

# Semiconductor Pumps



iXL Dry Pumps	238
EPX on-tool High Vacuum Pumps	240
GX Dry Pumps	256

# iXL120 Dry Pump System



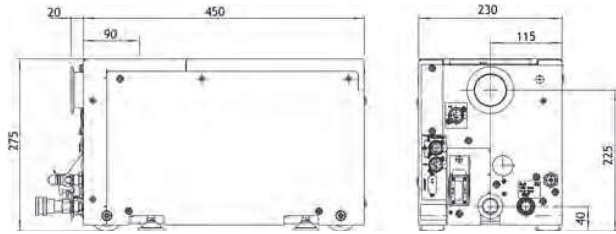
iXL120 is a compact, low energy, 110 m<sup>3</sup>/h dry pump for wafer handling and other clean duty applications. It provides fast pump down of load lock chambers with extremely low energy consumption.

iXL120 is one of the smallest and lightest pumps available for load lock and clean applications. Its low vibration and low noise levels make it ideal for mounting on-tool or within a fab's waffle floor, helping to save valuable fab floor space. A Green Mode allows reduced utilities usage during idle periods, lowering utility costs and helping to save the environment!

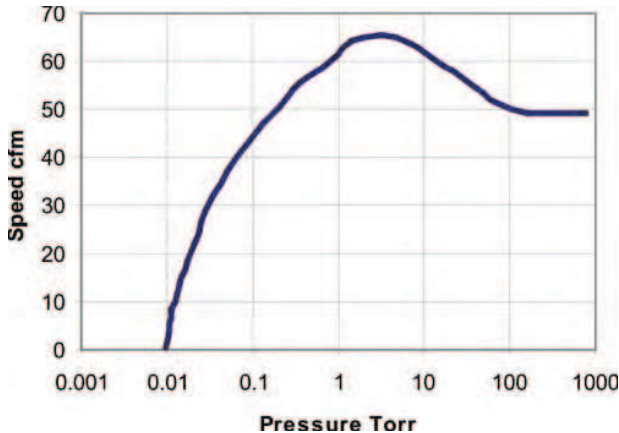
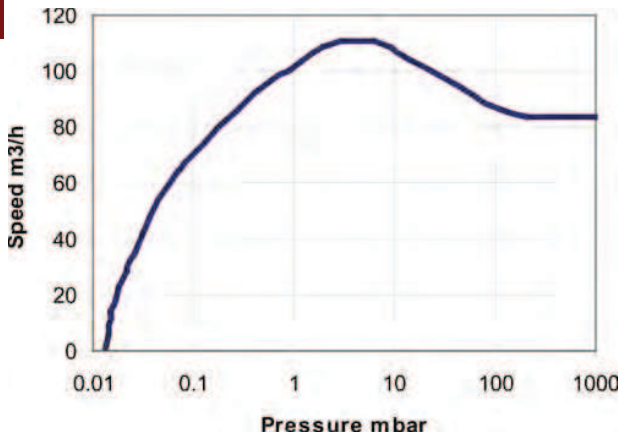
## Features & Benefits

- Class leading chamber pump down time reduces total average cycle time (TACT)
- Only 0.55kW power consumption helps minimise customer cost of ownership
- Green Mode can reduce power consumption by up to 92% during idle periods
- Up to 35°C water supply helps reduce facility cooling water requirements
- Extremely small and light, helping to save valuable fab space

## Dimensions



## Performance Curves



## Ordering Information

Product Description	Order No.
iXL120 E 200-460V 3/8 QC Water Fittings	A54113010
iXL120 E 200-460V 1/4 QC Water Fittings	A54113020
iXL120 E 200-460V HIT 3/8 QC Water Fittings	A54113610
iXL120 E 200-460V MCM 3/8 QC Water Fittings	A54113710
iXL120N E 200-460V 3/8 QC Water Fittings	A54114010
iXL120N E 200-460V 1/4 QC Water Fittings	A54114020
iXL120N E 200-460V SPI TIM 3/8 QC Water Fittings	A54114210
iXL120N E 200-460V TEL 3/8 QC Water Fittings	A54114410
iXL120N E 200-460V 3/8 QC Water Fittings Flow Cont Valve	A54114011
iXL120N E 200-460V TEL 3/8 QC Water Fittings Flow Cont Valve	A54114411
iXL120 E 200-460V 3/8 QC Water Fittings Flow Cont Valve	A54113011
iXL120 E 200-460V SPI 1/4 QC Water Fittings Flow Cont Valve	A54113221
iXL120 E 200-460V HIT 3/8 QC Water Fittings Flow Cont Valve	A54113611
iXL120 E 200-460V MCM 3/8 QC Water Fittings Flow Cont Valve	A54113711

## Technical Data

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Product	iXL120
Peak speed	110 m <sup>3</sup> /h /65 cfm /1833 l/min
Ultimate pressure (typical)	0.013 mbar /0.009 Torr /1.3 Pa
Power at ultimate	0.55 kW
Power in Green Mode	0.045 kW
Inlet connection	
Vertical	ISO63
Horizontal	NW50
Outlet connection	NW25
Cooling water connection	Optional
Water flow	1 l/m
Weight	59 kg

# EPX180L Dry pump



The new compact EPX180 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX180 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX180 offers outstanding performance in a package that is 20 lighter, 30 smaller and requires 40 less power than the IPX.

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

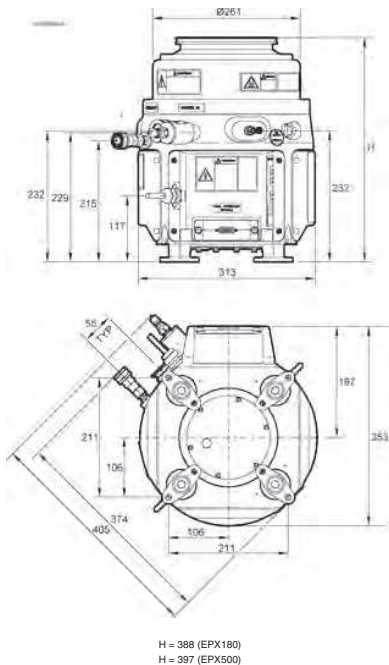
The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

The EPX 'L' Series has been designed for use clean duty applications pumping inert gas mixtures, such as loadlock, whereby control is provided by the process tool interface.

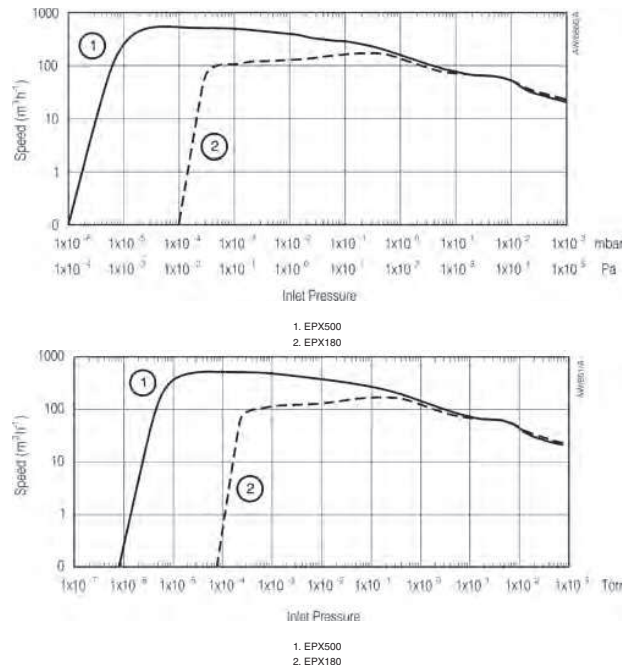
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Page  
240

## Dimensions



## Performance Curves



## Technical Data

Peak speed	170 m <sup>3</sup> h <sup>-1</sup> 105 ft <sup>3</sup> min <sup>-1</sup> 2835 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-4</sup> mbar <7.5 x 10 <sup>-5</sup> Torr <1 x 10 <sup>-2</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO63
Outlet flange	NW25
Noise	<59 dB(A)
Water connectors	3/8 in Quick
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	C3
Weight	43.5 kg

