EM Oil Sealed Rotary Pumps

Edwards rugged two stage mechanical oil sealed pumps are available in sizes from 40 to 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 vapors, 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 vapors within the normal operating parameters of the pump.

Flammable gases and vapors 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.

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	Ⓔx II 3 Gc IIB T4	Ⓔx II 2 G IIB T4
E2M175 & E2M275	Ⓔx II 3 Gc IIB T3	Ⓔx II 2 G IIB T160

Where the following classification...

Symbol	Meaning
Ⓔx	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 pressurized 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 (11.6 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 re-used. 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 EOF's with the EM oil-sealed rotary pumps, to remove particulates trapped in the pump oil. There are two types of EOF filter.

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.

EOF pumped external oil filters have their own oil re-circulation pump. The re-circulation pump has a high flow rate and allows large quantities of oil to be filtered. The filter is fitted with a gauge which indicates when the filter need to be changed. This filter is suitable for hydrocarbon and PFPE oils.

Pumping Vapors

The use of gas ballast significantly improves vapor 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 vapor 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 vapors 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 vapor. However, oil sealed pumps can not 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 vapors 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 minimize the impact of gases and vapors 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 vapor. 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 (vapor) from the process gases exhausted from the outlet of an oil sealed pump. The filters remove both odor and oil vapor 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 vapor to back migrate into the process chamber. The back-migration of oil vapor 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 vapor and to prevent back migration.

Applications

- Refrigeration dehydration
- Brake line evacuation
- TV aluminizers
- 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 Two Stage Rotary Vacuum Pumps

Edwards E2M40 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 the widest variety of vacuum applications.

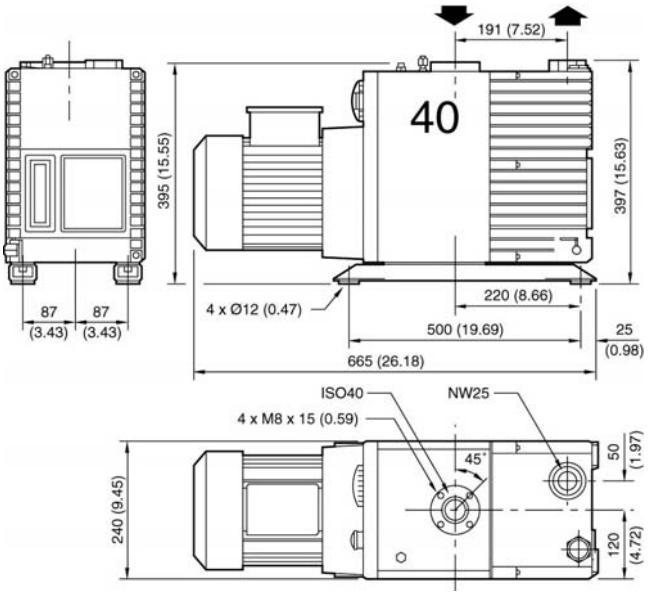
Features & Benefits

- Advanced pressurised oil circuit to give effective lubrication even under high gas loads
- When the pump is switched off, the spring loaded distributor valve provides oil and air suck-back protection
- Gas Ballast control to assist in handling high water vapour loads
- Industrial roller bearings on drive shaft for ultimate reliability and long, trouble free life
- Full height oil sight glass for easy checking of oil level and condition

