

# EOSi OIL-SEALED SCREW VACUUM PUMPS WITH EJGO CONTROLLER

EOS350-5400i



## EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps for industrial applications with over 100 years' history.

We believe in delivering results that bring value to our customers. Using our breadth of industry experience, we identify and apply effective solutions. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design that gives the maximum performance in the most reliable and cost-effective way.

## INNOVATION AND INTELLIGENCE

EOS350-5400i range of oil-sealed rotary screw vacuum pumps are efficient, quiet and are equipped with Edwards' new generation intelligent controller - EJGO. As ever at the forefront of technology with Variable Speed Drive (VSD), the EOSi range delivers impressive on-demand performance capacity and optimises energy consumption. EJGO brings cutting-edge control and connectivity to optimise and monitor EOSi operations.



### Increased efficiency

Plug and play screw technology for easy installation Variable Speed Drive (VSD) and innovative motor design



### Reduced environmental impact

Ultra-high oil retention at all operating pressures



### Improved productivity

Class-leading pumping speed and fast chamber pump-down performance capability



### Small footprint

Reduces space used in utility room or production floor



### Intelligent control

Closed loop pressure control and active power management



### Quiet operation

Low noise levels for a safer working environment



### Low cost of ownership

Automatic performance matched to vacuum demand



### Improved maintenance

The highly efficient oil separator design extends service intervals and reduces maintenance cost



### Versatility and flexibility

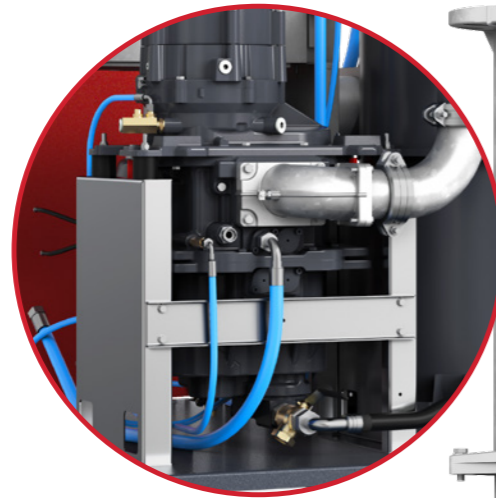
Temperature management control enables superior water handling capability. Various configurations are available to meet the needs of your applications



# NEW GENERATION EOS1400-2000i - WITH VERTICAL DRIVE CHAIN, SMALLER FOOTPRINT AND EJGO INTELLIGENT CONTROL

## PUMP MODULE

- ▶ Highly efficient oil-sealed rotary screw
- ▶ Robust design
- ▶ Longer element life due to robust design



## INLET FILTER AND CONTROL VALVE

- ▶ Inlet filter inside the machine provides protection with 99%+ removal efficiency standard to 5 microns
- ▶ Control valve isolation with the customer system provides vacuum control



## GUARANTEED OIL RETENTION

- ▶ Optimal design for maximum oil retention
- ▶ Longer life because of managed performance means the vacuum pump never overloads the separators
- ▶ Minimal oil carryover from overloaded oil separators as compared to conventional fixed speed vacuum pumps



## EASY TO USE, SIMPLE TO MAINTAIN

- ▶ It slips the cover to the side, allowing the oil separator filter to be changed easily and quickly
- ▶ A clever design, including a drip leg in the exhaust pipe enables the condensates to be collected in the discharge pipework at the outlet
- ▶ Standard outlet connection for a plug and play solution

## EJGO - INTELLIGENT CONTROL SYSTEM

EJGO is a control and monitoring system for your vacuum pumps. It is easy-to-use, and offers comprehensive control for your vacuum installation, leading to energy savings.

It can also integrate with your plant management system and connect to network thanks to the flexible connectivity that support fieldbus communication and network protocols



# EOSi: OPTIMISED TO MATCH YOUR APPLICATION

The EOSi range features a variety of options - air-cooled and water-cooled, Standard, Q, W or QW to enable you to select the optimal choice for your application.



## Standard

This pump is designed to deliver the exact performance to match your demand, at the minimum possible lifecycle cost. With the intelligent control you can potentially save 50%\* or more energy compared with conventional solutions.



## W

Whilst the standard EOSi pumps are able to reliably pump water vapour loads similar to equivalent rotary vane pumps, the W version is designed to pump significantly higher water vapour loads and can offer superior comparative performance where required on applications such as pipeline drying and freeze-drying.



## Q EOS 350-900

The Q version is designed for cycling applications, where chamber pump-down time is important. The responsive inverter control and special software enables even faster chamber pump-down with optimal energy efficiency.



## QW

The QW version combines the special design of the Q version with the water vapour handling capabilities of the W version.

## KEY OPTIONS AND RETROFIT KITS

- ▶ Best fit to every need
- ▶ Make retrofits possible to meet the application changes

- **Quick pump-down version**

Faster pump-down time

- **Relative pressure control**

Setup for inlet pressure setpoint control relatively compared to actual atmospheric pressure

- **Wet version retrofit**

High water handling capacity

- **High ambient version**

Up to 50 °C ambient temperature  
(Available for EOS1400-2000i)

