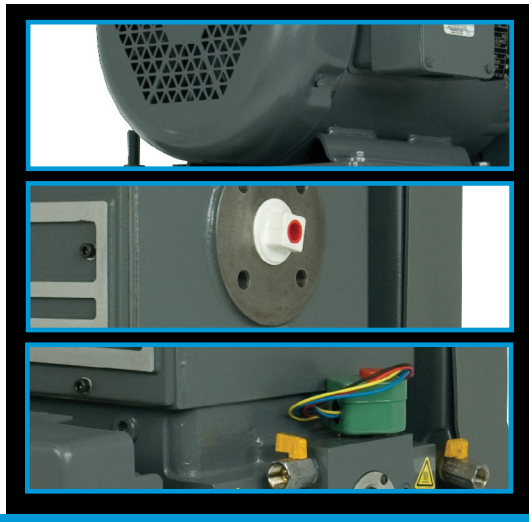
Oil Filtration (Includes connection kit)

0 No oil filtration
1 EOF100A
2 EOF100M
3 EOF300A
4 EOF300M

Note: Please copy the link: http://edwebid3.edwardshighvacuum.net/Edconfigurator/index.aspx and order your pump and booster combination.
In North America, frame-mounted systems are also available. Please contact Edwards for further details.

STOKES MICROVAC SERIES OIL SEALED ROTARY PISTON PUMPS

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE



The Stokes Microvac rotary piston pump has set the standard for performance, efficiency, reliability and repairability in the industry for over 80 years. The Stokes Microvac J series rotary piston pump has been improved, upgraded, and fine-tuned to deliver even better dependability and productivity combined with minimal maintenance and process downtime. The integral oil distribution system eliminates external piping and delivers leak-free operation in a stylised design. A stiffer motor mounting platform cuts flexibility to minimise motor belt wear. A stylised oil reservoir cover and side cover 'O' rings improve sealing to eliminate oil leakage. An integral gas ballast valve built into the side cover allows quick adaptation to automatic gas ballast. A wide range of versatile accessories are available along with the ability to integrate with a range of mechanical boosters making the Stokes Microvac easily adaptable to suit your application and pumping requirements.

Features and Benefits

- **Reliable**
  Over 80 years of time tested proven performance with experienced service and technical support.
  Dependability – low rotational speed enables longest pump life cycle.
- **Robust**
  Easy on-site maintenance – robust simple mechanism for high reliability and ease of rebuild.
- **Flexible**
  Configured for you – choice of pumping combinations available with a variety of boosters.
- **Reassurance**
  Up to date technology – continued investment in design and technology improvements.
  No unplanned downtime – worry free pumping backed by full warranty and after sales support.

Application

- Automotive.
- General applications.
- Metallurgy.
- Vacuum coating.
- Vacuum melting.
- Chemical processing.
- Heat treatment.
- Leak detection.
- PET processing.
- Pharmaceuticals.
- Transformer drying and cable fluid conditioning.

Pump Range

Stokes microvac

- 212J
- 412J
- 612J

Performance Curves

Stokes Microvac Model 212J

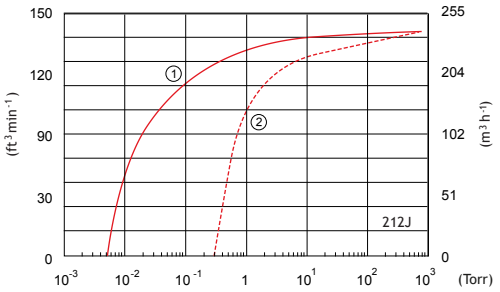
212J

Pumping speed
234 m^3h^{-1}
(138 ft^3min^{-1})
Displacement (swept volume)
255 m^3h^{-1}
(150 ft^3min^{-1})

Ordering information

Product description	Order no.
212J 230/460 V, 3Ø, 60 Hz (230/460 V coil)	900-212-014
Explosion Proof 460V Class 1 Div 1 Group C&D 460v Coil	916-212-014
575v 60 Hz 575v Coil	919-212-014
230/460v 60 Hz 110v Coil	931-212-014
380v 60 Hz 380v Coil	945-212-014
212J 230/460 V 3 PH 60 Hz (230/460 V coil) with water miser	970-212-014
212J 400 V, 3-ph, 50 Hz, IEC motor, 380 V coil (CE compliant)	900212014501
212J 400 V, 3-ph, 50 Hz, IEC motor, 415 V coil (CE compliant)	900212014502
212J 400 V, 3-ph, 50 Hz, IEC motor, 380 V coil with water miser (CE compliant)	900212014503
212J 400 V, 3-ph, 50 Hz, IEC motor 415 V coil with water miser (CE compliant)	900212014504

212J Performance Curve



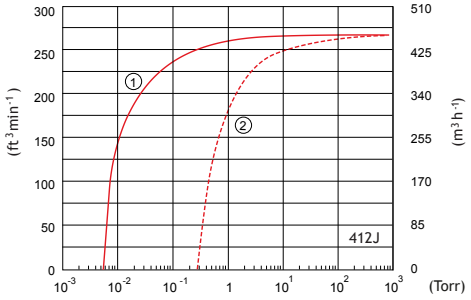
1	Without gas ballast
2	With gas ballast

Stokes Microvac Model 412J

412J

Pumping speed
422 m^3h^{-1}
(260 ft^3min^{-1})
Displacement (swept volume)
510 m^3h^{-1}
(300 ft^3min^{-1})

412J Performance Curve



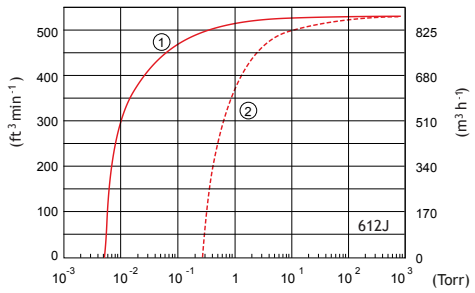
Ordering information

Product description	Order no.
412J 230/460 V, 3Ø, 60 Hz (230/460 V coil)	900-412-014
230/460V 60Hz 15 hp 230/460v coil	900-412-015
Explosion Proof 460V Class 1 Div 1 Group C&D 460v Coil	916-412-014
575v 60 Hz 575v Coil	919-412-014
230/460v 60 Hz 110v Coil	931-412-014
380v 60 Hz 380v Coil	945-412-014
412J 230/460 V 3 PH 60 Hz (230/460 V coil) with water miser	970-412-014
212J 230/460 V 3 PH 60 Hz (230/460 V coil) with water	970-212-014
412J 400 V, 3-ph, 50 Hz, IEC motor 380 V coil (CE compliant)	900412014501
412J 400 V, 3-ph, 50 Hz, IEC motor 415 V coil (CE compliant)	900412014502
412J 400 V, 3-ph, 50 Hz, IEC motor, 380 V Coil with water miser (CE compliant)	900412014503
412J 400 V, 3-ph, 50 Hz, IEC motor 415 V coil with water miser (CE compliant)	900412014504

1	Without gas ballast
2	With gas ballast

Stokes Microvac Model 612J

612J Performance Curve



1	Without gas ballast
2	With gas ballast

612J

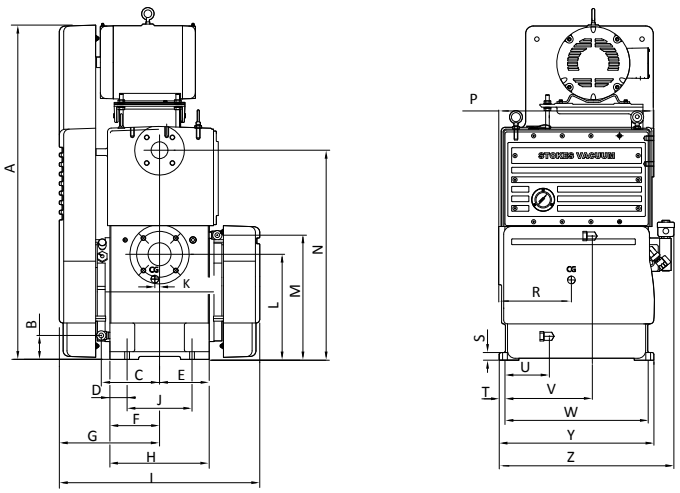
Pumping speed
884 m^3h^{-1}
(520 ft^3min^{-1})
Displacement (swept volume)
1020 m^3h^{-1}
(600 ft^3min^{-1})