## Ordering Information

Product Description	Order No.
EPX180L Dry pump 400V, 3/8 Quick connects	A41941014
EPX180L Dry pump 208V C3 TIM 9/16 water connector	A41941132
EPX180L Dry pump 208V SPI TIM 3/8 water connector	A41941212
EPX180L Dry pump 208V SPI TIM 1/4 water connector	A41941222
EPX180L Dry pump 208V E73 TIM 3/8 water connector	A41941312
EPX180L Dry Pump 400V E73 TIM 3/8 water connectors	A41941314
EPX180L Dry pump 208V TEL TIM 3/8 water connector	A41941412
EPX180L Dry Pump 400V LAM TIM 3/8 water connectors	A41941514
EPX180L Dry Pump 208V MCM TIM 3/8 water connector	A41941712
EPX180L Dry pump 400V, 3/8 Water connectors	A41941014
EPX180L Dry pump 200V	A41941002
EPX180L Dry pump 200V, 3/8 water connector	A41941012
EPX180L Dry pump 208V C3 TIM 3/8 water connector	A41941112
EPX180L Dry pump 400V 1/4 water connector	A41941024
EPX180L Dry pump 208V C3 TIM 3/8 water connector	A41941142
EPX180L Dry pump 208V C3 TIM 3/8 water connector	A41941152
EPX180L Dry pump 400V SPI TIM 3/8 water connector	A41941214



# EPX180LE Dry Pump



The new compact EPX180 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX180 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX180 offers outstanding performance in a package that is 20 lighter, 30 smaller and requires 40 less power than the IPX.

The EPX LE series of pumps has an End User Controller (EUC). The End User Controller enables

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

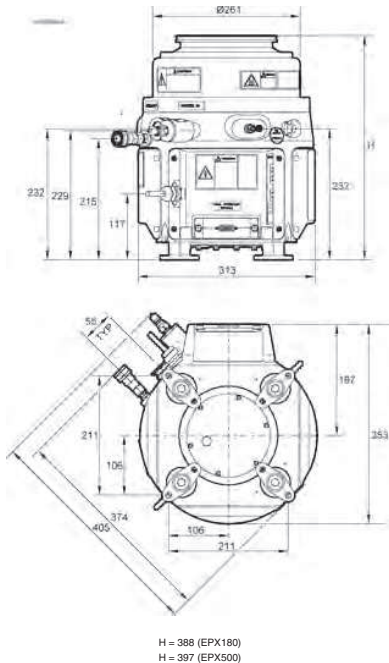
The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

The EPX 'LE' Series has been designed for use clean duty applications pumping inert gas mixtures, such as loadlock, whereby control is provided by the process tool interface.

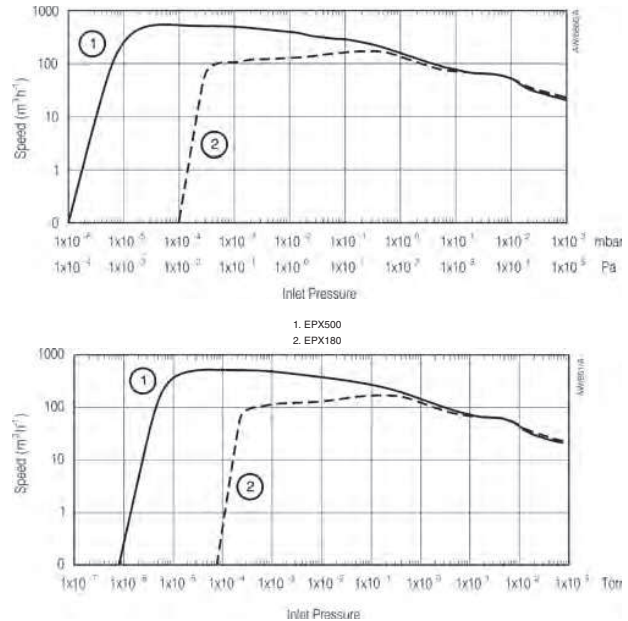
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Page  
242

## Dimensions



## Performance Curves



## Technical Data

Peak speed	170 m <sup>3</sup> h <sup>-1</sup> 105 ft <sup>3</sup> min <sup>-1</sup> 2835 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-4</sup> mbar <7.5 x 10 <sup>-5</sup> Torr <1 x 10 <sup>-2</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO63
Outlet flange	NW25
Noise	<59 dB(A)
Water connectors	3/8 in Quick
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	None
Weight	43.5 kg

## Ordering Information

Product Description	Order No.
EPX180LE Dry Pump 208V No TIM 3/8 water connector	A41943012
EPX180LE Dry Pump 400V No TIM 3/8 water connectors	A41943014
EPX180LE Dry Pump 208V No TIM 1/4 water connector	A41943022
EPX180LE Dry Pump 400V No TIM 1/4 water connectors	A41943024
EPX180LE Dry Pump 208V C3 TIM 3/8 water connector	A41943112
EPX180LE Dry Pump 208V SPI TIM 3/8 water connector	A41943212
EPX180LE Dry Pump 208V SPI TIM 1/4 water connector	A41943222
EPX180LE Dry Pump 400V SPI TIM 1/4 water connectors	A41943224
EPX180LE Dry Pump 208V TEL TIM 3/8 water connector	A41943412
EPX180LE Dry Pump 208V Hitachi TIM 3/8 water connector	A41943612
EPX180LE Dry Pump 208V MCM TIM 3/8 water connector	A41943712
EPX180LE Dry Pump 400V MCM TIM 3/8 water connectors	A41943714
EPX180LE Dry Pump 208V MCM TIM 1/4 water connector	A41943722

# EPX180N Dry pump



The new compact EPX180 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX180 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX180 offers outstanding performance in a package that is 20% lighter, 30% smaller and requires 40% less power than the IPX.

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

- The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

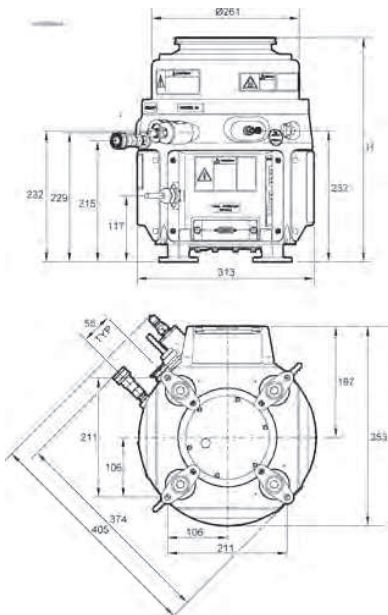
The EPX 'N' Series include a gas module that provides Nitrogen purge extending the application range to medium processes in which low levels of corrosive vapors and particulates are expected:

- Load Lock
- Transfer Chamber
- PVD sputtering
- Ashing/PR Strip

7

Page  
244

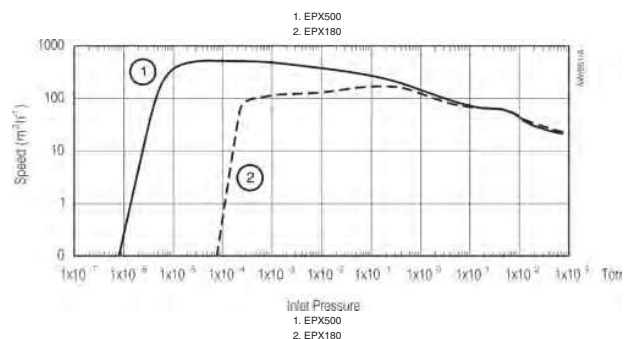
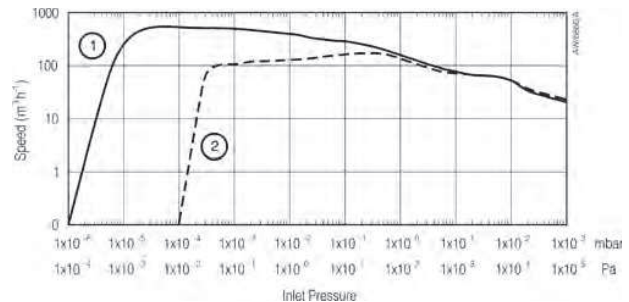
## Dimensions



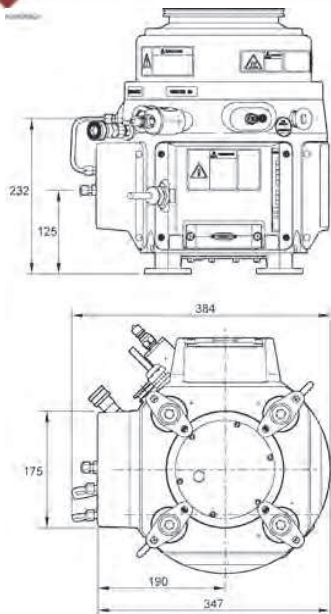
H = 388 (EPX180)  
H = 397 (EPX500)

For all remaining dimensions, please refer to the next dimensional image.