- **Energy recovery retrofit**

Available for EOS1400-2000i and EOS3800-5400i

Recover up to 80% of this heat

- **Overboost function**

Allows to increase the flow below 200 mbar(a) during a short period

Boost the performance for cycling application

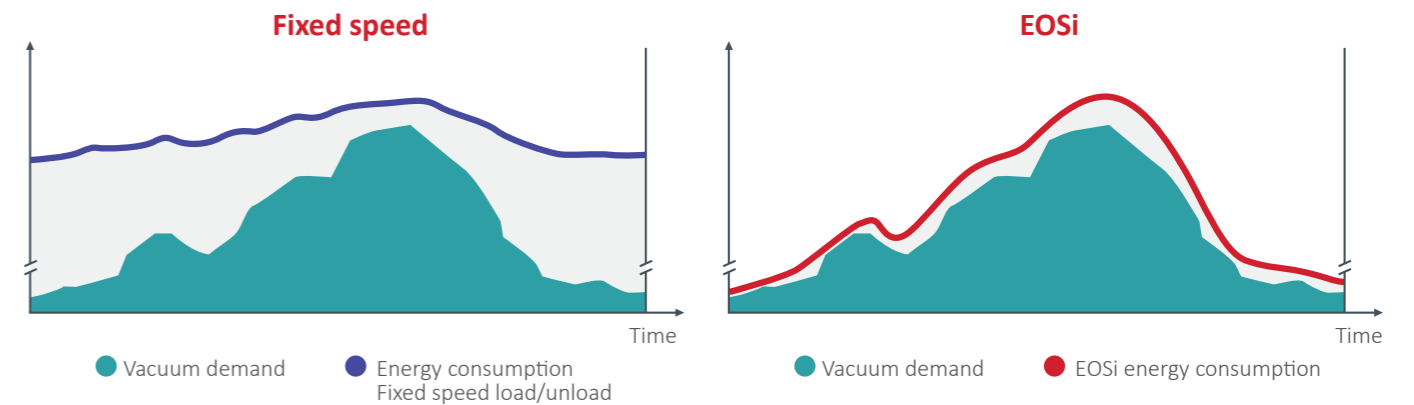
- **Booster control**

Controls the added booster

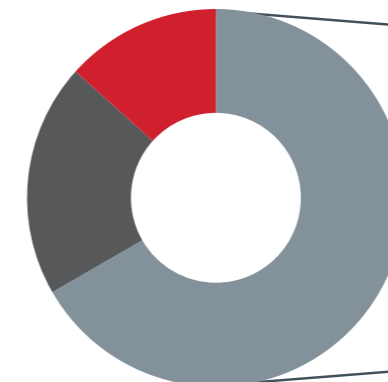
# EOSi: DESIGNED TO DELIVER ENERGY SAVINGS

With intelligent controller EJGO and the high efficiency inverter, the EOSi can maintain a set point pressure during process and adjust its speed to meet the demand at that setpoint. With an extensive flow range (10%-100%), potential energy saving of 50% or more can be achieved using EOSi technology compared with conventional technology.

We've designed the pump to limit the motor speed when the process starts. This helps reduce the power consumption required to kick-start the process. EOSi has a smaller motor size compared to a fixed speed machine. Eliminating peak current also benefits the electrical installation (cable and fuse size). In most product environments, a vacuum system is not required to perform to its fullest for the entire time – whether that is during a process cycle, during a pump-down cycle or during machine idling time. The intelligent EOSi delivers peak performance only when required, thereby ensuring significant energy savings and lower maintenance cost.



## Fixed Speed Vacuum Pump



**50%\***  
SAVINGS

## EOSi



Legend: Energy (grey), Maintenance (red), Investment (black)

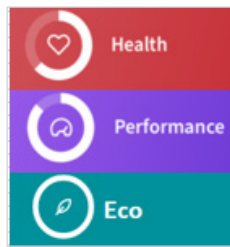
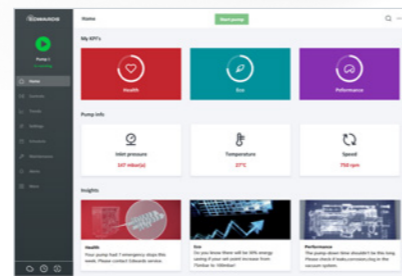
\*In most applications compared to traditional fixed speed vacuum technologies based on measurement with our Vbox energy audit tool.

# EJGO INTELLIGENT CONTROLLER

EJGO is Edwards' new generation controller which takes vacuum control to the next level.

## USER-FRIENDLY INTERFACE

- ▶ Front panel
  - Clear and ease of use
  - Basic and reliable
- ▶ 7" HMI
  - Graphic design and configurable homepage
  - Completed onboard control
- ▶ Web browser (PC, tablet, mobile)
  - Monitor and take control from any connected device
  - Remote control possible when the pump is connected to network or cloud

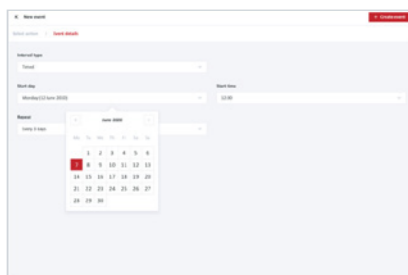


## KPI INSIGHT AND MANAGEMENT

- ▶ Assess your pump health, vacuum performance and operating economy
- ▶ KPI score and insight cards give deep understanding of the systems beyond on/off and pressure setpoint

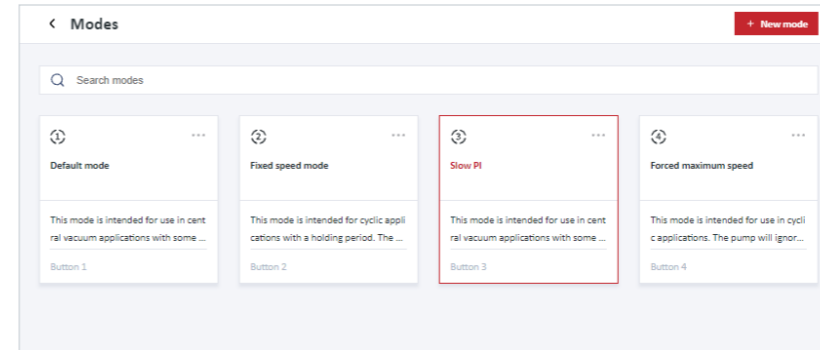
## TREND MAP FOR DATA MONITORING

- ▶ Monitor pump operation continuously and get all the information for everyday management
- ▶ Graphic curve of pump parameters including Inlet Pressure, Motor Speed, Power Consumption, Outlet Temperature and more. (Day, week, month)
- ▶ In-depth examination of data and comparison of multiple metrics/cycles