Ordering information

Product description	Order no.
612J 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-612-014

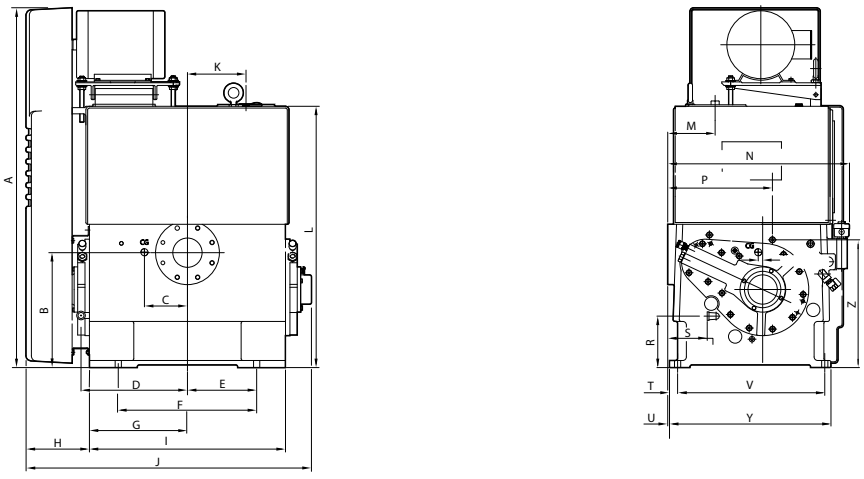
Dimensions

Stokes 212J dimensions



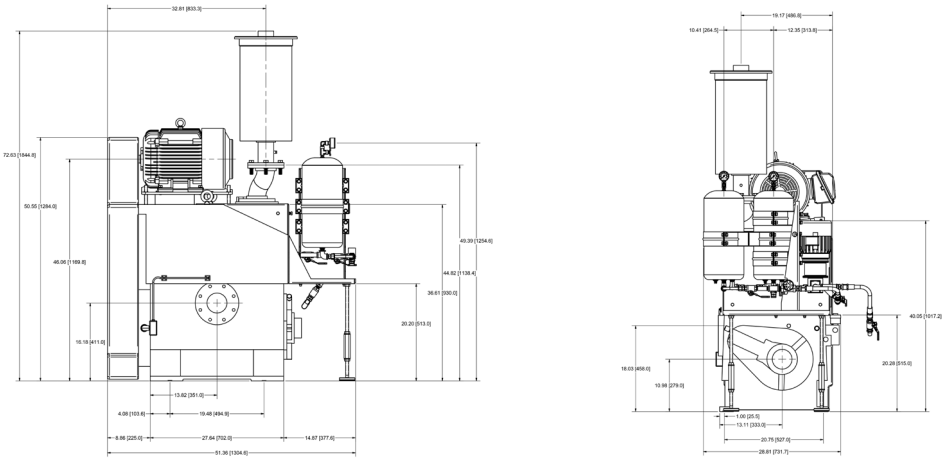
A	B	C	D	E	F	G	H	I	J	K	L
1111	79	194	57	192	165	333	330	667	216	16	349
M	N	P	R	S	T	U	V	W	Y	Z	
413	695	516	241	25	19	148	291	476	514	581	

Stokes 412J dimensions

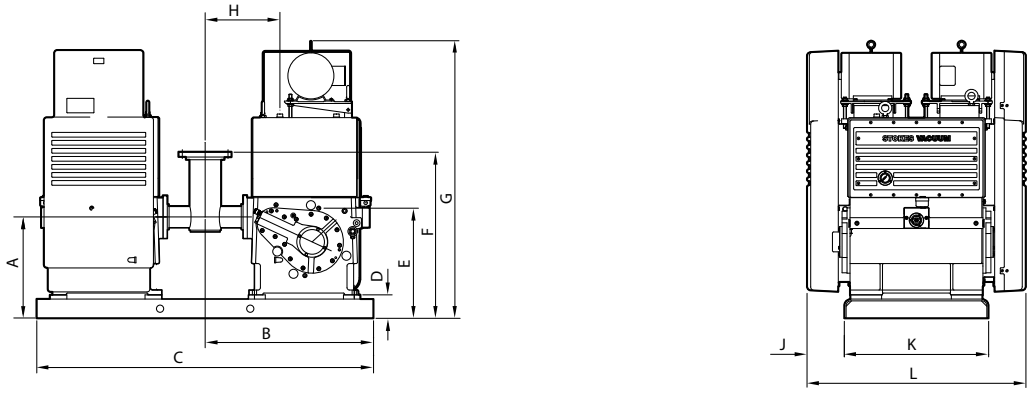


A	B	C	D	E	F	G	H	I	J	K	L
1289	411	154	381	248	495	351	229	702	1022	210	940
M	N	P	R	S	T	U	V	Y	Z		
168	651	375	184	141	29	6	527	578	457		

Stokes 412ESI dimensions



Stokes 612J dimensions



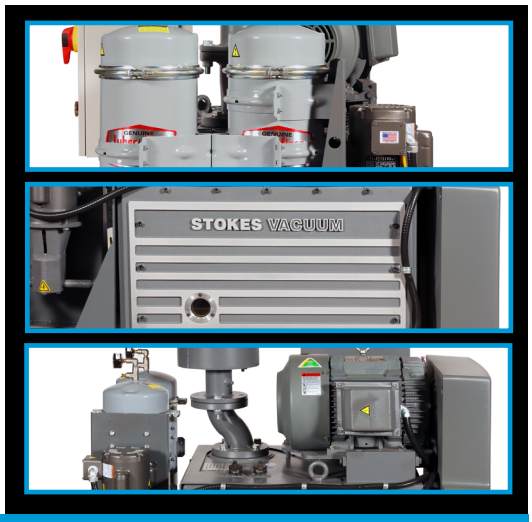
A	B	C	D	E	F	G	H	J	K	L
535	889	1778	124	581	876	1464	394	197	762	1156

Technical Data

	Units	212J	412J/ESI	612J
		Displacement (swept volume)		
	m^3h^{-1}/ft^3min^{-1}	255/150	510/300	1020/600
Pumping speed				
	m^3h^{-1}/ft^3min^{-1}	234/138	442/260	884/520
		Ultimate vacuum (total pressure)		
without gas ballast	mbar/Torr		$< 3.3 \times 10^{-2} / < 25 \times 10^{-2}$	
with gas ballast	mbar/Torr	$< 26 \times 10^{-2} / < 2 \times 10^{-2}$	$< 26 \times 10^{-1} / < 2 \times 10^{-1}$	
		Motor size (TEFC)		
50 Hz	kW IEC (CE variant)	5.5	11	11 (x2)
60 Hz	hp TEFC	7.5	10 /15	10 (x2)
Motor speed	rpm		1800	
Inlet connection	inch ASA/ANSI flange	3	4	6
Exhaust connection		2 inch ASA/ANSI flange or 2 inch NPT	3 inch ASA/ANSI flange or 3 inch NPT	2 x 3 inch ASA/ANSI flange or 3 inch NPT
Water inlet/outlet connection	inch NPT	½	½	2 x ½
Recommended cooling flow @ 85 ˚C/30°F	$lmin^{-1}/galmin^{-1}$	5.7/15	7.6/15	7.6/15 (X2)
Water vapour pumping rate	$kg\ h^{-1}/11\ lb\ h^{-1}$	5	10.45/23	20.9/46
Oil capacity	litre/gal	15/4	46/12	92/24
Recommended oil		V lube F	V lube F	V lube F
Noise	dB(A)	< 77	< 83	< 85
Weight	kg/lbs	431/950	794/1750	1724/3800

STOKES MICROVAC ESI SERIES OIL SEALED ROTARY PISTON PUMP

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE



The Stokes Microvac ESI series (Extended Service Interval) sets the standard for reduced maintenance and extended service intervals in arduous applications. The ESI series incorporates all the time proven design features of the Stokes Microvac 412J while integrating key accessories and features for improved performance in the most demanding applications. The ESI series can be retrofitted with any Microvac and or mechanical booster combination to suit your special application and pumping requirements.