## Performance Curves







For all remaining dimensions, please refer to the previous dimensional image.

## Technical Data

Peak speed	170 m <sup>3</sup> h <sup>-1</sup> 105 ft <sup>3</sup> min <sup>-1</sup> 2835 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-4</sup> mbar <7.5 x 10 <sup>-5</sup> Torr <1 x 10 <sup>-2</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO63
Outlet flange	NW25
Noise	<59 dB(A)
Water connectors	3/8 in Quick
Minimum cooling water flow rate	2 l min <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Nitrogen supply interface	1/4 in (6.5 mm) tube
Nitrogen supply pressure	3 x 10 <sup>5</sup> – 7 x 10 <sup>5</sup> pa
Minimum nitrogen purity	0.9995
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	C3
Weight	43.5 kg

## Ordering Information

Product Description	Order No.
EPX180N Dry pump 208V C3 TIM 3/8 water connector	A41942112
EPX180N Dry pump 208V SPI TIM 3/8 water connector	A41942212
EPX180N Dry pump 208V SPI TIM 1/4 water connector	A41942222
EPX180N Dry pump 208V E73 TIM 3/8 water connector	A41942312
EPX180N Dry pump 208V TEL TIM 3/8 water connector	A41942412
EPX180N Dry pump 400V TEL TIM 3/8 water connectors	A41942414
EPX180N Dry pump 208V MCM TIM 3/8 water connector	A41942712
EPX180N Dry pump 400V MCM TIM 3/8 water connectors	A41942714
EPX180N Dry pump 400V, 3/8 water connector	A41942014

# EPX180NE Dry pump



The new compact EPX180 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX180 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX180 offers outstanding performance in a package that is 20% lighter, 30% smaller and requires 40% less power than the IPX.

The EPX NE series of pumps has an End User Controller (EUC). The End User Controller enables local control for stand-alone use as well as the ability to connect to a fab-wide

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

- The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

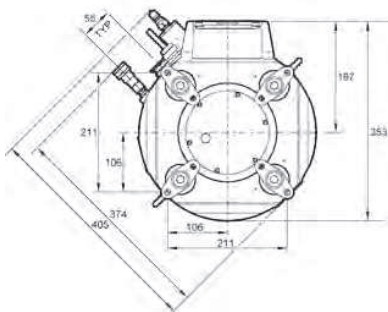
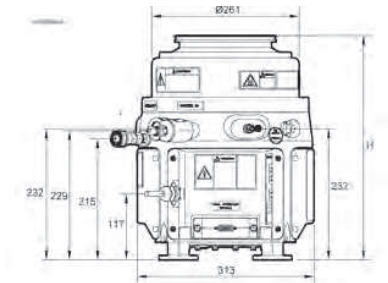
The EPX 'N' Series include a gas module that provides Nitrogen purge extending the application range to medium processes in which low levels of corrosive vapors and particulates are expected:

- Load Lock
- Transfer Chamber
- PVD sputtering
- Ashing/PR Strip

7

Page  
246

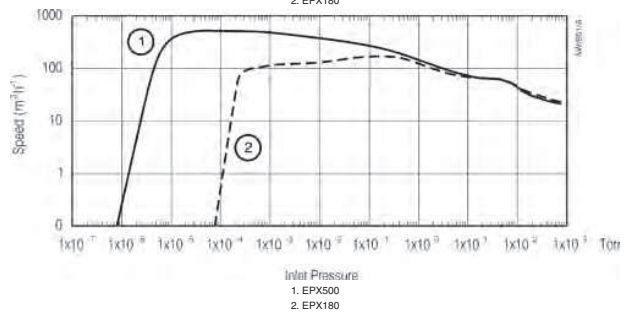
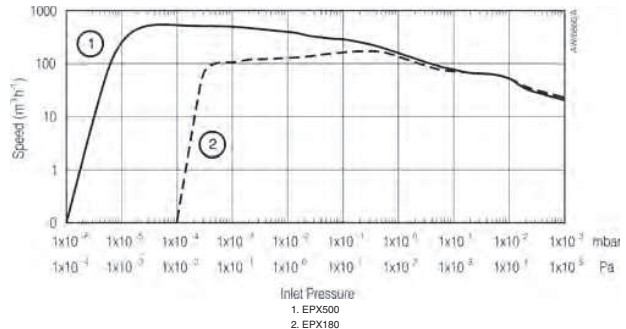
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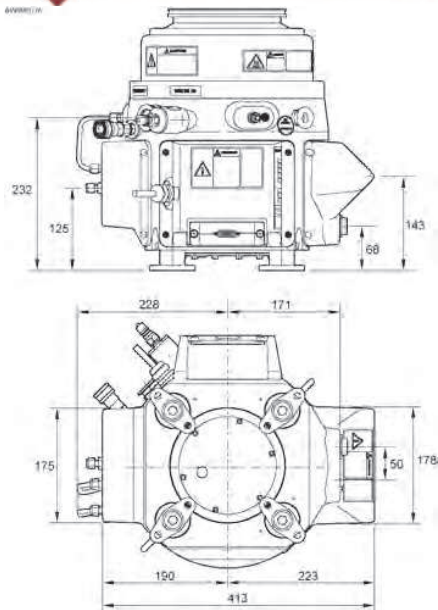


H = 388 (EPX180)  
H = 397 (EPX500)

For all remaining dimensions, please refer to the next dimensional image.

## Performance Curves





For all remaining dimensions, please refer to the previous dimensional image.

## Technical Data

Peak speed	170 m <sup>3</sup> h <sup>-1</sup> 105 ft <sup>3</sup> min <sup>-1</sup> 2835 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-4</sup> mbar <7.5 x 10 <sup>-5</sup> Torr <1 x 10 <sup>-2</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO63
Outlet flange	NW25
Noise	<59 dB(A)
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Nitrogen supply interface	1/4 in (6.5 mm) tube
Nitrogen supply pressure	3 x 10 <sup>5</sup> – 7 x 10 <sup>5</sup> pa
Minimum nitrogen purity	0.9995
Electrical Supply	400 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	None
Weight	43.5 kg

## Ordering Information

Product Description	Order No.
EPX180NE Dry pump 400V No TIM 3/8 water connector	A41944014
EPX180NE Dry pump 208V SPI TIM 3/8 water connector	A41944212
EPX180NE Dry pump 400V SPI TIM 1/4 water connectors	A41944224
EPX180NE Dry pump 208V TEL TIM 3/8 water connector	A41944412
EPX180NE Dry pump 400V TEL TIM 3/8 water connectors	A41944414
EPX180NE Dry pump 400V TEL TIM 1/4 water connectors	A41944424
EPX180NE Dry pump 208V LAM TIM 3/8 water connector	A41944512
EPX180NE Dry pump 400V LAM TIM 3/8 water connectors	A41944514
EPX180NE Dry pump 208V MCM TIM 3/8 water connector	A41944712
EPX180NE Dry pump 400V MCM TIM 3/8 water connectors	A41944714
EPX180NE Dry pump 400V MCM TIM 1/4 water connectors	A41944724
EPX180NE Dry pump 208V No TIM 3/8 water connector	A41944012

# EPX500L Dry Pump



The new compact EPX500 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX500 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX500 offers outstanding performance in a package that is 20% lighter, 30% smaller and requires 40% less power than the IPX.