## INTELLIGENT SCHEDULING

- ▶ Plan a series of events into calendar, not limited to pump start/stop, purge cycle and auto clean
- ▶ Easily set up actions that repeat continually to fit the process



## OPERATING MODE MANAGEMENT

- ▶ Default and other setting modes to fit different applications. E.g., forced maximum speed mode, fixed speed mode to get pump down optimisation
- ▶ Customise operation modes according to process requirement



## NOTIFICATION AND AUTOMATIC UPDATE

- ▶ Safety: warning, fault, and shutdown indications and screen view
- ▶ Cloud access allow email notification in case of pump failure
- ▶ Automatic software update



## SECURITY

- ▶ TPM2 chip and ECC certificate used on the controller
- ▶ Operation system and application software is signed and encrypted
- ▶ Partitioned memory to protect sensitive data
- ▶ Different levels set-up and user authentication required for identity management



Ethernet cable



WiFi bolt fitted



GENIUS box

## CONNECTIVITY AND FIELD BUS COMMUNICATION

- ▶ Various options for network connection. E.g., stand alone, internal enterprise network only or fully connected to cloud
- ▶ Support all Ethernet-based protocols and connect directly even without gateway



- ▶ Gateway as options to enable communication with the other protocols



# EOS350-5400i RANGE OF OIL-SEALED ROTARY SCREW VACUUM PUMPS



EOS350i  
EOS585i  
EOS730i  
EOS900i



EOS1400i  
EOS1700i  
EOS2000i



EOS3800i  
EOS4600i  
EOS5400i

## EOS350-900i

Oil-sealed screw pumps range at 350m<sup>3</sup>/hr to 900m<sup>3</sup>/hr capacity with Variable Speed Drive (VSD) technology and EJGO intelligent control. The EJGO controller offers more derating functions to increase the pump uptime including current speed derating, outlet temperature derating, outlet pressure derating, and weak grid derating.

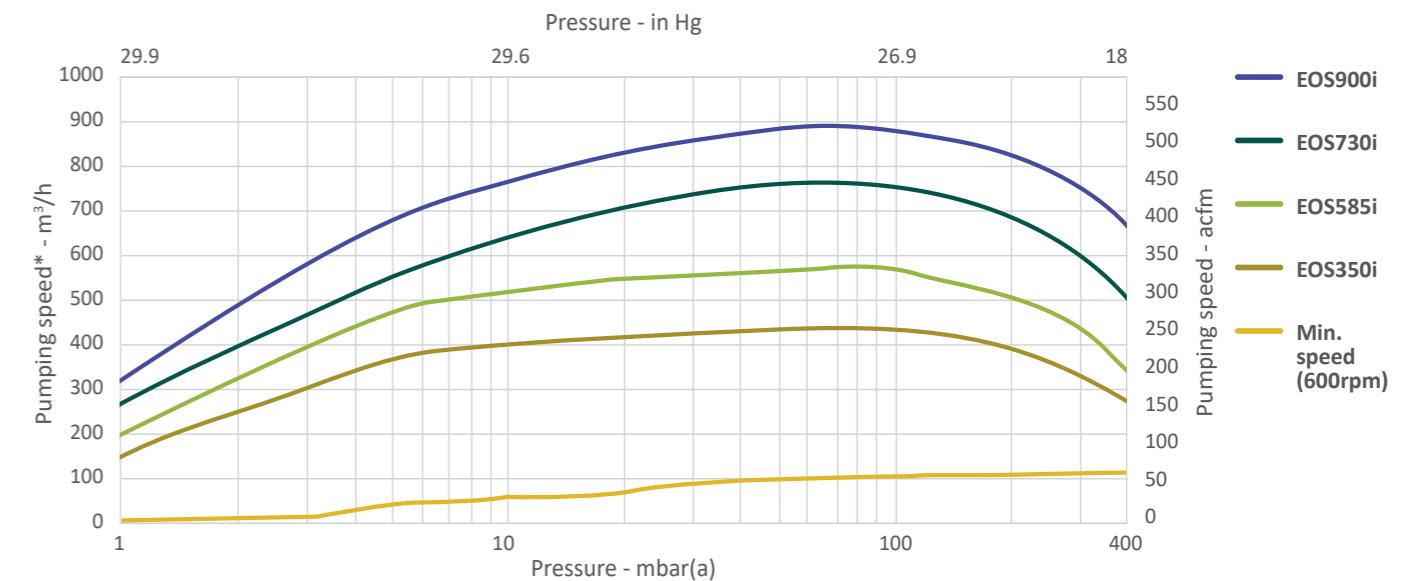


### TECHNICAL SPECIFICATION

	Units	EOS350i	EOS585i	EOS730i	EOS900i
Nominal displacement	m <sup>3</sup> /h / cfm	400 / 240	560 / 330	730 / 430	900 / 530
Ultimate vacuum	mbar / torr	0.35 / 0.26	0.35 / 0.26	0.35 / 0.26	0.35 / 0.26
Frequency range	Hz	20-116	20-150	29-200	20-233
Inlet connection	-	DN 80	DN 80	DN 80	DN 80
Outlet connection	-	DN 60	DN 60	DN 60	DN 60
Shaft power	kW	5.5	7.5	11	15
Permissible ambient temperature	°C	0-46	0-46	0-46	0-46
Noise level range	dB(A)	51-65	51-68	51-73	51-76
Oil quantity	L	16	16	16	16
Dimensions (L x W x H)	mm	1266 x 934 x 1083	1266 x 934 x 1083	1266 x 934 x 1083	1266 x 934 x 1083
Weight	kg	495	500	510	520
Electrical specification	380-460V 50Hz/60Hz CSA/UL				

Air-cooled and water-cooled versions are available for models.