Features and Benefits

- Time Proven Stokes Microvac Robust Design
- Extended Periods of User Intervention
- Suited for Metal Meting and Casting, Heat Treatment, Brazing , Sintering or any corrosive or particulate generating applications
  - On board (Integral) Positive Feed Large capacity Oil Filter
    - (Single or Dual Canister. Particulate and Acid Neutralization Elements)
    - Filter Pressure Gauge for Filter Change Notification
    - Internal By-pass enables Filter change out while operational
    - Filter Visual Oil flow Indication
  - 15 hp High Efficiency Motor
    - 4 Point Motor Platform for Consistent Belt Tension
  - Integral Oil Piping
    - Ease of Clean Oil and No Leakage

Application

- Automotive.
- General applications.
- Metallurgy.
- Vacuum coating.
- Vacuum melting.
- Chemical processing.
- Heat treatment.
- Leak detection.
- PET processing.
- Pharmaceuticals.
- Transformer drying and cable fluid conditioning.

Pump Range

- 412ESI

Stokes Microvac Model 412ESI

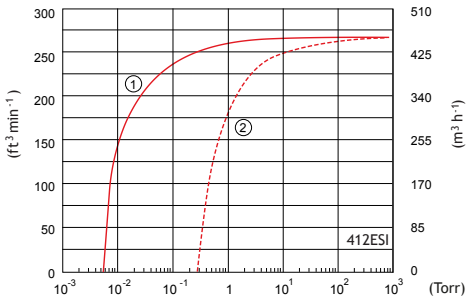
412ESI

Pumping speed
422 m^3h^{-1}
(260 ft^3min^{-1})
Displacement (swept volume)
510 m^3h^{-1}
(300 ft^3min^{-1})

Ordering information

Product description	Order no.
412ESI 230/460 V, 3Ø, 60 Hz (230/460 V coil)	NRY4Q9000

412ESI Performance Curve



1	Without gas ballast
2	With gas ballast

Refer to pages 212 and 213 for technical dimension drawings and technical data. For regional variants/voltages of the Stokes Microvac 412ESI contact your local Edwards representative.

Accessories

Water Miser

Features and Benefits

- Saves cooling water, improves efficiency.
- Remote bulb temperature sensor in oil reservoir of vacuum pump.
- Throttles valve on cooling water to control oil temperature.
- Fits most water cooled vacuum pumps.

Ordering Information

Product Description	For pump	Order no.
Water miser	149H-612J	900-412-124

Gas Ballast Silencer

- Features & benefits.
- Cuts noise level.
- Simple thread-in unit reduces noise level.
- Filters gas ballast intake air.

Ordering Information

Product Description	For pump	Order no.
151 Series gas ballast silencer/filter # required		
1	146H, 148H, 149H/S	900-151-001
1	212J	900-151-002
2 or 4	412J/612J	900-151-002

Min-Max Cooler

The Edwards Model 170-116 mini-max compact cooler provides closed circuit cooling specially designed for mobile pumping systems. It includes pump, radiator, fan, motor (115/60/1), on-off switch, connection kit for the microvac pumps, and has a cooling capacity of 14000 BTU/hr. The mini-max cooler is ideal when cooling water is not convenient or clean enough to ensure peak performance.

Technical Data

For use with Model 149, 212 & 412 Rotary Piston Pumps	
Motor	¼ hp (pump and fan)
Motor voltage	115 V, 1-ph, 60 Hz
	230 V, 1-ph, 60 Hz
Cooling capacity	14000 BTU/hour
Hose length	5 feet
Reservoir tank capacity	3 gallons
Overall dimensions	12 ¼" W x 23 ¼" l X 13 ¼" H
Weight	50 lbs

Ordering Information

Product Description	Order no.
Minimax cooling system	900-170-116
Includes: pump, radiator, fan, motors, on-off switch, piping, wiring and hoses.	

Oil Mist Separators

The 291 series oil mist separators are high performance air/oil coalescing separators that will virtually eliminate all liquids and solids from a gas stream. These units produce exhaust liquid levels as low as 0.05 PPMW and solids removal in excess of 99.79% efficiency for particulate as small as 0.3 micron.

- Features & benefits.
- Clean pump exhaust, saves oil.
- Two-stage design removes ail smog and traps particles as small as 0.3 microns.
- Standard and heavy models available.

Heavy Duty Oil Mist Filter

Heavy-duty oil mist separators are designed to handle the most severe oil exhaust situations from rotary oil sealed mechanical pumps. For true measure of efficiency, it is important to go beyond the weight to consider the actual number of particles collected. The heavy-duty oil mist separators efficiency by weight approaches 100% and total particle collection 97.8%. Edwards guarantees to collect and remove the stated percentage of particles by size, not by weight alone. The HD mist separator will effectively prevent fume emissions unlike existing separators that do not remove the sub micron particles.

Ordering Information

Product Description	For pump	CFM	Replacement elements	Order no.
Oil mist separators with fibreglass element				
291-30S	146H		085-021-473	900-291-025
291-50S	148H		085-021-474	900-291-022
291-100S	149H		085-021-475	900-291-023
291-150S	212H		085-052-035	900-291-024
291-150J	212J only		085-052-263	900-291-J24
291-300S	412H, 612H		085-052-036	900⅜-291-025
291-300J	412J only		085-052-264	900-291-J25
291-750 MB	612 MB		085-021-478	900-291-027
Oil mist separator with polypropylene element				
291-30SO	146H		085-039-836	900-291-031
291-50SO	148H		085-039-837	900-291-032
291-100SO	149H		085-039-838	900-291-033
291-150SO	212H		085-039-839	900-291-034
291-300SO	412H, 612H		085-039840	900-291-035
291-750SO	612MB		085-039-841	900-291-036
Heavy duty oil mist separators				
291- 150HD	212H and smaller	150	085-038-239	900-291-048
291-300HD	412H	300	085-038-125	900-910-049
291-600HD	612H	600	085-038-226	900-291-050
291-1000HD	Combinations	1000	085-044-934	900-291-054
291-1500HD	Combinations	1500	085045429	900291055

Oil Reservoir Heater

Edwards model 212 and 412 oil reservoir heaters are recommended for pre-heating oil in the reservoir prior to pump start up at temperatures below 55 °F. Below 1 Torr., it will help maintain the oil at a temperature high enough to prevent condensation of water vapour in the oil when running with full gas ballast. The 212 and 412 oil reservoir heaters consist of an immersion heater to be inserted into the oil reservoir and an over-temperature switch with sensing bulb to control power to the heater. The heater arrangement can be factory or field installed.

Ordering Information

Product Description	For Pump	Order no.
Oil reservoir heater	600 W 120 V	085-034-331

Vacuum Break Solenoid

- Features & Benefits
- 2-way 240 V ⅜ inch FNPT
- 2-way 110 V ⅜ inch FNPT

Ordering Information

Product Description	For Pump	Order no.
Vacuum break solenoid	All 240 V	085-046-623
	All 110 V	085-046-998

Gask-O-Seal

- Features & Benefits
- For tight joint seals
- Combination anodised aluminium retainer with Buna-N seals
- Range to 0.0001 microns

Ordering Information

Product Description	Order no.
Gask-O-Seal, Pipe size (inch)	
15	900-318-005
2	900-318-006
3	900-318-007
4	900-318-008
6	900-318-010
8	900-318-011
10	900-318-012
12	900-318-013
14	900-318-014
16	900-318-015
18	900-318-016
20	900-318-017
24	900-318-018

Flex Hose

The model 820 high vacuum hose from Edwards is an all-plastic hose with aluminium flanges tough enough for easy handling streamline use. This rugged, reliable hose is suitable for use in a temperature range of -50 °F to 150 °F, tested to 10^{-2} Torr absolute pressure

Ordering Information

Product Description	For Pump	Order no.
Series 820 high vacuum hose		
Size		
2" x 20' long	085-100-28	900-820-220
3" x 20' long	023-001-141	900-820-220
4" x 20' long	023-001-129	900-820-208

Flex Connectors

Model 315 flexible connectors feature rugged type 321 stainless steel bellows to sharply ease potential alignment and thermal expansion problems, while significantly reducing vibration transmissions from other equipment. They are designed to provide years of trouble-free service.