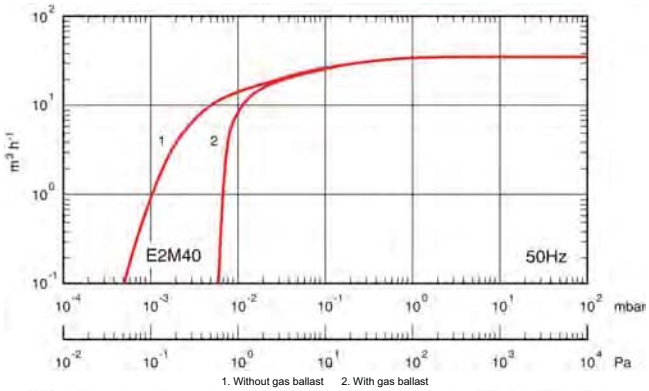
Applications

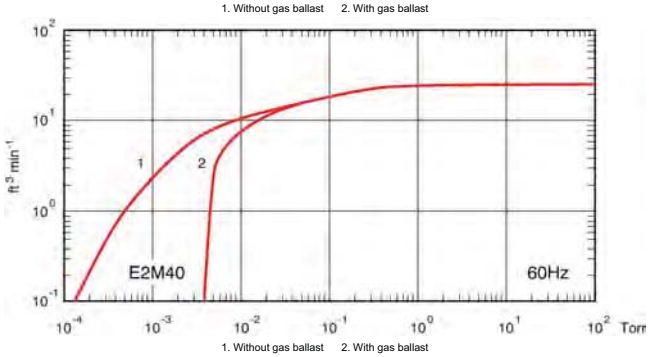
- Vacuum metallurgy processes
- Thin film coating technologies
- Pharmaceutical freeze drying
- Refrigeration and air conditioning system evacuation, drying, and backfilling
- Transformer and cable drying and impregnation, insulating oil treatment plant

Dimensions



Performance Curves





Technical Data

Displacement	
50Hz	42.5 $m^3 h^{-1}$ / 25 $ft^3 min^{-1}$
60Hz	50.5 $m^3 h^{-1}$ / 29.7 $ft^3 min^{-1}$
Speed (Pneurop)	
50Hz	37 $m^3 h^{-1}$ / 21.8 $ft^3 min^{-1}$
60Hz	44 $m^3 h^{-1}$ / 25.9 $ft^3 min^{-1}$
Number of stages	2
Ultimate vacuum (total pressure)	
Without gas ballast	1.0×10^{-3} mbar / 7.7×10^{-4} Torr
With gas ballast	7.0×10^{-3} mbar / 5.4×10^{-3} Torr
Inlet connection	ISO40
Outlet connection	25 mm flange suitable for NW25
Maximum outlet pressure	0.5 bar gauge
Maximum inlet pressure for water vapor	0.2 kg h^{-1} / 0.4 lb h^{-1}
Weight	72 kg / 159 lb
Motor protection rating	IP44 or IP54
Motor power	
50Hz	1.1 kW / 1.5 hp
60Hz	1.5 kW / 2 hp
Standard oil capacity	
maximum	3.5 liter / 3.2 qt
minimum	1.32 liter / 1.6 qt
PFPE oil capacity	
Maximum	3.5 liter / 3.2 qt
Minimum	1.32 liter / 1.6 qt
Recommended oil	Ultragrade 70
Noise level	65 dB (A)

Ordering Information

Product Description	Order No.
E2M40 220-240 / 380-415V, 3-ph, 50Hz	A36401935
E2M40 208-230/460V, 3-ph, 60Hz	A36402982
E2M40T4 400V, 3-ph, 50Hz	A36418993
E2M40FX 220-240/380-415V, 3-ph, 50Hz	A36411935
E2M40FX 208-230/460V, 3-ph 60Hz	A36411982
Accessories & Spares	**Order No.**
Spares Kit C&O E1/2M40 HC/F	A34401131
Spares Kit Blade E1M40	A34401050
Spares Kit Blade E2M40	A36401050
Spares Kit Major E1M40	A34401814
Spares Kit Major Service E2M40	A36401814

E2M80 Two Stage Rotary Vacuum Pumps

Edwards E2M80 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.