### PERFORMANCE CURVE



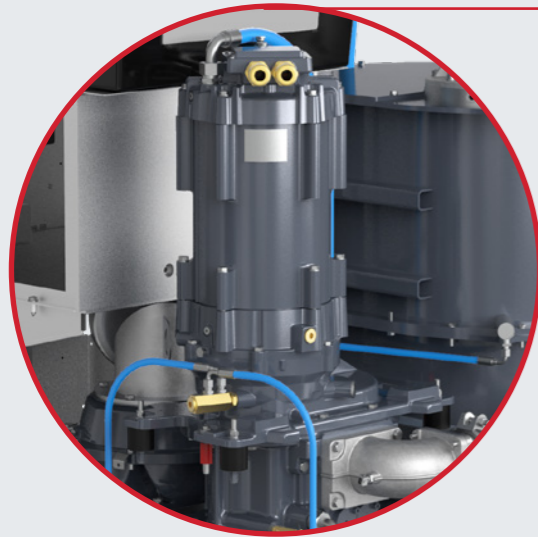
\*Pumping speed at element inlet at steady state- according ISO 21360-1:2012 (E).

# EOS1400-2000i

The new generation oil-sealed screw vacuum pumps. An innovation which brings together an efficient new element and IE5 Permanent magnet motor, provides a significant enhanced performance. And the new EJGO controller takes the pump to a new level of intelligence.

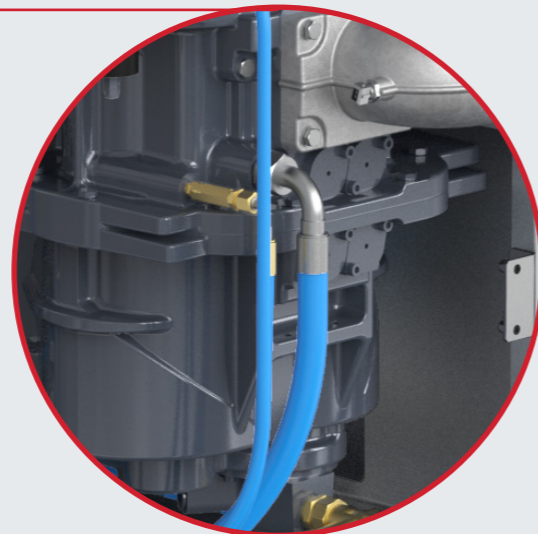


## NEW GENERATION



### PERMANENT MAGNET ASSISTED SYNCHRONOUS RELUCTANCE MOTOR

- ▶ The ultra-premium efficiency – IE5
- ▶ Efficient at all the speeds to minimise energy loss
- ▶ Optimal cooling by oil of the pump without the need for an extra fan, resulting in less power consumption and less noise
- ▶ Oil lubricated bearing, no re-greasing needed, leading to reduced maintenance
- ▶ IP66 design - total protection from dust



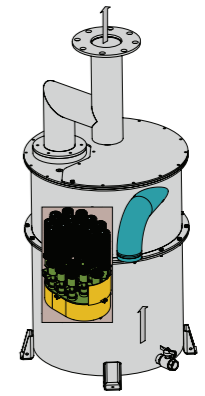
### OPTIMAL PERFORMANCE SCREW ELEMENT

- ▶ Innovative screw profile improves pumping performance
- ▶ 4 blow-off valves to allow increased pumping speed at high pressures with lowest power consumption
- ▶ Extend overhaul interval to 1000 hours for normal applications

## EXCELLENT OIL RETENTION

### ▶ Excellent oil retention

- Optimal oil separation, thanks to the design and multiple OSE (Oil Separator Element)
- Booster control
- Optimal exhausted air quality and environment friendly
- Low back pressure for lower power consumption
- OSE can be changed without disassembling the exhaust piping



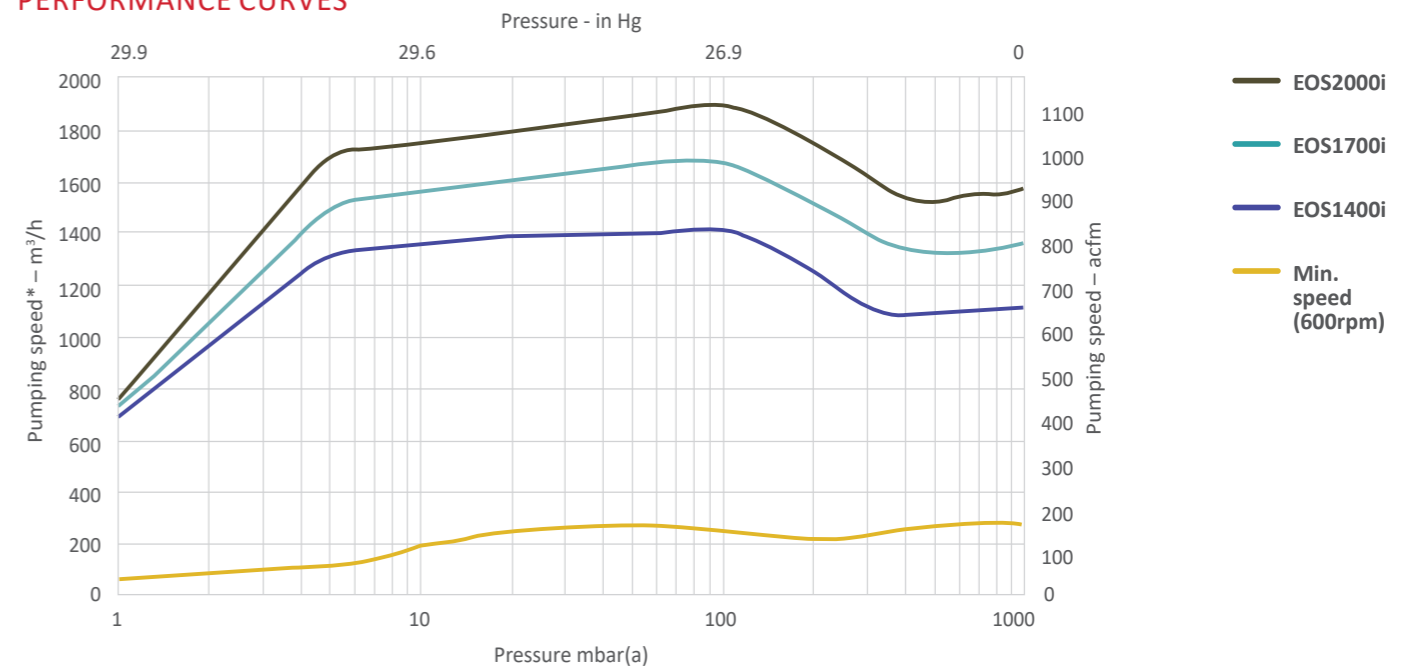
Centrifugal and gravitational effect in oil separator