- Features & benefits.
- Free-formed bellows minimise stress concentration.
- Solve alignment problems.
- Convoluted bellows of AISI 321 stainless steel.
- ASA standard carbon steel flanges.
- Sizes from 15 inch to 24 inch.

Ordering Information

Product Description	Order no.
Type Standard: Flexible connector, vacuum service, convoluted, stainless steel bellows, carbon steel pipe flange, 150# ASA – both ends – 63 micro finish, Mass spec tested.	
Pipe size (inch)	
1 -1/2	900-315-005
2	900-315-006
3	900-315-008
4	900-315-009
6	900-315-011
8	900-315-012
10	900-315-013
12	900-315-014
Type CE: Flexible connector, vacuum service, convoluted, stainless steel bellows, carbon steel weld band – one end – to fit over ASA pipe for lap weld, carbon steel pipe flange, 150# ASA – one end – 63 micro finish, Mass spec tested.	
Pipe size (inch)	
1-1/2	900-315-099
3	900-315-102
4	900-315-103
6	900-315-105

Type PP: Flexible connector, vacuum service, convoluted, stainless steel bellows, carbon steel pipe ends – both ends – for butt welding, Mass spec tested.	
Pipe size (inch)	
1-1/2	900-315-069
2	900-315-070
3	900-315-072
4	900-315-073
6	900-315-075
8	900-315-076
10	900-315-077
12	900-315-078

Type EE: Flexible connector, vacuum service, convoluted, stainless steel bellows, carbon steel weld band – both ends – to fit over ASA pipe for lap weld, Mass spec tested.	
Pipe size (inch)	
2	900-315-090
4	900-315-093
6	900-315-095
8	900-315-096
10	900-315-097
12	900-315-098

Type CP: Flexible connector, vacuum service, convoluted, stainless steel bellows, carbon steel pipe end – one end – for butt welding, carbon steel pipe flange, 150# ASA – one end – 63 micro finish, Mass spec tested.	
Pipe size (inch)	
2	900-315-080
3	900-315-082
4	900-315-083
6	900-315-085
8	900-315-086
12	900-315-088

High Volume Inlet Filters

- Features & Benefits
- Traps particulates ahead of pump
- Recommended ahead of all vacuum pumps
- Provide protection to pump internals
- Extends the change interval up to 10 times
- Variety of filter elements available
- 146H pump has a 2 inch flange – 333-30A has a 1 inch flange. 333-100A (2 inch flange) can be used as an option
- 1754 and 1755 have 8 inch flange. Customer must supply an adaptor to mate with 10 inch flange on filter
- Polyester replacement element max temp 200 °F, Glastex replacement element 450 °F
- 1700 Series requires 2 replacement elements

Ordering Information

Product Description	For Pump	CFM	Order no.
Intake Pipeline Filters			
333-30A*	146H	30	900-333-031
333-50A	148H	50	900-333-032
333-100A	149H	100	900-333-033
333-165A	212J	165	900-333-034
333-330A	412J	400	900-333-035
333-750A	612J, 912J	850	900-333-036
333-1125A	1721, 1722, 1738	2000	900-333-037
333-2250A†	1739, 1733, 1754	2800	900-333-038
Spares			**Order no.**
Replacement Glastex Elements‡			
333-30A*			085-032-573
333-50A			085-032-576
333-100A			085-032-579
333-165A			085-032-582
333-330A			085-032-585
333-750A			085-032-079
333-1125A			085-032-588**
333-2250A†			085-032-591**
Replacement Polyester Elements‡			
333-30A*			085-039-010
333-50A			085-039-011
333-100A			085-039-012
333-165A			085-039-013
333-330A			085-039-014
333-750A			085-039-077
333-1125A			085-039-015**
333-2250A†			085-039-016**

* 146H Pump has a 2” Flange, Filter 333-30A has a 1” Flange.
Use Filter 333-100A w/2” Flange as an Option.
† 1754 and 1755 have 8” Flange. Customer must supply an adapter to mate w/10” Flange on Filter.
‡ Replacement Element is Polyester w/Maximum Temp of 200°F, Glastex has a Maximum Temp. of 450°F.
** Two Elements Are Required.

Small Volume Inlet Filter

Features & Benefits
For small volumes and fast pump down cycles
Effective protection from harmful solid particles of 0.01 inch or larger
Less expensive than conventional filters

Ordering Information

Product Description	Flange Size	For Pump	Replacement Elements	Order no.
Small Volume Inlet Filters				
332-3	3”	212J	085-036-701	900-332003
332-4	4”	412J	085-036-702	900-332-004
332-6	6”	612J - 912J	085-036-703	900-332-006
332-8	8”	1721-1722	085-036-704	900-332-008

Oil Purifiers

Oil purifiers continuously supply clean oil to the vacuum pump to assure peak uptime while prolonging the life of both the oil and the pump. Oil purifiers from Edwards are designed for use with rotary oil sealed pumps used in dirty applications or for corrosive and hazardous gases. These oil purifiers are commonly used in heat creating, annealing, sintering, brazing, nitriding, and metal melting. The Edwards models are available to handle hydrocarbon and inert oils for rotary oil sealed pumps up to 750 ft^3min^{-1} and can filter out solids to 3 microns.

- Features & Benefits
- Keep pump fluids cleaner
- Self-contained and portable
- Suitable for mechanical vacuum pumps up to 730 ft^3min^{-1}
- Models available for hydrocarbon and inert oils

Ordering Information

Product Description	For Pump	GPM	Elements Required	Order no.
Vacuum Pump Oil Purifiers				
339-015 (115 V, 1-ph, 60 Hz)	146, 148,149	15	1	900-339-015
339-015 CE (230 V, 1-ph, 50 Hz)	146, 148, 149	12	1	900339015501
339-015 CE (200/400 V, 3-ph, 50 Hz)	146, 148, 149	12	1	900339015502
339-030 (115 V, 1-ph, 60 Hz)	212, 412	3	1	900-339-030
339-030 CE (200/400 V, 3-ph, 50 Hz)	212, 412	23	1	900339030501
339-215 (115v 1 ph. 60 Hz)	All	15	2	900-339-215
Special service (all pumps)				
339-15 (115 V,1-ph, 60 Hz)*	146, 148, 149	15	1	900-339-151
339-152 (115 V, 1-ph, 60 Hz)†	146-412	15	2	900-339-152
339-252 (115 V, 1-ph, 60 Hz)†	146-412	15	4	900-339-252
Spares				Order no.
Standard 339 Filter Fullers Earth 10 microns				085-033-395
Standard 339 Filter Pleated Paper 3 microns				085-039-432
Standard 339 Filter Activated Alumna				085-039-890
Special Service 339 Pleated Paper 3 microns				085-037-794
Special Service 339 Activated Alumna				085-039-956

Note: the 215 is the only one that is dual canister all the above are single canister
* Single element canister
† Double element canister

MV SERIES VERTICALLY ORIENTED MICROVAC BOOSTER COMBINATIONS

Edwards multi-stage pumping systems, backed by over a century of in-depth applications knowledge and technical experience. These compact, efficient pumping systems feature a Stokes Microvac pump and rugged, proven Stokes 6" Series boosters or the Edwards EH series with patented hydrokinetic drive.

The MV Series Mechanical Booster Pump Packages comprises of either the Stokes 212J or 412J rotary piston pump. Each can be directly coupled with a range of mechanical booster pumps. The range includes Edwards EH series offering the patented Hydrokinetic Drive or the full range of Stokes 6" series. All are vertical gas flow orientation for a compact space saving design. The MV Series offers a broad selection of configurations which enables the flexibility to mix and match the complete range of Stokes Microvac accessories along with various electrical control options. This enables the user to customise the pumping package to meet their application requirements.