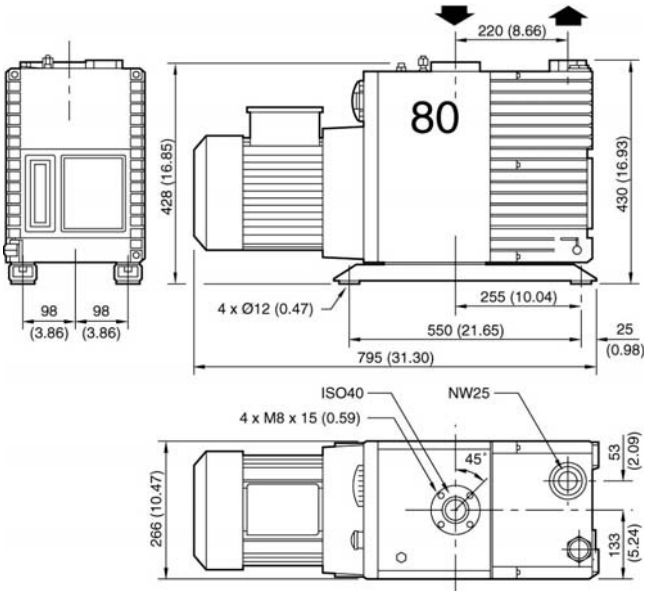
Features & Benefits

- Advanced pressurised oil circuit to give effective lubrication even under high gas loads
- When the pump is switched off, the spring loaded distributor valve provides oil and air suck-back protection
- Gas Ballast control to assist in handling high water vapour loads
- Industrial roller bearings on drive shaft for ultimate reliability and long, trouble free life
- Full height oil sight glass for easy checking of oil level and condition

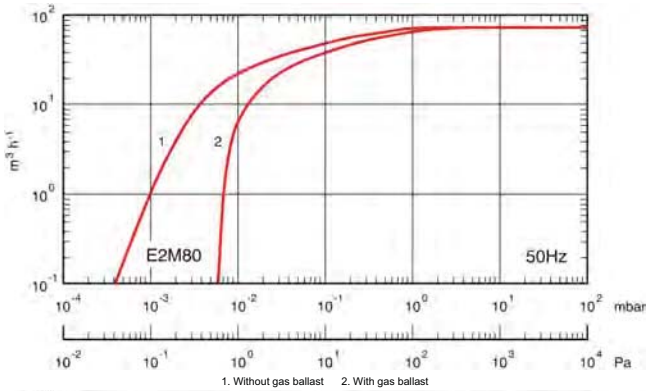
Applications

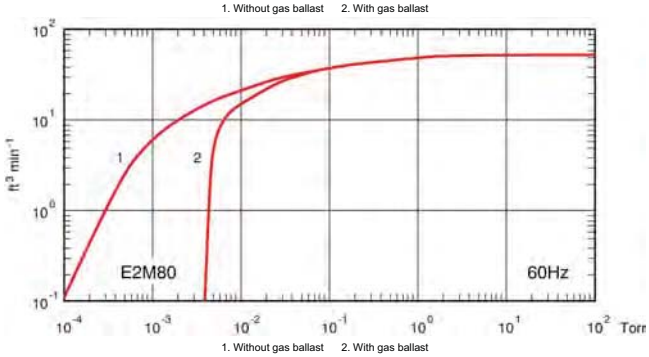
- Vacuum metallurgy processes
- Thin film coating technologies
- Pharmaceutical freeze drying
- Refrigeration and air conditioning system evacuation, drying, and backfilling
- Transformer and cable drying and impregnation, insulating oil treatment plant

Dimensions



Performance Curves





Technical Data

Displacement	
50Hz	80 $m^3 h^{-1}$ / 47.1 $ft^3 min^{-1}$
60Hz	96 $m^3 h^{-1}$ / 56.5 $ft^3 min^{-1}$
Speed (Pneurop)	
50Hz	74 $m^3 h$-1 / 43.6 $ft^3 min^{-1}$
60Hz	90 $m^3 h$-1 / 53 $ft^3 min^{-1}$
Number of stages	2
Ultimate vacuum (total pressure)	
Without gas ballast	1.0 x 10^{-3} mbar / 7.7 x 10^{-4} Torr
With gas ballast	7.0 x 10^{-3} mbar / 5.4 x 10^{-3} Torr
Inlet connection	ISO40
Outlet connection	25 mm flange suitable for NW25
Maximum outlet pressure	0.5 bar gauge
Maximum inlet pressure for water vapor	0.3 kg h^{-1} / 0.7 lb h^{-1}
Weight	105 kg / 231 lb
Motor protection rating	IP44 or IP54
Motor power	
50Hz	2.2 kW / 3 hp
60Hz	3 kW / 4 hp
Standard oil capacity	
maximum	6.3 liter / 6.7 qt
minimum	4 liter / 4.2 qt
PFPE oil capacity	
Maximum	4.01 liter / 4.2 qt
Minimum	2.19 liter / 2.3 qt
Recommended oil	Ultragrade 70
Noise level	70 dB (A)