## TECHNICAL SPECIFICATION

	Units	EOS1400i	EOS1700i	EOS2000i
Nominal displacement	m <sup>3</sup> /h / cfm	1400 / 824	1620 / 953	1818 / 1070
Ultimate vacuum	mbar / torr	0.35 / 0.26	0.35 / 0.26	0.35 / 0.26
Frequency range	Hz	20-166	20-200	20-233
Inlet connection	-	DN150	DN150	DN150
Outlet connection	-	DN150	DN150	DN150
Shaft power	kW	22	30	37
Permissible ambient temperature	°C	0-46	0-46	0-46
Noise level range	dB(A)	55-74	58-77	58-78
Oil quantity	L	45	45	45
Dimensions (L x W x H)	mm	1460 x 1361 x 1665	1460 x 1361 x 1665	1460 x 1361 x 1665
Weight	kg	1050	1060	1070
Electrical specification	380-460V 50Hz/60Hz CSA/UL			

Air-cooled available for all the machines.

## PERFORMANCE CURVES



\*Pumping speed at element inlet at steady state- according ISO 21360-1:2012 (E).

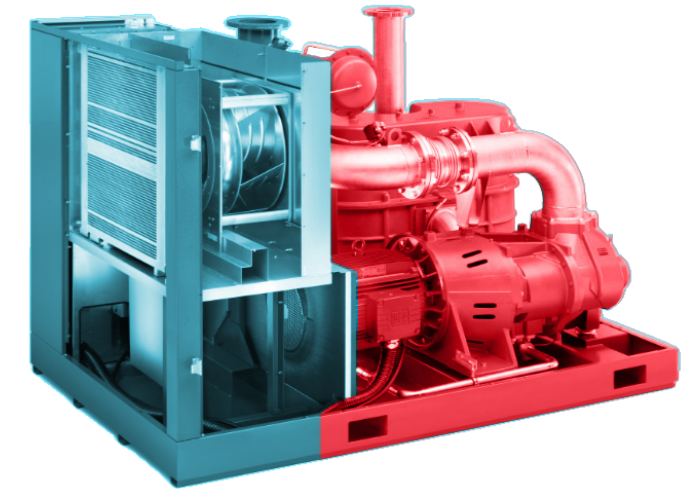
# EOS3800-5400i

Optimised temperature control with Quarter Mixing Valve combined with a VSD fan for the air-cooled versions which allow to control electronically the temperature of the pump with high accuracy and additional energy savings.



# ENCLOSURE WITH HOT-COOL ZONES

The EOS3800-5400i range features an enclosure with a hot-cool design. It isolates all heat producing and temperature critical components (oil separator and element) from all other components. As cool running means higher reliability, this feature extends the lifetime of electronic components and leads to a longer Mean Time Between Maintenance (MTBM).