MV Series Oil Sealed Piston Pumps and Mechanical Booster Combinations

M	Y										

CE Marking

0 No CE mark required
1 CE marked system

Microvac Pump

1 212J No CE Marked System
2 212J CE Marked System
3 412J No CE Marked System
4 412J CE Marked System
5 212J with base No CE Marked System
6 212J with base CE Marked System
7 412J with base No CE Marked System
8 412J with base CE Marked System

Booster

0 No Booster
1 EH250
2 EH500
3 EH1200
4 EH2600
5 EH4200
6 EH250 with 3" ASA inlet (for EH250)
7 EH500 with 4" ASA inlet (for EH500)
8 EH1200 with 6" ASA inlet
9 EH2600 with 8" ASA inlet
A 607 low speed low power
B 607 low speed high power
B 607 low speed high power
C 615 low speed
D 615 high speed
E 61B low speed
F 61B high speed
G 622 high speed
H 607 high speed (EU and Asia)

Oil Mist Filter

0 No mist filter
1 MF 291-150J
2 MF 291-300J

Cooling Options

0 No cooling options
1 Water miser (TCV)
2 Min max cooler 115 V 1-ph 60 Hz
3 Min max cooler 230 V 1-ph 60 Hz

Motor Control Module

0 No Motor Control / No Pressure Switch
1 Motor starter control box pedestal mount without pressure
2 Motor starter control box wall mount without pressure
3 Motor starter control box pedestal mount with pressure
4 Pressure switch only
5 Motor starter control box wall mount with pressure

Coil Voltage

1 Coil Voltage 24 V AC 50 Hz
2 Coil Voltage 24 V AC 60 Hz
3 Coil Voltage 120 V 60 Hz / 110 V 50 Hz
4 Coil Voltage 240 V 60 Hz / 220 V 50 Hz
5 Coil Voltage 380 V 50 Hz (CE)
6 Coil Voltage 415 V 50 Hz (CE)
7 Coil Voltage 480 V 60 Hz / 440 V 50 Hz
8 Coil Voltage 380 V 60 Hz

Motor Voltage

1 230V 3-ph 60 Hz
2 460V 3-ph 60 Hz (for Non CE marked systems)
3 400V 3-ph 50 Hz (only for CE Marked systems)
4 220V 3-ph 50 Hz (for Non CE marked systems)
5 380V 3-ph 50 Hz (for Non CE marked systems)
6 440V 3-ph 50 Hz (for Non CE marked systems)
7 380V 3-ph 60 Hz (for Non CE marked systems)
8 200V 3-ph 60Hz (for Non CE marked systems)
9 200V 3-ph 50Hz (for Non CE marked systems)

Gas Ballast Silencer & Vacuum Break

0 No Gas ballast, No Silencer
1 Gas Ballast Silencer (212J / 412J)
2 Auto gas ballast 24 V AC 60 Hz
3 Auto gas ballast 24 V DC DIN
4 Auto gas ballast 120 V 60 Hz / 110 V 50 Hz

Oil Purifier and Connection Kit

0 No oil purifier
1 OP 339-030 115 V 1-ph 60 Hz
2 OP 339-030CE 230 V 1-ph 50 Hz
3 OP 339-030CE 200/400 V 3-ph 50 Hz
4 OP 339-215 115 V 1-ph 60 Hz

Note* Above booster combinations are direct mount vertical flow.
Note** Oil mist filters and min max coolers will ship separately unless ordered with base frame.
Note*** Oxygen service pumps are available, please contact your local Edwards representative to discuss your requirements.
Note**** Not applicable in CE versions.
For other possible combinations, please contact your local Edwards representative to discuss your requirements.

Note: please click on the link: http://edwebid3.edwardshighvacuum.net/Edconfigurator/index.aspx to order your pump & booster combination or a system.

STOKES 1700 SERIES MECHANICAL BOOSTER COMBINATIONS

MAXIMISE YOUR PRODUCTIVITY AND PERFORMANCE

Whether you need to increase the capacity of your existing system or achieve peak performance for a new installation; Edwards makes taking advantage of the latest technology easy. These field-proven pumping systems are the workhorse of countless industrial and large chamber applications. Each Stokes1700 series mechanical booster pump combination includes a Stokes Microvac backing pump and a belt driven, horizontal flow, high vacuum Stokes 6” series mechanical booster pump. In harsh applications where chemical or particulate contamination is present, process isolation boosters are available as an option. Controls for Stokes 1700 series mechanical booster pump combination include a pressure switch, motor starters, overloads, remote booster selection switch and lights for pump running and fault indication.

Features and Benefits

- **Reliable**
  Over 80 years of time tested proven performance with experienced service and technical support.
- **Robust**
  Easy on-site maintenance – robust simple mechanism for high reliability and ease of rebuild
  Highly reliable – ability to handle harsh processes.
- **Flexible**
  Configured for you – choice of pumping combinations available with a variety of 6” boosters and rotational speed
  Optimise the configuration for your process.
- **Reassurance**
  Up to date technology – continued investment in design and technology improvements.

Applications

- Vacuum Heat Treatment
- Vacuum Melting
- Metallurgical
- Transformer Drying
- Vacuum Coating
- General Industrial Applications
- Leak Detection

Pump Range

Stokes 1700

- 1721
- 1721S
- 1722
- 1722S
- 1733
- 1733HC
- 1738
- 1738HC
- 1738BP
- 1738HCBP
- 1739
- 1739HC
- 1739BP
- 1739HCBP
- 1754
- 1754HC

Performance Curves

1721 & 1721S

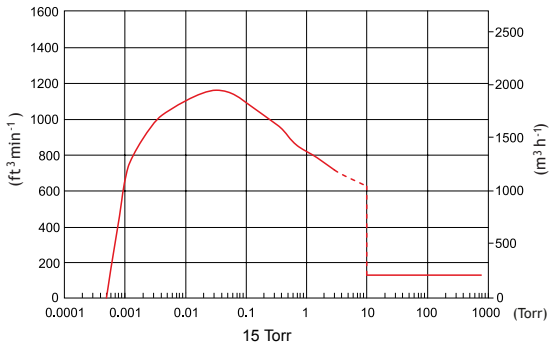
1721 & 1721S

Booster Displacement	
	2210 -2720 m^3h^{-1}
	(1300 - 1600 ft^3min^{-1})
Booster Speed	
	1800 - 2200 rpm
Pump Displacement	
	255 m^3h^{-1}
	(150 ft^3min^{-1})

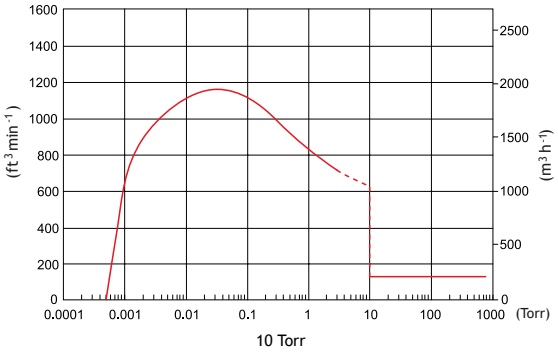
Ordering information

Product description	Order no.
1721 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-170-061
1721S 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-170-074

1721 Performance Curve



1721S Performance Curve



1722 & 1722S

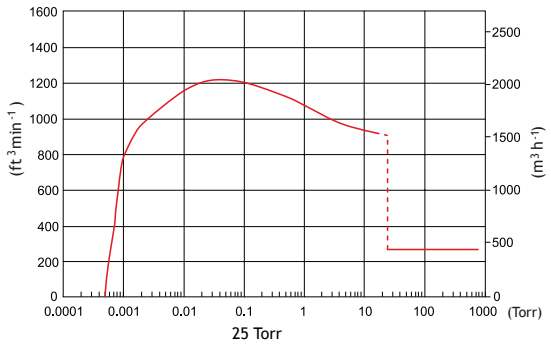
1722 & 1722S

Booster Displacement	
	2210 -2720 m^3h^{-1}
	(1300 - 1600 ft^3min^{-1})
Booster Speed	
	1800 - 2200 rpm
Pump Displacement	
	510 m^3h^{-1}
	(300 ft^3min^{-1})