Ordering Information

Product Description	Order No.
E2M80 208-230/460V, 3-ph, 60Hz	A36502982
E2M80 220-240/380-415V, 3-ph, 50Hz	A36501935
E2M80T4 400V, 3-ph, 50Hz	A36518993
E2M80FX 220-240/380-415V, 3-ph, 50Hz	A36511935
E2M80FX, 208-230/460V, 3-ph, 60Hz	A36511982
Accessories & Spares	**Order No.**
Spares Kit C&O E1/2M80 HC/F	A34501131
Spares Kit Blade E2M80	A36501050
Spares Kit Blade E1M80	A34501050
Spares Kit Major Service E1M80	A34501814
Spares Kit Major Service E2M80	A36501814

E2M175 Two Stage Rotary Vacuum Pumps

Edwards E2M175 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.

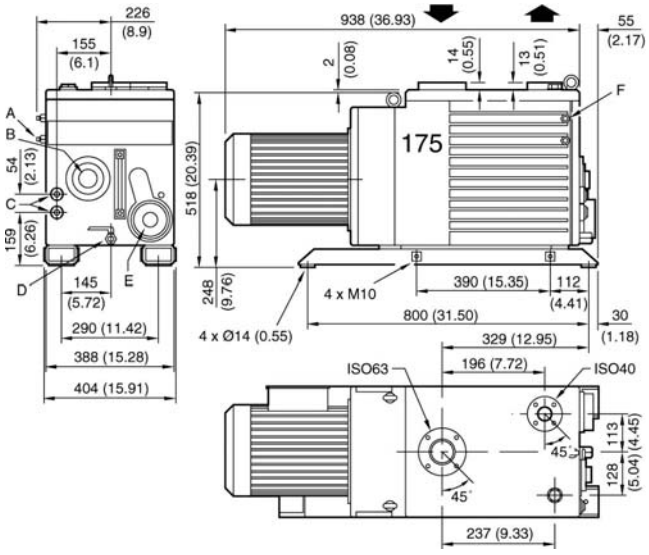
Features & Benefits

- Advanced pressurised oil circuit to give effective lubrication even under high gas loads
- When the pump is switched off, the spring loaded distributor valve provides oil and air suck-back protection
- Gas Ballast control to assist in handling high water vapour loads
- Industrial roller bearings on drive shaft for ultimate reliability and long, trouble free life
- Full height oil sight glass for easy checking of oil level and condition

Applications

- Vacuum metallurgy processes
- Thin film coating technologies
- Pharmaceutical freeze drying
- Refrigeration and air conditioning system evacuation, drying, and backfilling
- Transformer and cable drying and impregnation, insulating oil treatment plant

Dimensions



A Union for oil return connection from oil mist filter

B Gas ballast control valve

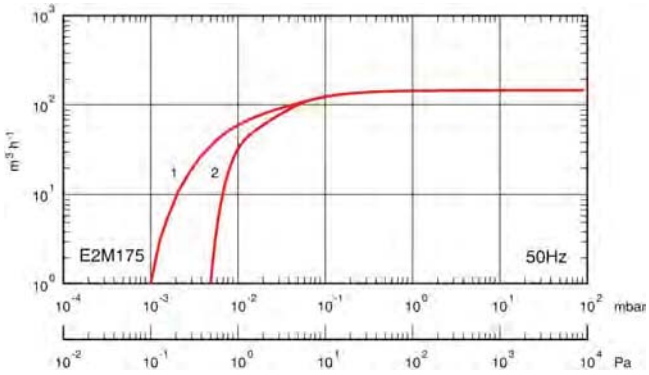
C Water connections (tapped 3/8 in BSP)