## Features & Benefits

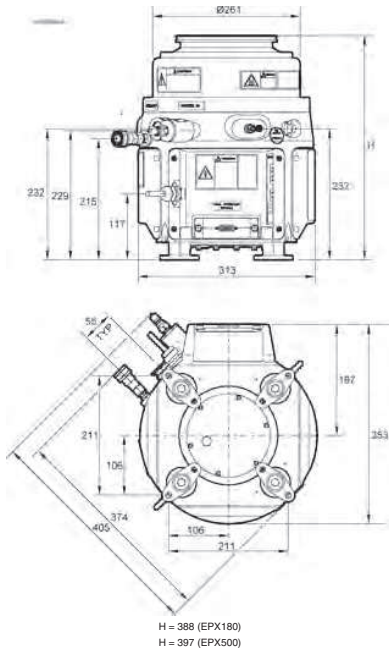
- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

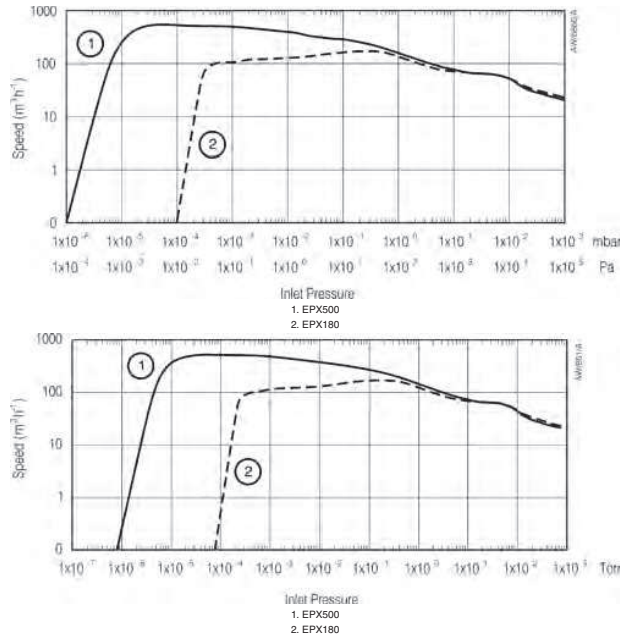
The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

The EPX 'L' Series has been designed for use clean duty applications pumping inert gas mixtures, such as loadlock, whereby control is provided by the process tool interface.

## Dimensions



## Performance Curves



## Technical Data

Peak speed	500 m <sup>3</sup> h <sup>-1</sup> 295 ft <sup>3</sup> min <sup>-1</sup> 8338 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-6</sup> mbar <7.5 x 10 <sup>-7</sup> Torr <1 x 10 <sup>-4</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO160
Outlet flange	NW25
Noise	<59 dB(A)
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	C3
Weight	45.2 kg

## Ordering Information

Product Description	Order No.
EPX500L Dry Pump 208V SPI TIM 3/8 water connector	A41951212
EPX500L Dry Pump 400V SPI TIM 3/8 water connectors	A41951214
EPX500L Dry Pump 208V SPI TIM 1/4 water connector	A41951222
EPX500L Dry Pump 400V E73 TIM 3/8 water connectors	A41951314
EPX500L Dry pump 400V LAM TIM 3/8 water connectors	A41951514
EPX500L Dry Pump 400V MCM TIM No water connectors	A41951704
EPX500L Dry pump 208V MCM TIM 3/8 water connector	A41951712
EPX500L Dry pump 400V MCM TIM 3/8 water connectors	A41951714
EPX500L Dry Pump 208V C3 TIM 3/8 water connector	A41951112
EPX500L Dry Pump 200V	A41951002
EPX500L Dry Pump 400V	A41951004
EPX500L Dry Pump 400V SPI TIM 3/8 water connectors	A41951014



# EPX500LE Dry pump



The new compact EPX500 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX500 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX500 offers outstanding performance in a package that is 20% lighter, 30% smaller and requires 40% less power than the IPX.

The EPX LE series of pumps has an End User Controller (EUC). The End User Controller enables local control for stand-alone use as well as the ability to connect to a fab-wide

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
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- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
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## Applications

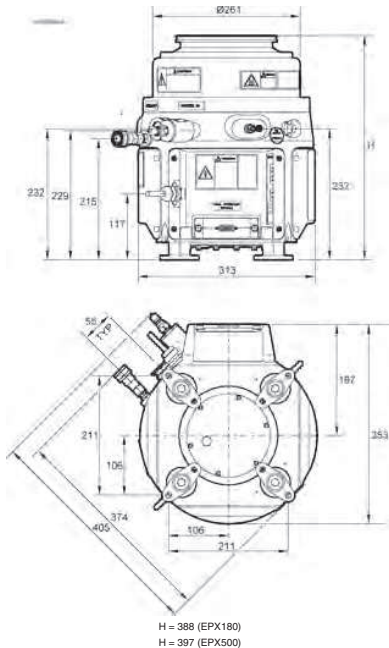
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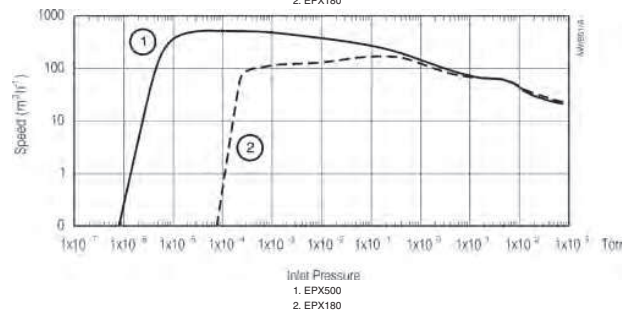
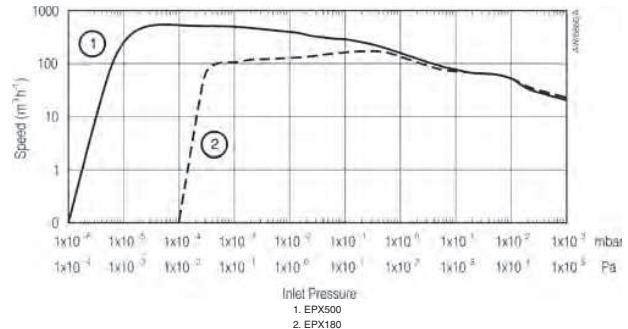
Page  
250

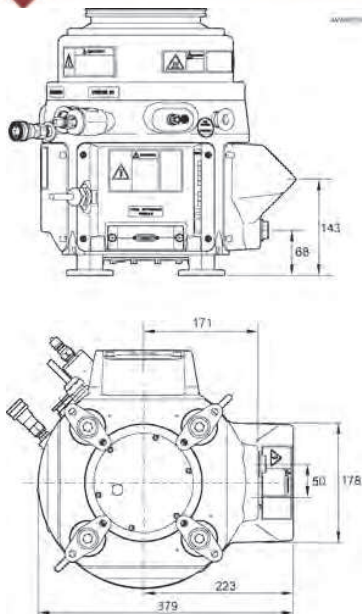
## Dimensions



For all remaining dimensions, please refer to the next dimensional image.

## Performance Curves





For all remaining dimensions, please refer to the previous dimensional image.

## Technical Data

Peak speed	500 m <sup>3</sup> h <sup>-1</sup> 295 ft <sup>3</sup> min <sup>-1</sup> 8338 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-6</sup> mbar <7.5 x 10 <sup>-7</sup> Torr <1 x 10 <sup>-4</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO160
Outlet flange	NW25
Noise	<59 dB(A)
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	None
Weight	45.2 kg

## Ordering Information

Product Description	Order No.
EPX500LE Dry pump 208V No TIM 3/8 water connector	A41953012
EPX500LE Dry pump 400V No TIM 3/8 water connectors	A41953014
EPX500LE Dry pump 208V E73 TIM 3/8 water connector	A41953312
EPX500LE Dry pump 208V TEL TIM 3/8 water connector	A41953412
EPX500LE Dry pump 208V MCM TIM 3/8 water connector	A41953712

# EPX500N Dry Pump



The new compact EPX500 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX500 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX500 offers outstanding performance in a package that is 20% lighter, 30% smaller and requires 40% less power than the IPX.