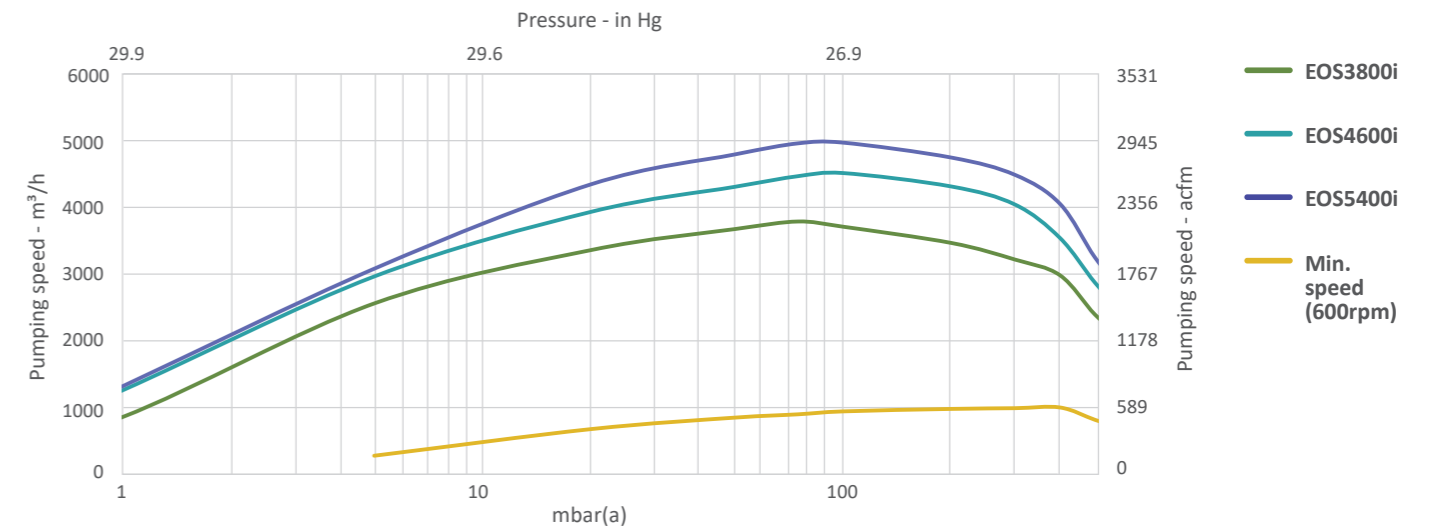


## TECHNICAL SPECIFICATION

	Units	EOS3800i	EOS4600i	EOS5400i
Nominal displacement	m <sup>3</sup> /h / cfm	3828 / 2253	4478 / 2636	5004 / 2945
Ultimate vacuum	mbar / torr	0.35 / 0.26	0.35 / 0.26	0.35 / 0.26
Frequency range	Hz	25-97	25-117	25-133
Inlet connection	-	DN200( PN10)	DN200( PN10)	DN200( PN10)
Outlet connection	-	DN150( PN10)	DN150( PN10)	DN150( PN10)
Shaft power	kW	55	75	90
Ambient temperature	°C	0-46	0-46	0-46
Noise level range	dB(A)	83 (+/-3)	84 (+/-3)	85 (+/-3)
Oil quantity	L	85	85	85
Dimensions (L x W x H)	mm	2850 x 1939 x 1893	2850 x 1939 x 1893	2850 x 1939 x 1893
Weight	kg	3945	3980	4000
Electrical specification	380-460V,3ph, 50Hz/60Hz, CSA/UL			

Air-cooled and water-cooled versions are available for all the machines.

## PERFORMANCE CURVE



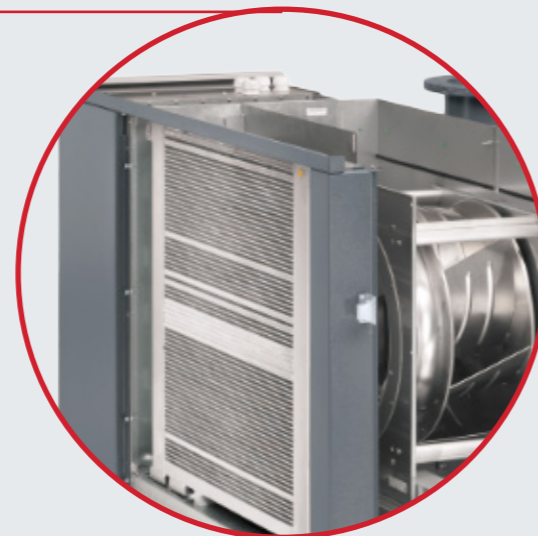
## QUARTER MIXING VALVE (QMV)

- ▶ Electronically controlled pump temperature
- ▶ Temperature sensor in the pump inlet for the QMV algorithm
- ▶ Optimised temperature control with high accuracy
- ▶ Contributes to efficient water handling capability



## CENTRIFUGAL VSD FAN

- ▶ Variable Speed Drive (VSD) controlled
- ▶ With oil temperature algorithm to allow on-demand cooling
- ▶ Additional energy savings
- ▶ More durable and resistant to harsh environments

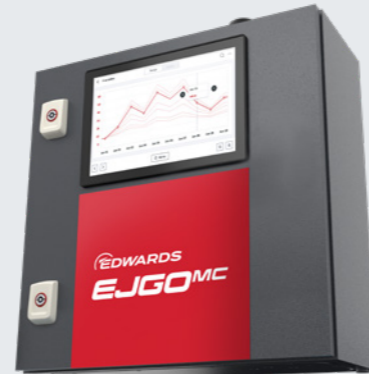


# CENTRAL VIEW OF EVERYTHING

Edwards' revolutionary central controller allows you to monitor and control multiple EOSi vacuum pumps simultaneously. Two EJGO MC models are available in standard and premium versions tailored to applications as needed.



Without screen - Web access supported



With 10" touch HMI - Onboard control

## SOFTWARE OPTIONS, TAILORED TO YOUR APPLICATION

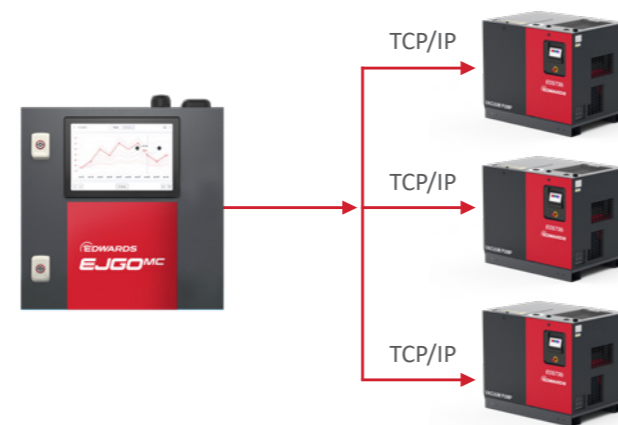
### Standard version

- ▶ Up to 8 Variable Speed Drive (VSD) or Fixed Speed (FS) pumps
- ▶ ~10% energy saving vs traditional sequencer

### Premium version

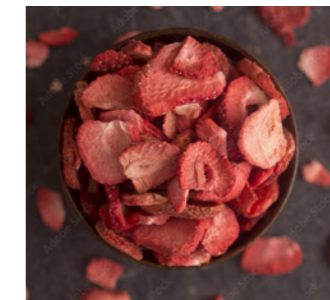
- ▶ Up to 20 Variable Speed Drive (VSD) or Fixed Speed (FS) pumps
- ▶ Innovative algorithm to maximise energy saving
- ▶ ~20% energy saving vs traditional sequencer