D Oil drain tap (tapped 1/2 in BSP)

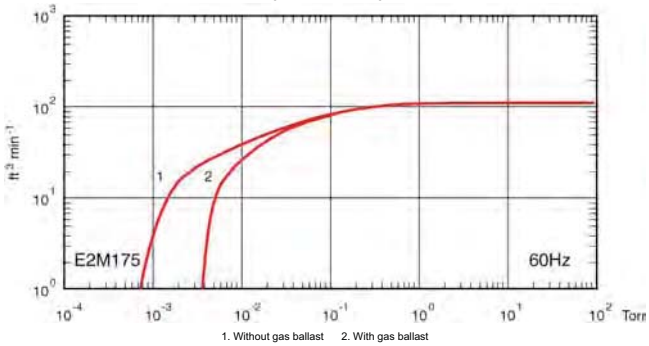
E Oil filter mounting plate (allow 330 mm to withdraw filter from pump)

F Oil pressure take-off (tapped 1/8 in BSP)

Performance Curves



1. Without gas ballast 2. With gas ballast



1. Without gas ballast 2. With gas ballast

Technical Data

Displacement	
50Hz	178 $m^3 h^{-1}$ / 105 $ft^3 min^{-1}$
60Hz	214 $m^3 h^{-1}$ / 126 $ft^3 min^{-1}$
Speed (Pneurop)	
50Hz	160 $m^3 h\text{-}1$ / 94 $ft^3 min^{-1}$
60Hz	196 $m^3 h\text{-}1$ / 115 $ft^3 min^{-1}$
Number of stages	2
Ultimate vacuum (total pressure)	
Without gas ballast	1.0×10^{-3} mbar / 7.7×10^{-4} Torr
With gas ballast	7.0×10^{-3} mbar / 5.4×10^{-3} Torr
Inlet connection	ISO63 blank flange with seal
Outlet connection	ISO40 flange centre tapped
Maximum outlet pressure	0.5 bar gauge
Maximum inlet pressure for water vapor	20 mbar / 15 Torr
Maximum water vapor pumping rate	0.3 kg h^{-1} / 0.7 lb h^{-1}
Weight	200 kg / 441 lb
Motor protection rating	IP44
Motor power	
50Hz	5.5 kW / 7.5 hp
60Hz	6.5 kW / 8.5 hp
Standard oil capacity	
maximum	25 liter / 26 qt
minimum	16 liter / 17 qt
PFPE oil capacity	
Maximum	18 liter / 19 qt
Minimum	6.5 liter / 6.9 qt
Recommended oil	Ultragrade 70
Noise level	75 dB (A)

Ordering Information

Product Description	Order No.
E2M175 220-240/380-415V, 3-ph, 50Hz	A36601935
E2M175 208-230/460V, 3-ph, 60Hz 4 pole	A36603982
E2M175T3 220-240/380-415V, 3-ph, 50Hz	A36618993
E2M175FX 220-240/380-415V, 3-ph, 50Hz	A36615935
E2M175FX 208-230/460V, 3-ph, 60Hz	A36616982
Accessories & Spares	**Order No.**
Spares Kit C&O E1M175/275S	A34601131
Spares Kit C&O E2M175/275	A36601131
Service Interior Assy E1M175	A34601100
Service Interior Assy E2M175	A36601100
Spares Kit Blade E2M175	A36601134
Spares Kit Blade Springless E1M175	A34601134
Spares Kit Major E1M175S	A34601831
Spares Kit Major Service E2M175	A36601831

E2M275 Two Stage Rotary Vacuum Pumps

Edwards E2M275 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.