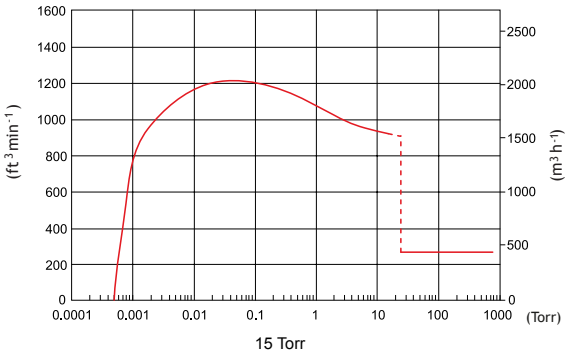
Ordering information

Product description	Order no.
1722 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-170-062
1722S 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-170-075

1722 Performance Curve

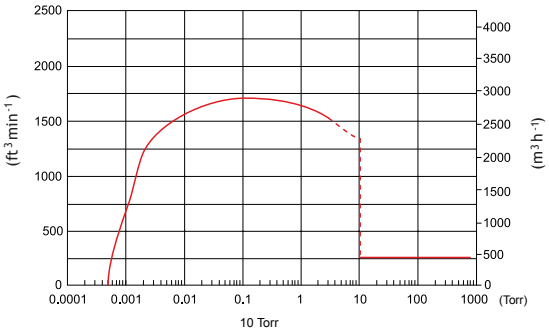


1722S Performance Curve



1738 & 1739

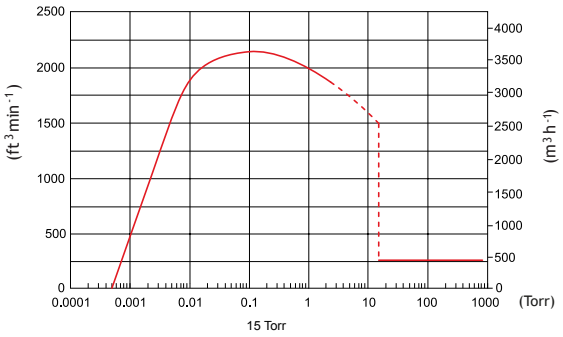
1738 Performance Curve



1738 & 1739

Booster Displacement
3398-4420 m^3h^{-1}
(2000-2600 ft^3min^{-1})
Booster Speed
2750-3600 rpm
Pump Displacement
510 m^3h^{-1}
(300 ft^3min^{-1})

1739 Performance Curve

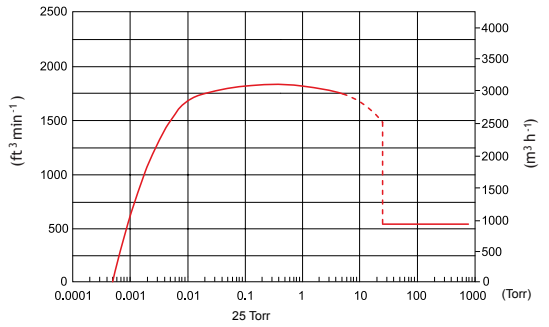


Ordering information

Product description	Order no.
1738 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-170-038
1739 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-170-039

1738 HC & 1739 HC

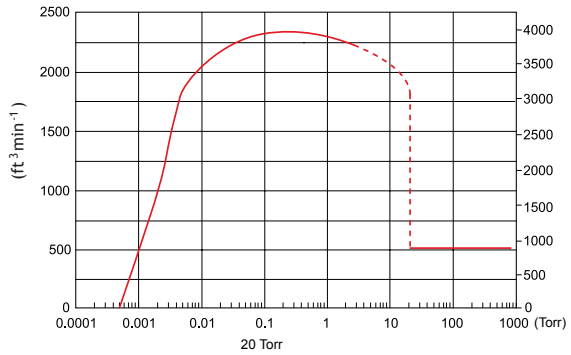
1738 HC Performance Curve



1738 HC & 1739 HC

Booster Displacement
3398-4420 m^3h^{-1}
(2000-2600 ft^3min^{-1})
Booster Speed
2750-3600 rpm
Pump Displacement
1020 m^3h^{-1}
(600 ft^3min^{-1})

1739 HC Performance Curve



Ordering information

Product description	Order no.
1738HC 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-17C-038
1739HC 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-17C-039

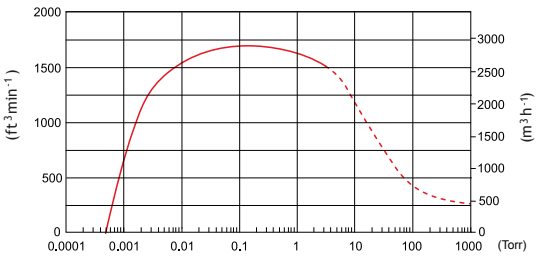
Performance Curves

1738 BP & 1739 BP

1738 BP & 1739 BP

Booster Displacement	
	3398 - 4420 m^3h^{-1}
	(2000 - 2600 ft^3min^{-1})
Booster Speed	
	2750 - 3600 rpm
Pump Displacement	
	510 m^3h^{-1}
	(300 ft^3min^{-1})

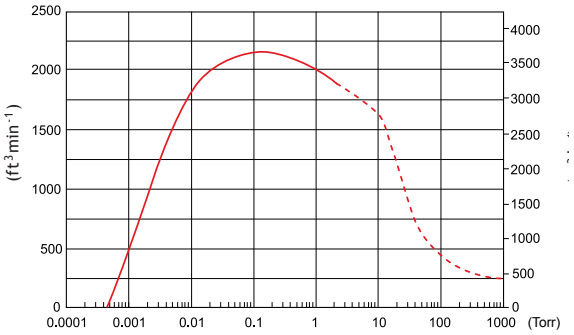
1738 BP Performance Curve



Ordering information

Product description	Order no.
1738BP 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-170-38B
1739BP 230/460V, 3Ø, 60 Hz with 230/460V Coil	900-170-39B

1739 BP Performance Curve

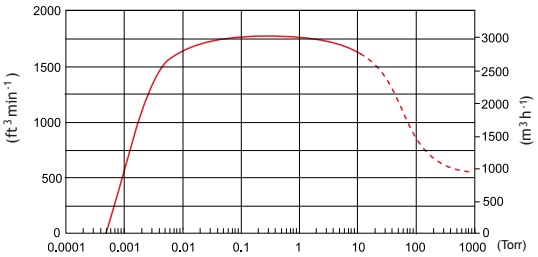


1738 HCBP & 1739 HCBP

1738 HCBP & 1739 HCBP

Booster Displacement	
	3398 - 4420 m^3h^{-1}
	(2000 - 2600 ft^3min^{-1})
Booster Speed	
	2750 - 3600 rpm
Pump Displacement	
	1020 m^3h^{-1}
	(600 ft^3min^{-1})

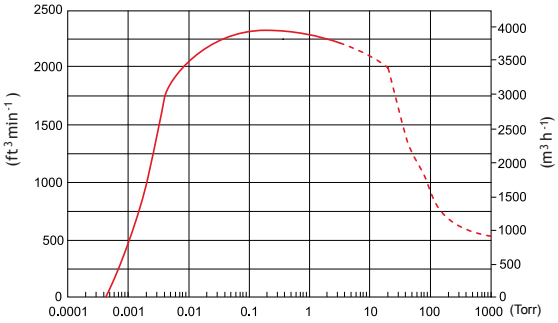
1738 HCBP Performance Curve



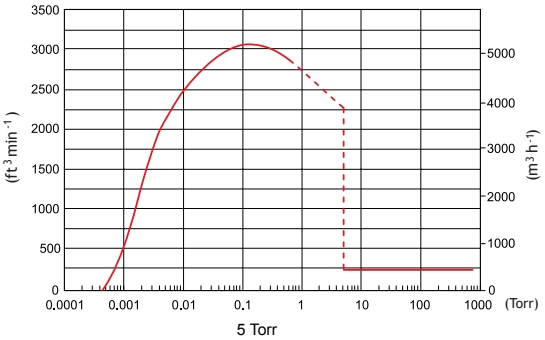
Ordering information

Product description	Order no.
1738HCBP 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-17C-38B
1739HCBP 230/460V, 3-ph, 60 Hz (230/460 V coil)	900-17C-39B