## CENTRAL VACUUM SYSTEM



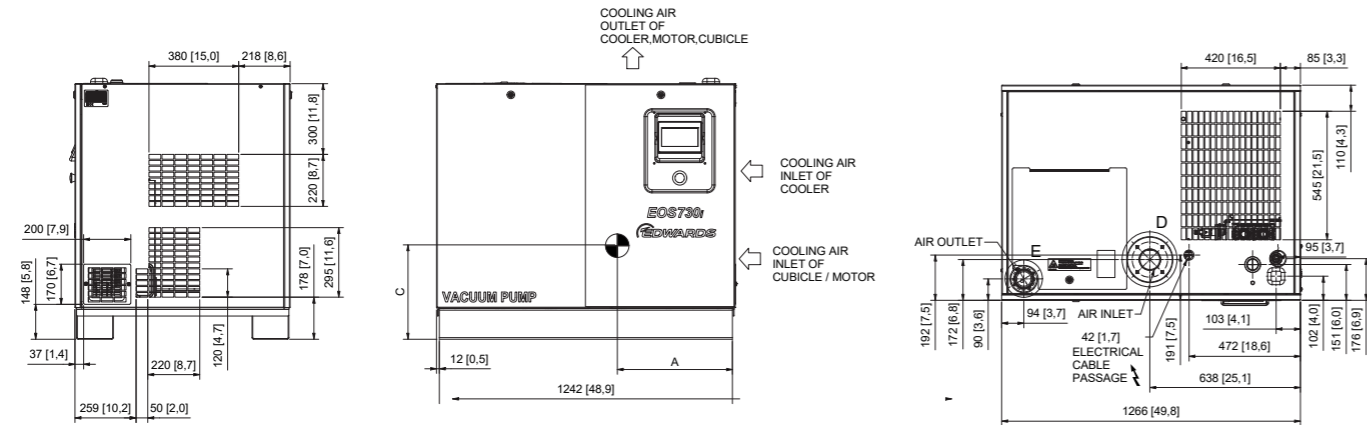
# APPLICATIONS

- ▶ Holding and lifting
  - Pick and place (e.g., electronics, flat-panel display, automotive glass)
  - Paper conveying (e.g., envelope manufacture, printing)
  - General packaging
  - Load lock (e.g., CNC/machining, woodworking)
- ▶ Forming and shaping
  - Plastic (e.g., bathtubs, shower trays, white goods internals, extrusion)
  - Thermoplastic packaging
  - Glass bottle
  - Lamination
- ▶ Food processing and preserving
  - Meat and poultry packaging (e.g., flat, vacuum packs, controlled/modified atmosphere packing)
  - Freeze drying
  - Canning
- ▶ General industrial application
  - Furnaces – Heat Treatment and Metallurgy
  - Altitude simulation
  - Coating
  - Pneumatic conveying
  - General evacuation duties
- ▶ Wet application
  - Food cooling
  - Ceramic tile and brick degassing
  - Pipeline drying