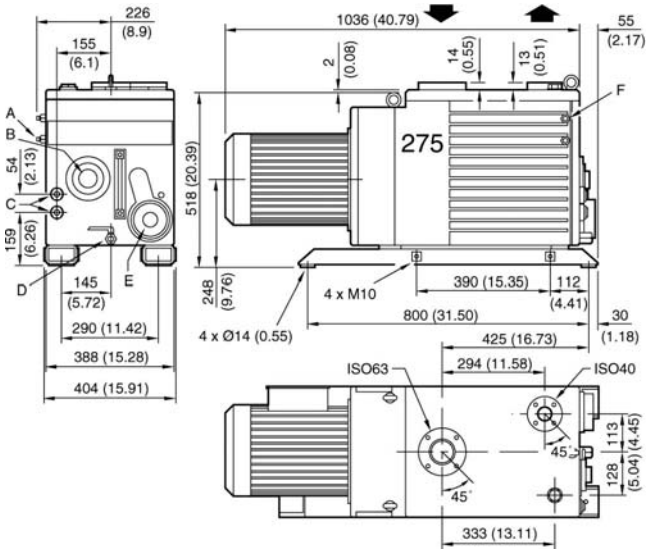
Features & Benefits

- Advanced pressurised oil circuit to give effective lubrication even under high gas loads
- When the pump is switched off, the spring loaded distributor valve provides oil and air suck-back protection
- Gas Ballast control to assist in handling high water vapour loads
- Industrial roller bearings on drive shaft for ultimate reliability and long, trouble free life
- Full height oil sight glass for easy checking of oil level and condition

Applications

- Vacuum metallurgy processes
- Thin film coating technologies
- Pharmaceutical freeze drying
- Refrigeration and air conditioning system evacuation, drying, and backfilling
- Transformer and cable drying and impregnation, insulating oil treatment plant

Dimensions



A Union for oil return connection from oil mist filter

B Gas ballast control valve

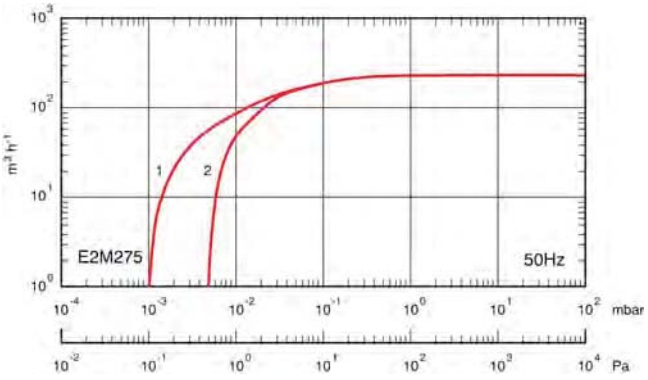
C Water connections (tapped 1/8 in BSP)

D Oil drain tap (tapped 1/2 in BSP)

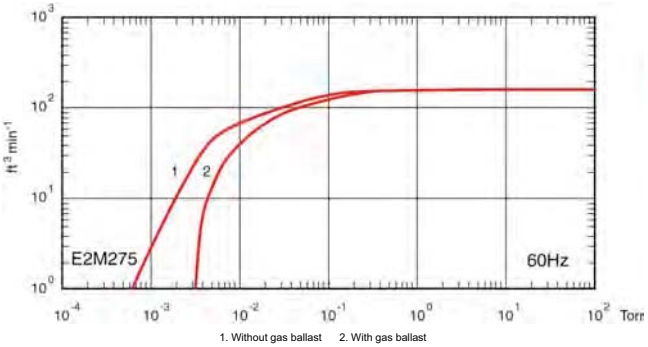
E Oil filter mounting plate (allow 330 mm to withdraw filter from pump)

F Oil pressure take-off (tapped 1/8 in BSP)