1739 HCBP Performance Curve



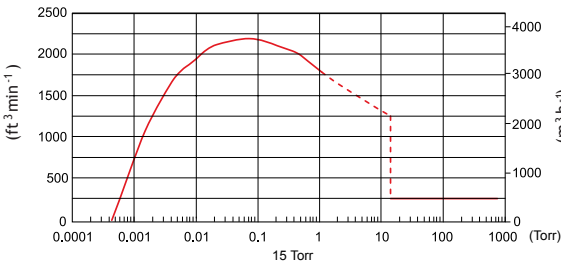
1733 Performance Curve



1733 & 1754

Booster Displacement
6358-5100 m^3h^{-1}
(3840-3000 ft^3min^{-1})
Booster Speed
2750-3600 rpm
Pump Displacement
510 m^3h^{-1}
(300 ft^3min^{-1})

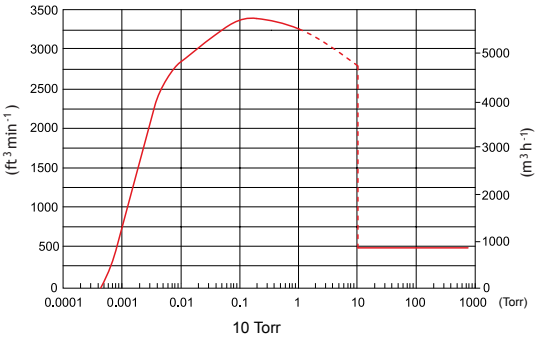
1754 Performance Curve



Ordering information

Product description	Order no.
1733 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-170-S33
1754 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-170-054

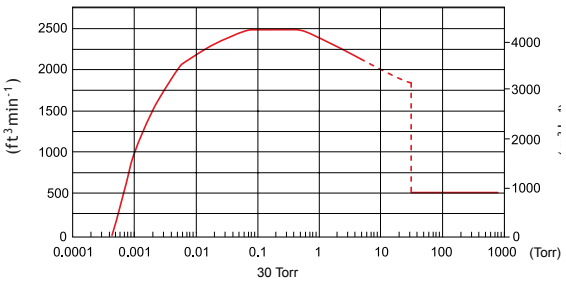
1733 HC Performance Curve



1733 HC & 1754 HC

Booster Displacement
6358-5100 m^3h^{-1}
(3840-3000 ft^3min^{-1})
Booster Speed
2750-3600 rpm
Pump Displacement
1020 m^3h^{-1}
(600 ft^3min^{-1})

1754 HC Performance Curve

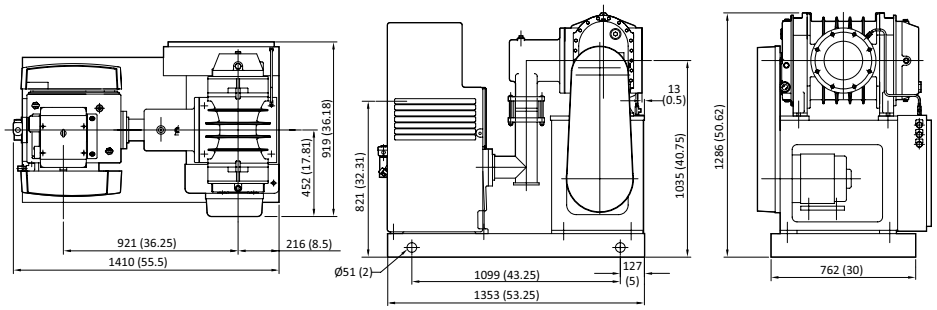


Ordering information

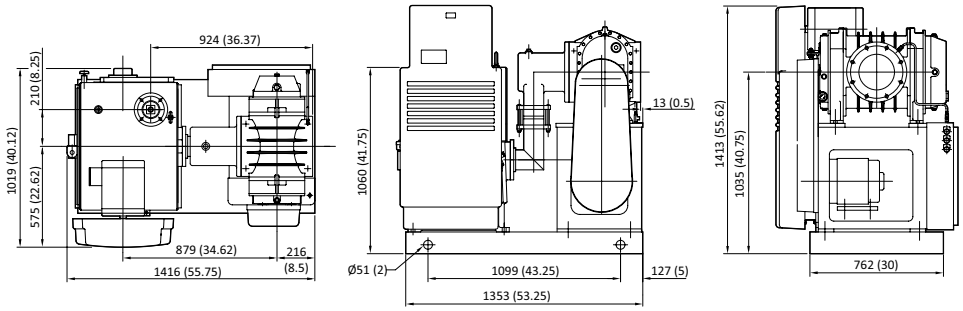
Product description	Order no.
1733HC 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-170-S34
1754HC 230/460 V, 3-ph, 60 Hz (230/460 V coil)	900-170-055