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

- The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

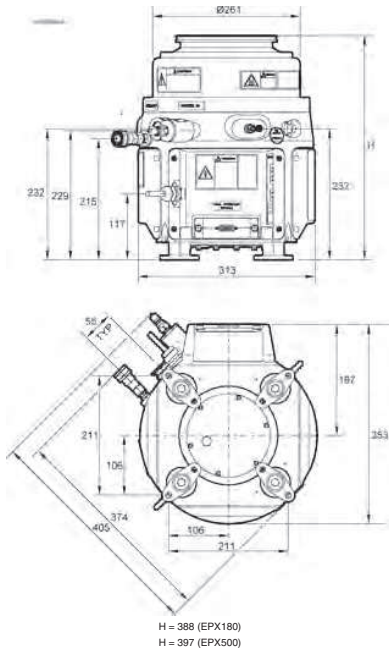
The EPX 'N' Series include a gas module that provides Nitrogen purge extending the application range to medium processes in which low levels of corrosive vapors and particulates are expected:

- Load Lock
- Transfer Chamber
- PVD sputtering
- Ashing/PR Strip

7

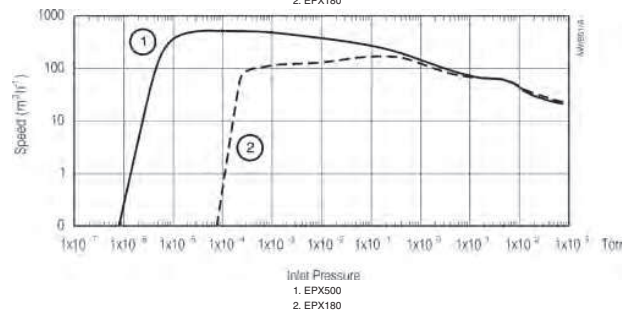
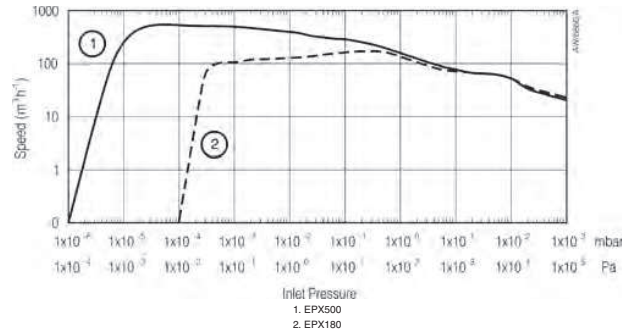
Page  
252

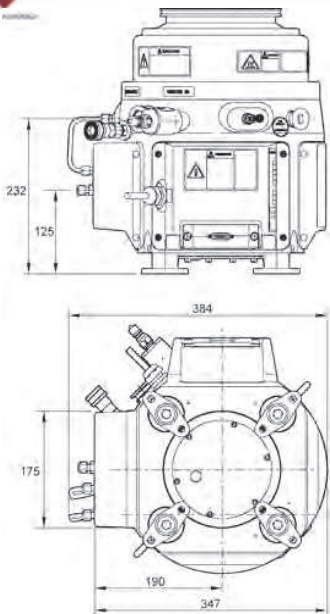
## Dimensions



For all remaining dimensions, please refer to the next dimensional image.

## Performance Curves





For all remaining dimensions, please refer to the previous dimensional image.

## Technical Data

Peak speed	500 m <sup>3</sup> h <sup>-1</sup> 295 ft <sup>3</sup> min <sup>-1</sup> 8338 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-6</sup> mbar <7.5 x 10 <sup>-7</sup> Torr <1 x 10 <sup>-4</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO160
Outlet flange	NW25
Noise	<59 dB(A)
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Nitrogen supply interface	1/4 in (6.5 mm) tube
Nitrogen supply pressure	3 x 10 <sup>5</sup> – 7 x 10 <sup>5</sup> pa
Minimum nitrogen purity	0.9995
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	C3
Weight	45.2 kg

## Ordering Information

Product Description	Order No.
EPX500N Dry pump 208V C3 TIM 3/8 water connector	A41952112
EPX500N Dry pump 208V SPI TIM 3/8 water connector	A41952212
EPX500N Dry pump 208V SPI TIM 1/4 water connector	A41952222
EPX500N Dry pump 400V TEL TIM 3/8 water connectors	A41952414
EPX500N Dry pump 208V TEL TIM 1/4 water connector	A41952422
EPX500N Dry pump 208V MCM TIM 3/8 water connector	A41952712
EPX500N Dry pump 400V, 3/8 water connector	A41952014



# EPX500NE Dry pump



The new compact EPX500 high vacuum drypump offers enhanced performance with reduced cost of ownership. Using a unique patent protected mechanism the EPX500 is capable of pumping from atmosphere to ultimate pressures of  $<7 \times 10^{-5}$  Torr.

Based on the successful award winning IPX range, the modular EPX500 offers outstanding performance in a package that is 20% lighter, 30% smaller and requires 40% less power than the IPX.

The EPX NE series of pumps has an End User Controller (EUC). The End User Controller enables local control for stand-alone use as well as the ability to connect to a fab-wide

## Features & Benefits

- Compact footprint - as one of the smallest on-tool pumps available, the EPX offers outstanding savings in footprint. EPX can be mounted directly onto the tool saving foreline and installations costs or remotely if preferred.
- Low cost of ownership - EPX requires only 1.4 kW of power and incorporating idle mode to maximize power efficiency.
- Unique patent protected pumping mechanism - the EPX can pump down from atmosphere to turbomolecular base pressure and can operate continuously at all inlet pressures.
- Ultra clean mechanism - conventional high vacuum bearings under grease use grease lubrication which can be a source of contamination in process tools. EPX pumps have no high vacuum bearings under grease and present no other source of potential contamination.
- Extremely reliable - based on field proven IPX technology, the EPX has a  $MTBF_p = 13$  years (SEMI E10) with service periods of around every 5 years to maximize the life of the pump.

## Applications

- The EPX series covers a broad range of applications from wafer handling through to medium duty processes.

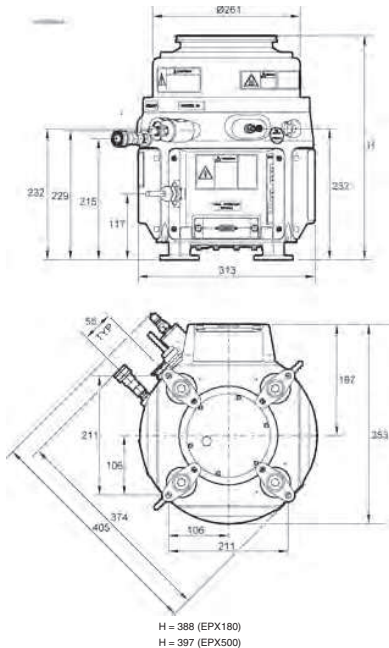
The EPX 'N' Series include a gas module that provides Nitrogen purge extending the application range to medium processes in which low levels of corrosive vapors and particulates are expected:

- Load Lock
- Transfer Chamber
- PVD sputtering
- Ashing/PR Strip

7

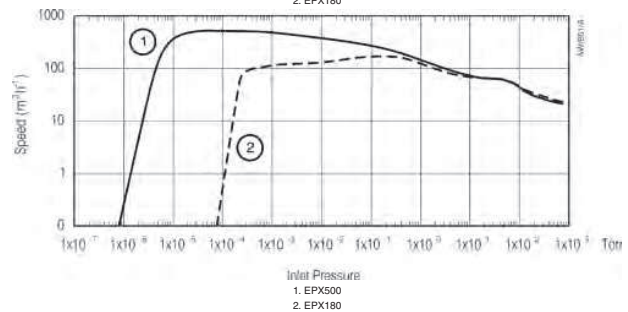
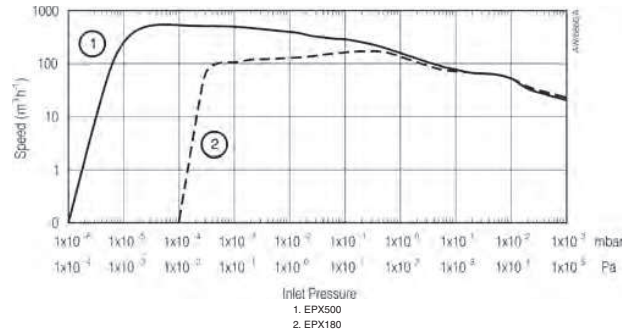
Page  
254

## Dimensions

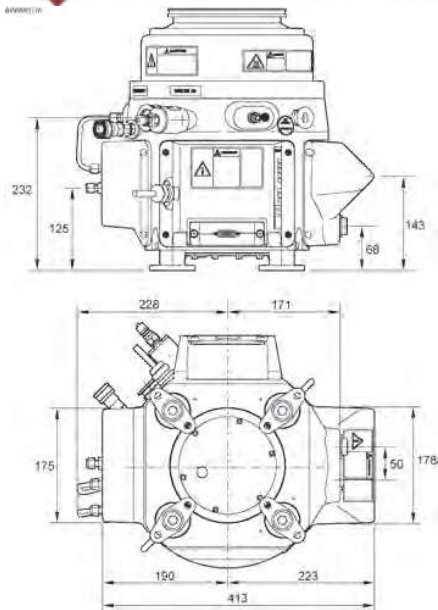


For all remaining dimensions, please refer to the next dimensional image.