Performance Curves



1. Without gas ballast 2. With gas ballast



1. Without gas ballast 2. With gas ballast

Technical Data

Displacement	
50Hz	292 $m^3 h^{-1}$ / 172 $ft^3 min^{-1}$
60Hz	350 $m^3 h^{-1}$ / 206 $ft^3 min^{-1}$
Speed (Pneurop)	
50Hz	255 $m^3 h$-1 / 150 $ft^3 min^{-1}$
60Hz	306 $m^3 h$-1 / 180 $ft^3 min^{-1}$
Number of stages	2
Ultimate vacuum (total pressure)	
Without gas ballast	1.0×10^{-3} mbar / 7.7×10^{-4} Torr
With gas ballast	5.0×10^{-3} mbar / 3.8×10^{-3} Torr
Inlet connection	ISO63 blank flange with seal
Outlet connection	ISO40 flange centre tapped
Maximum outlet pressure	0.5 bar gauge
Maximum inlet pressure for water vapor	12 mbar / 9 Torr
Maximum water vapor pumping rate	2.3 kg h^{-1} / 5.1 lb h^{-1}
Weight	225 kg / 495 lb
Motor protection rating	IP44
Motor power	
50Hz	7.5 kW / 10 hp
60Hz	8.5 kW / 11 hp
Standard oil capacity	
maximum	28 liter / 29.5 qt
minimum	19 liter / 20 qt
PFPE oil capacity	
Maximum	18 liter / 19 qt
Minimum	7 liter / 7 qt
Recommended oil	Ultragrade 70
Noise level	75 dB (A)

Ordering Information

Product Description	Order No.
E2M275 220-240/380-415V, 3-ph, 50Hz	A36701935
E2M275 208-230/460V, 3-ph, 60Hz	A36703982
E2M275T3 400V, 3-ph, 50Hz	A36718993
Accessories & Spares	**Order No.**
Spares Kit C&O E1M175/275S	A34601131
Spares Kit C&O E2M175/275	A36601131
Service Interior Assy E1M275	A34701100
Service Interior Assy E2M275	A36701100
Spares Kit Blade E2M275	A36701134
Spares Kit Blade Springless E1M275	A34701134
Spares Kit Major E1M275S	A34701831
Spares Kit Major Service E2M275	A36701831

MF Outlet Mist Filters

The MF30, MF100 and MF300 mist filters are suitable for pumps from E2M28 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 vapors 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 centering ring and O-rings, bolts, washers, mounting brackets and studs

† 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 (E1M40 to E2M80)	A50004000
Clean application oil return kit (E1M175 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 vapors to the outside of the building.

There is always a risk that some vapor 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, 6.5 liter/6.2 qt capacity (12.0 kg/26.5 lb)*	A46103000
Model CP300 outlet catchpot, 23.0 liter/22 qt capacity (28.0 kg/62 lb)†	A46104000

* Supplied with two NW25 "C" clamps, NW25 elbow, two NW25 centering rings and O-rings, bolts, washers, mounting bracket and studs.

† Supplied with two ISO40 "C" clamps, ISO40 elbow, two 40 mm O-rings and centering rings, 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 liters / 5.7 qt (EOF100) and 15 liters / 14.3 qt (EOF300).

The EOF100A and EOF300A chemical filters have a renewable high-capacity, 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 E1M/E2M175 and 275 connection kit	
EOF300A	A50003000
EOF300M	A50023000
Connection kit for E1M/E2M40 and E1M/E2M80	
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

Pumped External Oil Filters

EOF filters have their own pump, which delivers 3.5 l min^{-1} / 0.89 US gal min^{-1} (50 Hz) clean, decontaminated oil to the pump oil system.

The canister is available in two sizes to suit the contaminant load.

The 25P and 40P elements filter dust contaminants from the oil. The 25C and 40C elements filter both dust and chemical contaminants. Both elements have a pleated paper filter to trap dust particles; the 25C and 40C elements have a bed of activated alumina for chemical adsorption.

Oil pump flow rate	3.5 l min^{-1} / 0.8 US gal min^{-1} (50 Hz)
Electrical supply	100-120 / 200-240 V, 1-ph, 50/60 Hz
Current	5 A (start), 2.5 A (run)
Dimensions	
Height	435 mm / 16.97 inch
Width	385 mm / 15.02 inch
Depth	320 mm / 12.49 inch
Weight (dry)	
Base units	22.5 kg / 50 lb
25 CR canister	2.8 kg / 6 lb
40 CR canister	4 kg / 9 lb