Dimensions

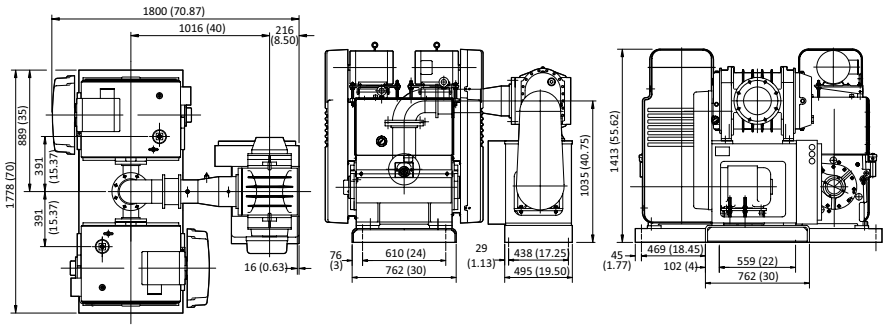
1721/1721S dimensions



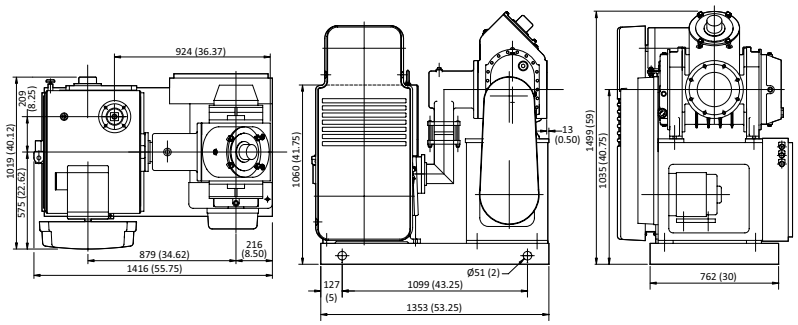
1722/1722S/1738/1739 dimensions



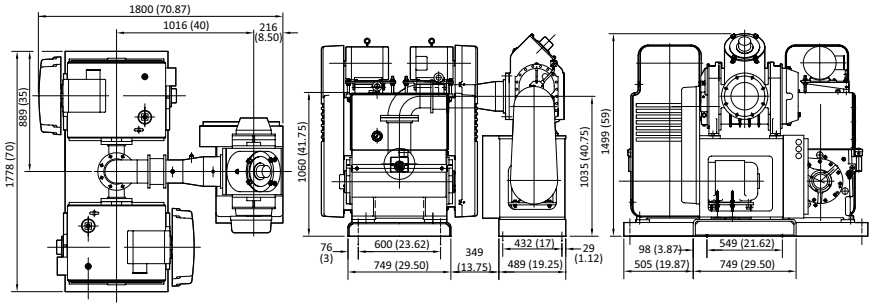
1738HC/1739HC dimensions



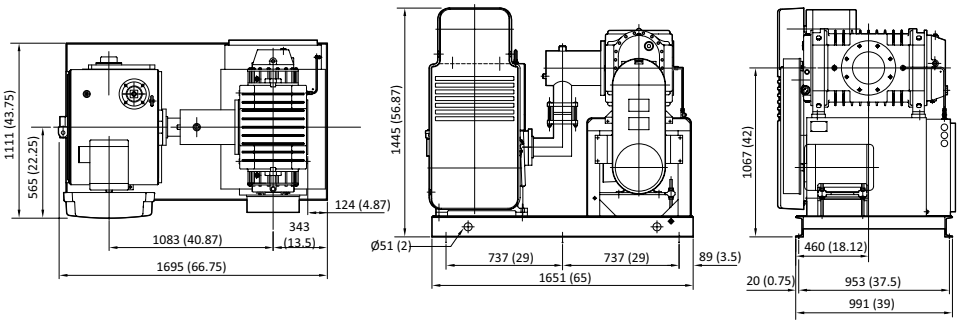
1738BP/1739BP dimensions



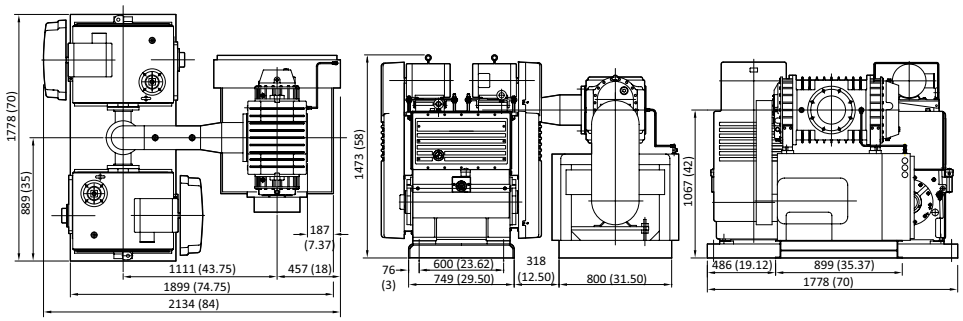
1738HCBP/1739HCBP dimensions



1754/1733 dimensions



1754HC/1733HC dimensions



Technical Data

	Units	1721	1721S	1722	1722S
Booster displacement	m^3h^{-1}/ft^3min^{-1}	2210/1300	2720/1600	2210/1300	2720/1600
Booster speed	rpm	1800	2200	1800	2200
Booster orientation		Horizontal			
Pump displacement	m^3h^{-1}/ft^3min^{-1}	255/150		510/300	
Pressure switch required		Yes	Yes	Yes	Yes
Normal cut-in pressure	mbar/Torr	20/10	13/10	33/25	20/15
Continuous operation pressure limit	mbar/Torr	4/3	26/2	20/15	10.7/8
Booster drive	kW/hp	5.6/7.5	7.5/10	5.6/7.5	7.5/10
Pump drive (TEFC)	kW/hp	5.6/7.5	6.5/7.5	7.5/10	7.5/10
Inlet connections		8 inch ASA/ANSI flange			
Discharge connections		2 inch ASA/ANSI flange, 2 inch NPT		3 inch ASA/ANSI flange, 3 inch NPT	
Water inlet/outlet connection		½ inch NPT			
Recommended cooling flow @ 30 °C/85 °F	$lmin^{-1}/galmin^{-1}$	5.7/15		7.6/2	
Booster oil capacity (V lube H)	litre/US gal	19/0.51			
Microvac oil capacity (V lube F)	litre/US gal	15/4		46/12	
Inlet height	mm/inch	1035/40.75			
Footprint (L x W x H)	mm	1419 x 919 x 1260		1407 x 1048 x 1438	
	inch	55.87 x 36.18 x 49.61		55.40 x 4126 x 56.61	
Weight	kg/lbs	1225/2700	1270/2800	1588/3500	1633/3600

	Units	1738	1739	1738HC	1739HC
Booster displacement	m^3h^{-1}/ft^3min^{-1}	3398/2000	4420/2600	3398/2000	4420/2600
Booster speed	rpm	2750	3600	2750	3600
Booster orientation		Horizontal			
Pump displacement	m^3h^{-1}/ft^3min^{-1}	510/300		1020/600	
Pressure switch required		Yes			
Normal cut-in pressure	mbar/Torr	13/10	13/15	33/25	33/20
Continuous operation pressure limit	mbar/Torr	4/3	27/2	6.7/5	3.4/25
Booster drive	kW/hp	7.5/10	224/30	7.5/10	18.6/25
Pump drive (TEFC)	kW/hp	7.5/10	7.5/10	7.5 (x2)/10 (x2)	7.5 (x2)/10 (x2)
Inlet connections		8 inch ASA/ANSI flange			
Discharge connections		3 inch ASA/ANSI flange, 3 inch NPT		3 inch ASA/ANSI flange, 3 inch NPT (x2)	
Water inlet/outlet connection		½ inch NPT		½ inch NPT (x2)	
Recommended cooling flow @ 30 °C/85 °F	$lmin^{-1}/galmin^{-1}$	7.6/2		7.6 (x2)/2 (x2)	
Booster oil capacity (V lube H)	litre/US gal	19/0.51			
Microvac oil capacity (V lube F)	litre/US gal	46/12		92/24	
Inlet height	mm/inch	1035/40.75	1067/42		
Footprint (L x W x H)	mm	1407 x 1048 x 1438	1905 x 1270 x 1318		
	inch	55.40 x 4126 x 56.61	75 x 50 x 5189		
Weight	kg/lbs	1633/3600	1803/3975	2404/5300	2733/6025

	Units	1738 BP	1739 BP	1738 HCBP	1739 HCBP
Booster displacement	m^3h^{-1}/ft^3min^{-1}	3398/2000	4420/2600	3398/2000	4420/2600
Booster speed	rpm	2750	3600	2750	3600
Booster orientation		Horizontal			
Pump displacement	m^3h^{-1}/ft^3min^{-1}	510/300		1020/600	
Pressure switch required		No	No	No	No
Continuous operation pressure limit	mbar/Torr	4/3	27/2	6.7/5	4/3
Booster drive	kW/hp	11/15	22/30	112/15	18.6/25
Pump drive (TEFC)	kW/hp	7.5/10		7.5 (x2)/10 (x2)	
Inlet connections		8 inch ASA/ANSI flange			
Discharge connections		3 inch ASA/ANSI flange, 3 inch NPT		3 inch ASA/ANSI flange, 3 inch NPT (x2)	
Water inlet/outlet connection		½ inch NPT		½ inch NPT (x2)	
Recommended cooling flow @ 30°C/85 °F	$lmin^{-1}/galmin^{-1}$	7.6/2		7.6 (x2)/2 (x2)	
Booster oil capacity (V lube H)	litre/US gal	19/0.51			
Microvac oil capacity (V lube F)	litre/US gal	46/12		92/24	
Weight	kg/lbs	1690/3725	1837/4050	2449/5400	2767/6100

	Units	1733	1754	1733 HC	1754 HC
Booster displacement	m^3h^{-1}/ft^3min^{-1}	6538/3840	5100/3000	6538/3840	5100/3000
Booster speed	rpm	3600	2750	3600	2750
Booster orientation		Horizontal			
Pump displacement	m^3h^{-1}/ft^3min^{-1}	510/300		1020/600	
Pressure switch required		Yes	Yes	Yes	Yes
Normal cut-in pressure	mbar/Torr	6.7/5	20/15	13.3/10	40/30
Continuous operation pressure limit	kW/hp	0.8/0.6	13/1	13/1	4/3
Booster drive	kW/hp	18.5/25	15/20	225/30	18.5/25
Pump drive		7.5/10		7.5 (x2)/10 (x2)	
Inlet connections		8 inch ASA/ANSI flange			
Discharge connections		3 inch ASA/ANSI flange, 3 inch NPT		3 inch ASA/ANSI flange, 3 inch NPT (x2)	
Water inlet connection		½ inch NPT (2)		½ inch NPT (x2)	
Water outlet connection		½ inch NPT			
Recommended cooling flow @ 30°C/85 °F	$lmin^{-1}/galmin^{-1}$	7.61/2		7.61 (x2)/2 (x2)	
Booster oil capacity (V lube H)	litre/US gal	19/0.51		19/0.51	
Microvac oil capacity (V lube F)	litre/US gal	46/12		92/24	
Weight	kg/lbs	1710/3770	1678/3700	2767/6100	2722/6000