## Performance Curves







For all remaining dimensions, please refer to the previous dimensional image.

## Technical Data

Peak speed	500 m <sup>3</sup> h <sup>-1</sup> 295 ft <sup>3</sup> min <sup>-1</sup> 8338 l min <sup>-1</sup>
Ultimate vacuum	<1 x 10 <sup>-6</sup> mbar <7.5 x 10 <sup>-7</sup> Torr <1 x 10 <sup>-4</sup> Pa
Warm-up time (to nominal performance)	30 min
Inlet flange	ISO160
Outlet flange	NW25
Noise	<59 dB(A)
Minimum cooling water flow rate	2 l m <sup>-1</sup>
Cooling water temperature	15 – 35 °C
Nitrogen supply interface	1/4 in (6.5 mm) tube
Nitrogen supply pressure	3 x 10 <sup>5</sup> – 7 x 10 <sup>5</sup> pa
Minimum nitrogen purity	0.9995
Electrical Supply	200/208 V, 50/60 Hz 3 phase
Power at ultimate	1.4 kW
Rated motor power	3.0 kW
TIM	None
Weight	45.2 kg

## Ordering Information

Product Description	Order No.
EPX500NE 208V No TIM 3/8 water connector	A41954012
EPX500NE 400V No TIM 3/8 water connector	A41954014
EPX500NE 208V No TIM 1/4 water connector	A41954022
EPX500NE 208V SPI TIM 3/8 water connector	A41954212
EPX500NE 400V SPI TIM 1/4 water connectors	A41954224
EPX500NE 208V TEL TIM 3/8 water connector	A41954412
EPX500NE 400V TEL TIM 3/8 water connectors	A41954414
EPX500NE 400V TEL TIM 1/4 water connectors	A41954424
EPX500NE 208V LAM TIM 3/8 water connector	A41954512
EPX500NE 208V MCM TIM 3/8 water connector	A41954712
EPX500NE 400V MCM TIM 3/8 water connectors	A41954714

# GX100 Dry Pump



The GX Dry Vacuum Pump Series sets new standards for zero maintenance between major overhauls. Improved efficiency lowers the cost of ownership and provides continuous pumping duty throughout the pressure range.

GX drypumps include Ethernet connectivity allowing key data to be viewed via web pages, as well as a comprehensive set of networking options to assure continuous pump availability.

GX pumps are available in a wide range of peak speeds and variants to address applications from clean through to medium-duty processes. A modular design allows users

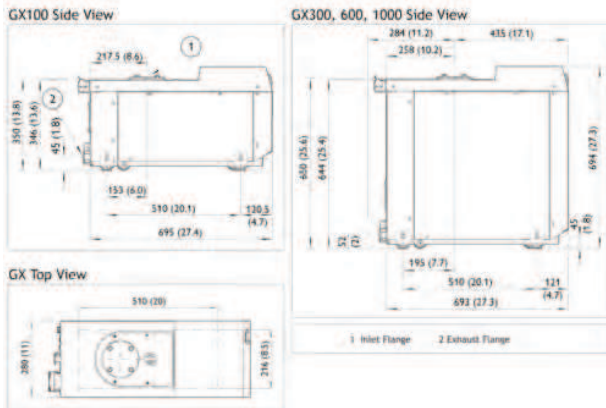
## Features & Benefits

- Reduced Cost of Ownership
- Up to a 50% reduction in utilities cost compared to iL/iH drypumps
- No preventative maintenance
- Flexible Installation Options
- Small and light for easy installation

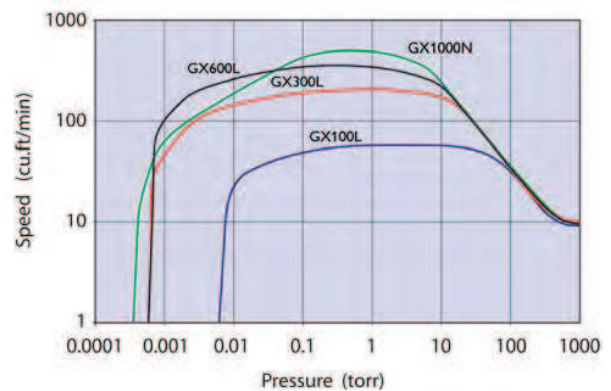
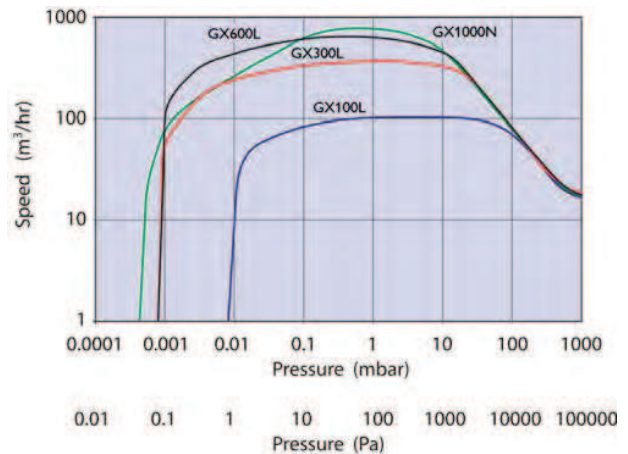
## Applications

- Load Lock
- Transfer
- Metrology

## Dimensions



## Performance Curves



## Technical Data

### Performance

Peak speed	105 m <sup>3</sup> h <sup>-1</sup>
	62 ft <sup>3</sup> min <sup>-1</sup>
	1750 l min <sup>-1</sup>
Ultimate pressure	5.00E <sup>-03</sup> mbar
	3.75E <sup>-03</sup> Torr
	0.50 Pa

### Power at 700 Torr exhaust

Ultimate	1.0 kW
AUC (Active Utility Controller)	0.05 kW
Water *	
Water inlet	1.0 slm
Nitrogen	0 slm

### Installation Details

Footprint (excluding exhaust)	0.20 m <sup>2</sup>
Weight	120 kg
Inlet connection	ISO 63
Outlet connection	NW25
Noise at ultimate	<55 dB(A)

\* Requires Constant Flow Valve accessory

## Ordering Information

Product Description	Order No.
GX100L Dry Pump 200-230 V 50/60 Hz	A54710958
GX100L Dry Pump 380-460 V 50/60 Hz	A54710959
GX100TI Dry Pump 200-230 V 50/60 Hz	A54746958
GX100N Dry Pump 200-230 V 50/60 Hz	A54711958
GX100N Dry Pump 380-450 V 50/60 Hz	A54711959

# GX600 Dry Pump



The GX Dry Vacuum Pump Series sets new standards for zero maintenance between major overhauls. Improved efficiency lowers the cost of ownership and provides continuous pumping duty throughout the pressure range.

GX drypumps include Ethernet connectivity allowing key data to be viewed via web pages, as well as a comprehensive set of networking options to assure continuous pump availability.