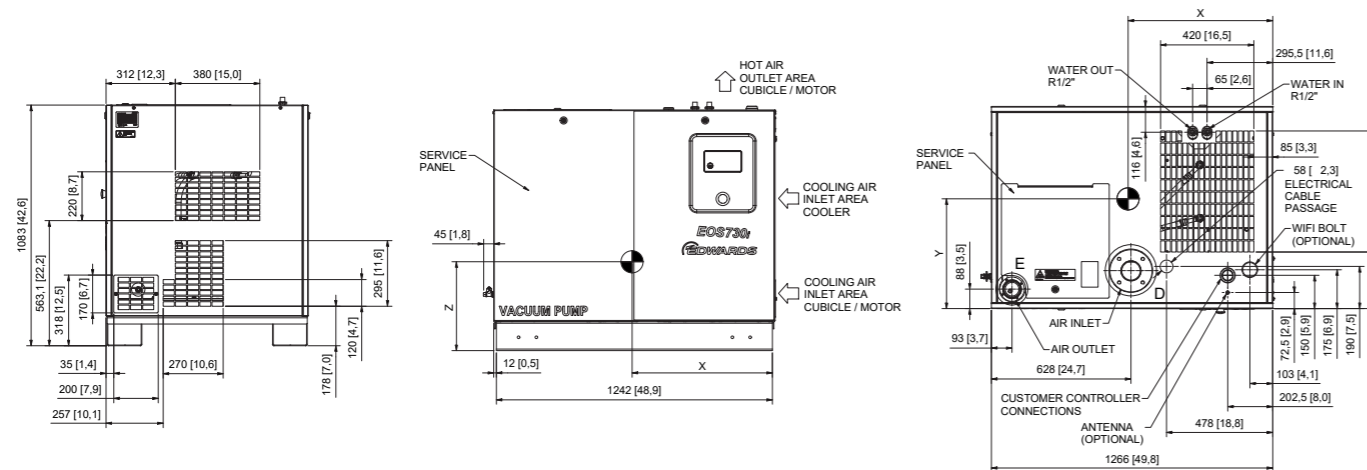


# DIMENSIONS

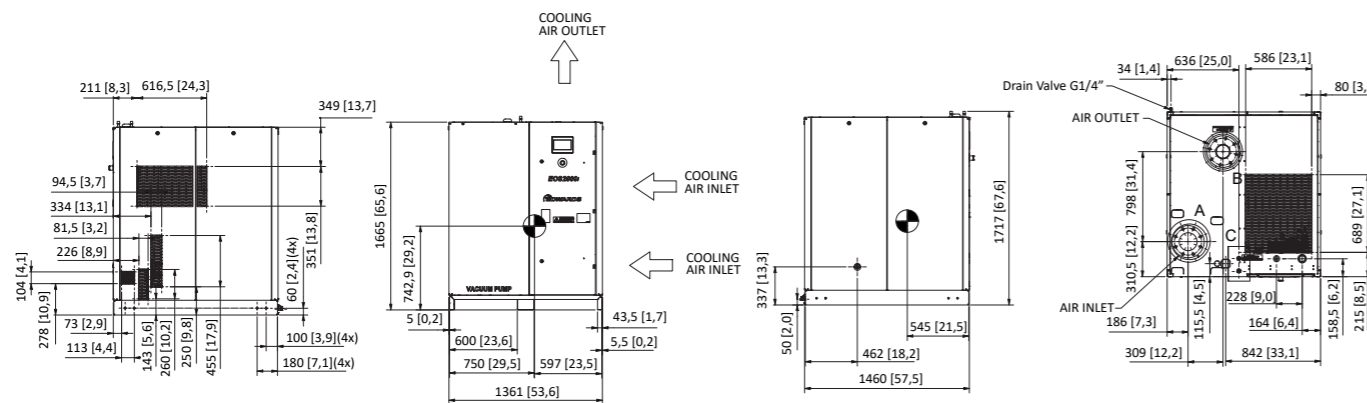
## EOS350-900i (7" HMI)



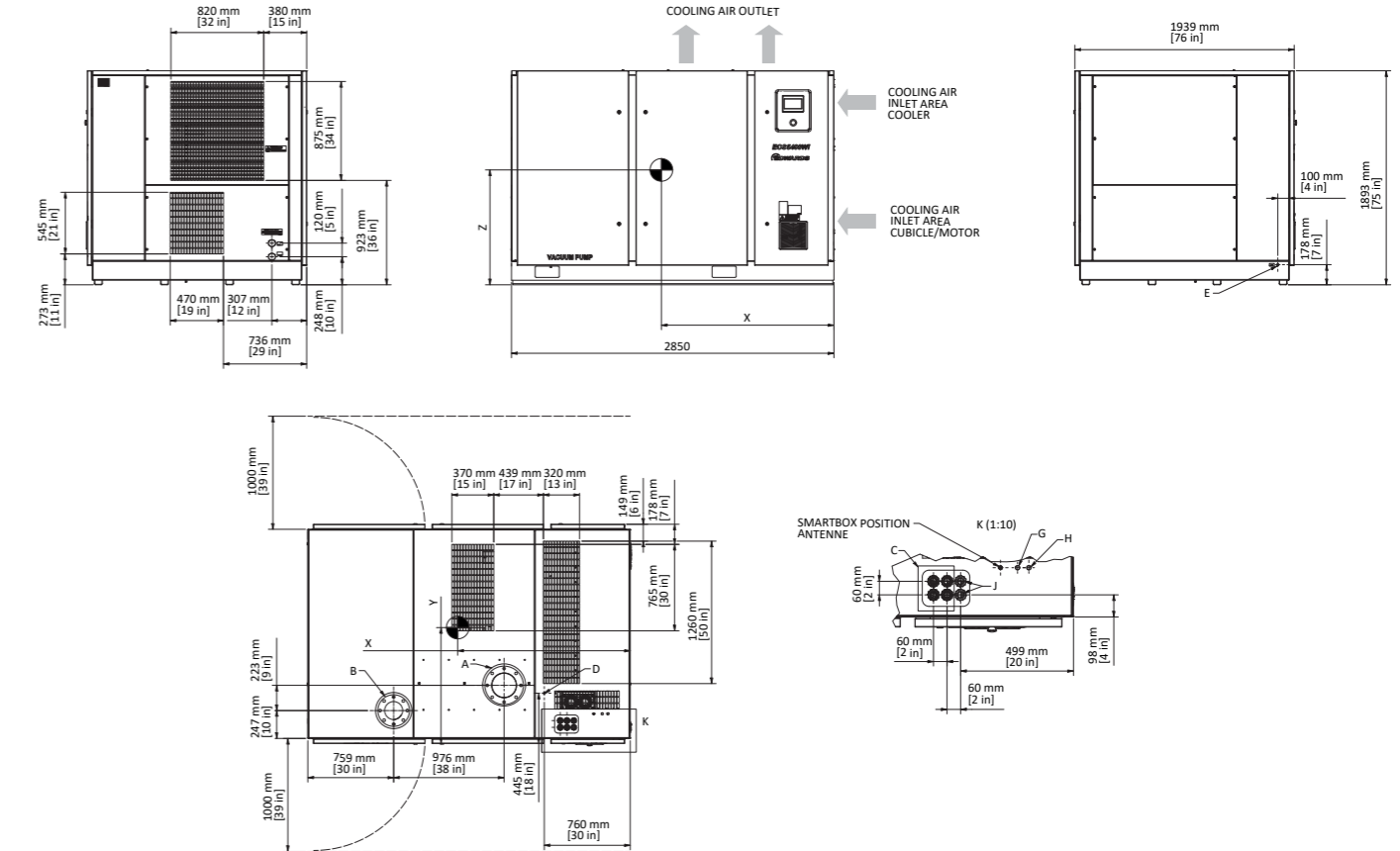
## EOS350-900i (Front Panel)



## EOS1400-2000i (7\"/>



## EOS3800-5400i (7\"/>



# SERVICE AND SUPPORT

Maintaining your EOSi vacuum pump is simple. Energy efficiency control means that the service interval stands extended. Should you forget, service intervals can be monitored briefly in the intuitively integrated EJGO interface. Optimum performance ensures maximum lifetime of the vacuum pump. And you can get notified when service is due. Intelligent design makes the EOSi range incredibly easy to access and work on. Further, it shortens the time taken to complete inspections and common tasks.

Frequent attention to the service requirements of your system greatly increases the period between major overhauls. This ensures clean and efficient operation. To maintain the best possible performance of your EOSi system, we recommend original Edwards parts. To support this, a comprehensive range of spares and lubricants is available.

**Contact your local Edwards sales office to discuss your specific requirements.**





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