Please consult Edwards or your supplier for other technical data

Ordering Information

Product Description	Order No.
CR base module, PFPE prepared	A54011999
Supplied with hoses and 2 pairs of disconnects. When you order, specify a base module, canister, element and a pump connection kit separately.	
EOF canisters	
25CR	A54012022
40CR	A54014022
Spare elements	
40P	A22304068
25C	A22304090
40C	A22304091
Oil sampling valve	A50409000
Canister outlet pressure gauge	H01900013
Pump connection kits	
E1M/E2M40	A54000002
E1M/E2M80	A54000004
E1M/E2M175	On application
E1M/E2M275	On application

OPG Oil Pressure Gauges

Fit the OPG to the pump to allow visual indication of the oil pressure. This will provide early indication of a reduction in oil pressure so you can plan preventative maintenance. The 0 – 30 psig OPG gauges are buffered against pulses in the oil pressure, to give a steady reading. The OPG100HC is made of brass construction.

Ordering Information

Product Description	Order No.
OPG100HC brass oil pressure gauge	A50435000
Connection kit for fitting	On application

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 minimize 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.
E1M40/E2M40	.5	0.6 kg/1.3 lb	A24801405
E1M80/E2M80	2.5	0.6 kg/1.3 lb	A24801405
E1M175/E2M175	3	0.9 kg/2 lb	A24801406
E1M275/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 E1M/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 EBV valve (EBV20 for RVs and E2M1.5 to E2M28, EBV100S for E1M40 and 80, EBV300S for E1M175 and 275, 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 suck-back 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.
EBV20 (0.5 kg) 220 – 240 V s.ph 50/60 Hz	A50006930
EBV100S (0.5 kg) 220 – 240 V s.ph 50/60 Hz	A50018930
EBV300S (1.2 kg) 220 – 240 V s.ph 50/60 Hz	A50016930
EBV300D (1.0 kg) 220 – 240 V s.ph 50/60 Hz	A50017930

TCV300 Temperature Control Valve

Use the TCV300 with the E1M/E2M175 and 275 pumps. The valve facilitates rapid pump warm-up and higher operation temperatures. This improves the pump's vapor 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 aluminum 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 centering 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 aluminum 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 centering 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

ITP800 Dust & Particulate Trap

The ITP800 dust and particulate trap is intended for use in processes where large quantities of dust and particulates will block conventional filters in a matter of hours or days. Although primarily intended for Semicon applications such as SACVD, BPSG and some PECVD processes, the ITP800 is also suitable for high-dust industrial processes.

Constructed from a series of concentric fine mesh cylinders, the ITP800 provides an unrestricted gas flow, but presents a large surface area onto which dust is collected.

The ITP800 has a complete self-contained filter element in a canister which is quick, safe and easy to remove and replace, thus reducing downtime. Contaminants are contained within the canister, reducing the risk of spillage at the pump.

Ordering Information

Product Description	Order No.
ITP800 dust & particulate trap complete	A44504000
Weight 22 kg/48 lb	

Spares	Order No.
C100 self contained filter element – spare	A44106700

ITO Inlet Catchpots

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

- Capture condensable vapors
- 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 liters/5.2 qt capacity (6.8 kg, 15 lb)*	A44102000
ITO300 inlet catchpot, 7.87 liters/7.5 qt capacity (8.0 kg/18 lb)†	A44103000
IT0800 inlet catchpot, 9.5 liters/10 qt capacity (19.5 kg/43 lb)**	A44104000

* Supplied with bolts, washers, 40 mm O-ring and centering 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 vapors, which may attack the pump or pump oil
- Prevent high molecular weight vapors (such as might arise in a resin treatment plant), from reaching the pump. These vapors 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 vapor 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*	A44402000
Charcoal charge 0.75 kg/1.7 lb, weight 16.5 kg/1.7 lb	
ITC300 inlet chemical trap†	A44403000
Charcoal charge 1.1 kg/2.4 lb, weight 9 kg/20 lb	
ITC800 inlet chemical trap**	A44404000
Charcoal charge 3.3 kg/2.4 lb, weight 21 kg/20 lb	

* Supplied with bolts, washers, 40 mm O-ring and centering 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

Ordering Information – All Territories Except North America