GX pumps are available in a wide range of peak speeds and variants to address applications from clean through to medium-duty processes. A modular design allows users

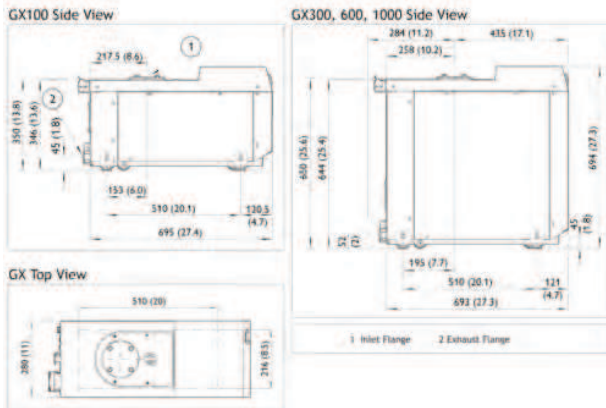
## Features & Benefits

- Reduced Cost of Ownership
- Up to a 50% reduction in utilities cost compared to iL/iH drypumps
- No preventative maintenance
- Flexible Installation Options
- Small and light for easy installation

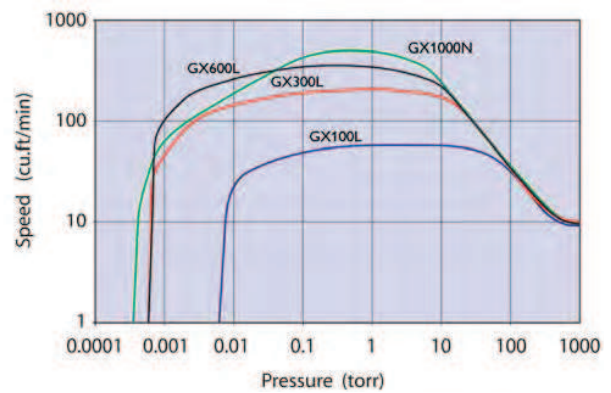
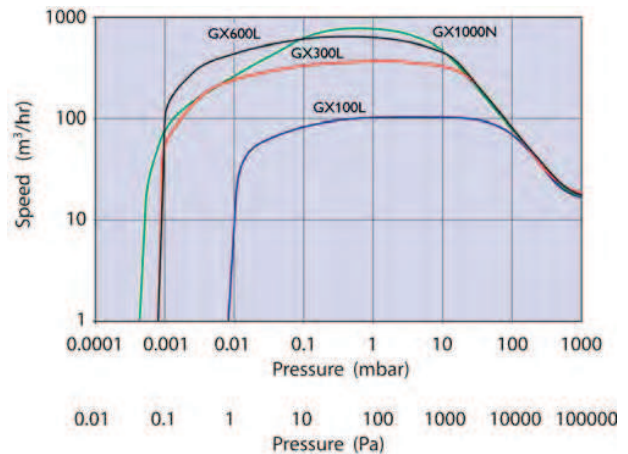
## Applications

- Load Lock
- Transfer
- Metrology

## Dimensions



## Performance Curves



## Technical Data

Performance	
Peak speed	620 m <sup>3</sup> h <sup>-1</sup> 365 ft <sup>3</sup> min <sup>-1</sup> 10333 l min <sup>-1</sup>
Ultimate pressure	7.00E <sup>-04</sup> mbar 5.25E <sup>-04</sup> Torr 0.07 Pa
Power at 700 Torr exhaust	
Ultimate	1.6 kW
AUC (Active Utility Controller)	0.05 kW
Water *	
Water inlet	2.0 slm
Nitrogen	0 slm
Installation Details	
Footprint (excluding exhaust)	0.20 m <sup>2</sup>
Weight	220 kg
Inlet connection	ISO 100
Outlet connection	NW25
Noise at ultimate	<55 dB(A)

\* Requires Constant Flow Valve accessory

## Ordering Information

Product Description	Order No.
GX600L Dry Pump 200-230 V 50/60 Hz	A54730958
GX600L Dry Pump 380-460 V 50/60 Hz	A54730959
GX600N Dry Pump 200-230 V 50/60 Hz	A54731958
GX600N Dry Pump 380-450 V 50/60 Hz	A54731959



# GX1000 Dry Pump



The GX Dry Vacuum Pump Series sets new standards for zero maintenance between major overhauls. Improved efficiency lowers the cost of ownership and provides continuous pumping duty throughout the pressure range.

GX drypumps include Ethernet connectivity allowing key data to be viewed via web pages, as well as a comprehensive set of networking options to assure continuous pump availability.

GX pumps are available in a wide range of peak speeds and variants to address applications from clean through to medium-duty processes. A modular design allows users

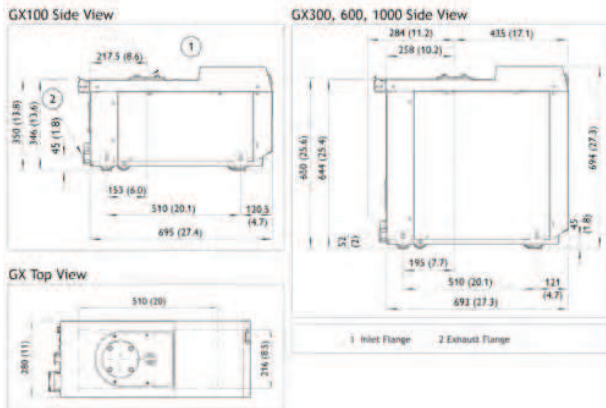
## Features & Benefits

- Reduced Cost of Ownership
- Up to a 50% reduction in utilities cost compared to iL/iH drypumps
- No preventative maintenance
- Flexible Installation Options
- Small and light for easy installation

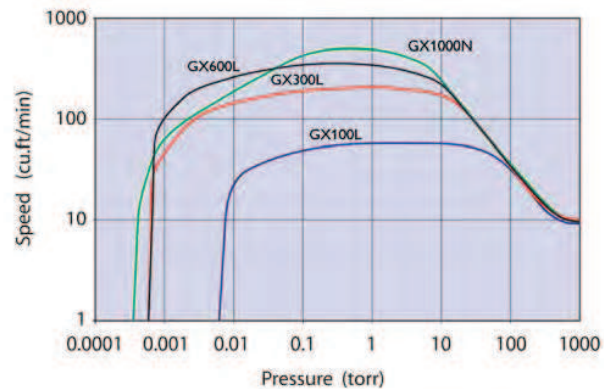
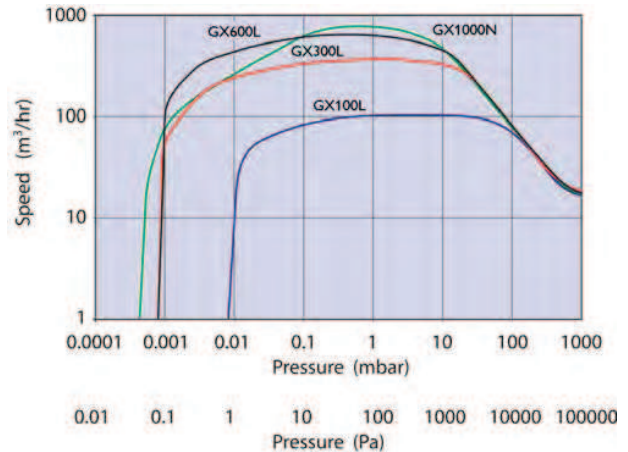
## Applications

- Load Lock
- Transfer
- Metrology
- Lithography
- PVD Process

## Dimensions



## Performance Curves



## Technical Data

### Performance

Peak speed	800 m <sup>3</sup> h <sup>-1</sup> 471 ft <sup>3</sup> min <sup>-1</sup> 13333 l min <sup>-1</sup>
Ultimate pressure	1.00E <sup>-03</sup> mbar 7.50E <sup>-04</sup> Torr 0.10 Pa
Power at 700 Torr exhaust	
Ultimate	1.6 kW
AUC (Active Utility Controller)	1.05 kW
Water *	
Water inlet	2.0 slm
Nitrogen	4 or 14 slm **
Installation Details	
Footprint (excluding exhaust)	0.20 m <sup>2</sup>
Weight	230 kg
Inlet connection	ISO 100
Outlet connection	NW25
Noise at ultimate	<55 dB(A)

\* Requires Constant Flow Valve accessory

\*\* Nitrogen purge can be manually adjusted to a maximum flow of 39slm

## Ordering Information

Product Description	Order No.
GX1000N Dry Pump 200-230 V 50/60 Hz	A54781958
GX1000N Dry Pump 380-460 V 50/60 Hz	A54781959

# Exhaust Management for Semiconductor Processes

## Comprehensive Range

Edwards is unique in offering the broadest range of exhaust management technologies, demonstrated in a series of products and systems designed to meet all customer requirements – from low-cost facility management to full environmental protection. We are committed to supplying exhaust management systems that match customer specific application requirements. We strive to minimise cost of ownership while introducing innovative designs to achieve greater reliability, longer service intervals, reduced space and utilities requirements and lower waste emissions.

## Leading-Edge Manufacturing

Our primary manufacturing facility is located at Clevedon in the UK. The site comprises a factory with flexible production lines, assembly feed cells, just-in-time manufacturing techniques and one of the largest exhaust management research centers in the world. Additional manufacturing sites located at Chunan (Korea) and Ina (Japan) complement the global production capability. Underpinning our whole operation is a commitment to quality and world class manufacturing standards. An ISO 9001 and ISO 14001 management system, supported by TQM and Kaizen methodologies, is at the core of the operation. Product certification to the relevant international standard is conducted by ITS, the independent external test house.

## Thermal Processing

Effective exhaust management of CVD processes must be able to handle the deposition gases and the associated powders. The fluoride wastes from cleaning gases also require suitable treatment along with the global warming gases. Abatement systems must be able to comply with these requirements in one complete unit.

The TPU (Thermal Processing Unit) is the industry standard abatement system for CVD. One model is suitable for all CVD and many etch applications. Each inlet can be configured for high level abatement of all Global Warming PFC gases, F<sub>2</sub> or ClF<sub>3</sub>. The TPU can accommodate total input flows up to 280 slpm.

Where PFCs are not used, the TCS (Thermal Conditioning System) provides a cost-effective means of handling both hazardous fluoride waste and deposition gases.

The Helios is an advanced solution for the abatement of high hydrogen flows designed to handle both toxic and carrier gases from Low Pressure Epitaxy and MOCVD processes.

Atlas The Atlas range is the latest addition to the inward fired combustor range available in TPU, TCS and Kronis variants, the range offers the same excellent performance with added benefits of reduced utilities and cost of ownership savings as standard.

The Kronis provides effective treatment for low k CVD process exhausts.

The HOx (Hot Oxidation System) offers an innovative electrical heated oxidation unit and the proven three-stage wet scrubber of the combustor product line, it combines superior performance for the abatement of CVD processes in facilities which do not have the ability to use fuel gas.



GRC technology has been used to abate the exhaust gas streams on a wide range of semiconductor applications. (Photograph courtesy of TI, Dallas, USA.)

## Gas Reactor Columns

Edwards offers a range of low-cost, point-of-use dry abatement systems for semiconductor processing. Each system uses the unique hot bed reactor technology developed for the GRC (Gas Reactor Column) range. The Inline 250 is the highest performance of any dry abatement technology for etch exhausts. It provides treatment by chemical reaction to stable inert salts and treats the widest range of gases from halogens and acids to ClF<sub>3</sub>, NF<sub>3</sub>, SF<sub>6</sub> and other halide etch compounds. The D150 Dual GRC provides dual-cartridge operation thus minimising the cost of ownership with 100% uptime. The M150 Single GRC is a compact dry gas treatment system for removing hazardous etch and CVD emissions at the source, converting them into harmless solids within an easily changed and disposable cartridge.

## Wet Scrubbers

Edwards new range of wet scrubbers provide exhaust management at minimal cost for preservation of assets and regulatory compliance.

Tempest is a point of use wet scrubber suitable for the treatment of semiconductor process tool exhausts containing water-soluble and water-reactive gases such as HCl, Cl<sub>2</sub> and NH<sub>3</sub>.

## Pyrophoric Conditioning

For the removal of silane and pyrophoric gases to below lower explosion level (LEL) the PCS (Pyrophoric Conditioning System) offers an advanced solution. Specifically designed for the safe handling of silane, the PCS incorporates a unique particle handling system to keep ducts free from powders.

## Integrated Vacuum and Exhaust Management Systems

Vacuum equipment and exhaust management devices are traditionally installed side-by-side, beneath the process tool. The Zenith range now offers a series of process-specific, fully integrated vacuum pump and exhaust management systems designed to safely handle the process exhausts from a wide range of applications. Enhanced safety, process tool compatibility, minimum footprint and reduced cost of ownership are key benefits derived from our unique approach, resulting in improved uptime, process efficiency and profitability.

## TMS Temperature Management System

Edwards offers TMS (Temperature Management System) for processes involving condensable byproducts. TMS ensures that these compounds remain volatile until they enter the abatement device. The TMS is designed to heat both forelines and pump exhaust lines to the inlet of the abatement device. Moulded high surface area heaters maximize contact with pipes and are designed to maintain the temperature of the pipe between 90° and 150 °C. TMS monitoring is available as an option to provide both local and remote verification that the line is at a sufficient temperature. TMS has been successfully used in conjunction with the entire range of Edwards exhaust management equipment to alleviate the problems historically associated with solid deposition and corrosion.

## Product Selection

Using our product selection guide customers have the opportunity to decide which Edwards point-of use abatement equipment is most suitable for their particular application on the basis of their exhaust gas management goals. Edwards will provide their experience and expertise to specify the exhaust management product for the chosen application.

# Product Selection Guide

PROCESS	GASES	ISSUES	Zenith			Fuel				Non Fuel				Exhaust Management			Vacuum				
			ETCH	EPI	III-V	TPU / ATLAS TCS / Helios	KRONIS / ATLAS	SPECTRA Z	SPECTRA G	HOX	MISTRAL	TEMPEST	i250	GRC M150	GANCAT	PCS		WCT	WESP	TMS	iH
ETCH	Dielectric	$CHF_3/NF_3/CF_4/C_2F_6/C_4F_8/SF_6/C_2F_4/C_2F_6/CH_3F$	●			●															
	Conductive – poly silicon	$O_2/HBr/SF_6/CF_4/CHF_3$	●			●															
	Conductive – metal	$Cl_2/BCl_3/CF_4/CHF_3$	●			●															
PECVD	Silane-based oxide/nitride/HDP	$SiH_4/NH_3/N_2O/PH_3/SiF_4$ with $NF_3$ clean	●			●															
	TEOS based oxide/BPSG	TEOS/TBB/TEP with PFC clean with $NF_3$ clean	●			●															
	Low k CVD	3MS/AMS/TMCTS with $NF_3$ clean	●			●															
CVD	Metallisation – tungsten Clean step	$SiH_4/WF_6/H_2$ with PFC clean with $NF_3$ clean	●			●															
	Metallisation – titanium	$TiCl_4/NH_3/CF_4/Cl_2$	●			●															
	High k CVD	High k precursors $SiH_4/PH_3/AsH_3$	●			●															
LPCVD	Poly silicon Clean step	none with $F_2/HF$ with $ClF_3$	●			●															
	LPCVD Nitride Clean step	HCD/DOS/ $NH_3$ with $F_2/HF$	●			●															
	Low pressure EPI	$H_2/DCS/PH_3/SiH_4/AsH_3/B_2H_6/GeH_4/HfCl_4$	●			●															
EPITAXY	Phosphide	$H_2/AsH_3/PH_3/TMG/TMA/TMI$	●			●															
	Nitride	$N_2/H_2/NH_3/TMG/TMA/TMI$	●			●															
FLAT PANEL DISPLAY & SOLAR CELL	Etch	$H_2/O_2/CF_4/Cl_2/HCl/He/SF_6$	●			●															
	CVD	$SiH_4/NH_3/NF_3/F_2/SF_6$	●			●															

● Full environment safety and health management ▲ Health safety and capital asset protection

ATLAS	CVD	ETCH	EPI	III-V	ERIX	GANCAT	TPU	TCS	Helios	Kronis	Spectra Z	Spectra G
HOX	Mistral	Tempest	i250	GANCAT	GRC M150	PCS	WCT	WESP	TMS	iH	GX	