Introducing a Unique Alternative to Cryo Pumping

MicroStar™

a self-contained cryogenic water vapor pump

Features	Benefits
No external compressor or gas lines	Compact-Easy installation and saving on footprint
Patented fast regeneration-No need for heaters	Simple and safe system (fire and combustion hazard free)
MTBF>30,000 HRS	Simple and "bullet proof" cryo mechanism
Cooler is controlled by a simple easy to use temperature controller	• Base temp is user adjustable and can be altered "on the fly" • Temp stability can be set to a level of ±0.2 Kelvin
Unique Stirling cryo cooler to chill the cryogenic panel	Stirling-The most production worthy efficient cooling cycle-low input power
Maintenance Free	Low cost of ownership
Controller includes RS-232 and discrete signals outputs	Easy and simple pump to tool integration

General

The MicroStar is a state-of-the-art, completely self-contained, compact cryogenic water vapor pump. Unlike conventional systems, it does not require a separate helium compressor and gas lines.
This enables fast, simple and painless pump to tool integration, at the lowest possible cost.

Features

New Approach To Cryo-Pumping

The MicroStar combined with turbo pump (TMP-mechanical or magnetic levitated bearings) addresses some of the main flaws that exist with traditional Cryo pumping.
A TurboStar – combination of TMP and MicroStar – offers reduced partial pressure of water and total base pressure together with saving up to 50% of the pump down time.

	Cryo Pump	TurboStar
High Water Vapor Pumping Speed	Good	Good
Regeneration	Often	Rarely
Self contained-On the tool pumping setup	No	Yes
Ability to pump toxic, corrosive explosive gasses	No, Hazardous!	Yes
Ability to withstand hi flow processes	Problematic	Good
Sub Fab space	Required	Not required
Constant permanent gasses speed	Poor	Good

The MicroStar can be utilized as an upgrade to an existing pump (mechanical or TMP) on load lock, or transfer or, and process chambers. On process chambers, a set of 8" MicroStar and 4" turbo-pump can often replace the traditional Cryo pump and therefore eliminate regeneration while providing MicroStar's high water vapor pumping speed and the turbo constant permanent gases speed.
Load locks present the greatest risk of introducing water into the chamber system. Water vapor can react with process gasses producing particulate or corrosive by-products reducing yields and damaging chamber components.
Removing water at this point, using a system containing the MicroStar Water Vapor Pump can:

- Provide favorable, consistent process conditions
- Reduce the risk of corrosive by-products
- Reduce the pump down time by up to 50%This can mean higher uptime and improved productivity

Standard Vacuum Flange

The MicroStar is available in all standard vacuum flanges types. It is also available without a flange for non-standard in situ applications.

High Speed Water Pumping

The cold panel is kept at 110K to 140K. At this temperature only water molecules are captured to a partial pressure as low as below 10-10 Torr. The temperature is user defined and could be set to a lower base temp in order to pump other condensable gasses.
Permanent gasses conductance is maximized thanks to optimized geometric design.

Unique, Fast & Safe Regeneration

In a unique patented process, the frequency of the Stirling engine is altered causing the thermodynamics of the system to change from cooling to heating. No other heat source is required to achieve full regeneration cycle in less than 40 minutes. As only water vapor is captured on the cold panel, the regeneration process does not release hazardous gasses in dangerous concentrations into the vacuum system. For extreme cases where regeneration fast cycle is a requirement, heaters can be added to expedite the cycle.

Ultra Low Vibrations Cooler Option

An ultra low vibration version of the pump is available for very sensitive applications. These may be detector cooling applications or other processes in which prior to MicroStar LN2 was the only available cooling option.

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Microstar In Line

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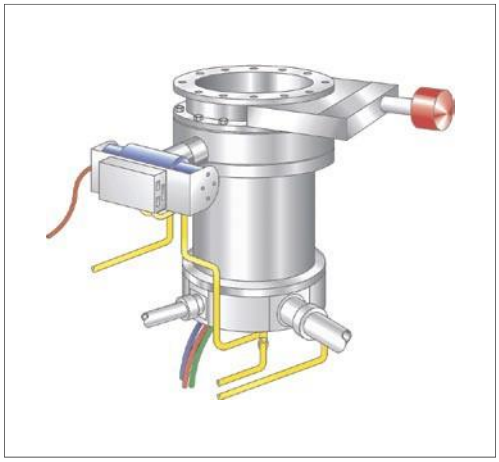
Example of Microstar connected to Turbo Pump



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In Situ Ready to Incorporate any Cryo Panel Design

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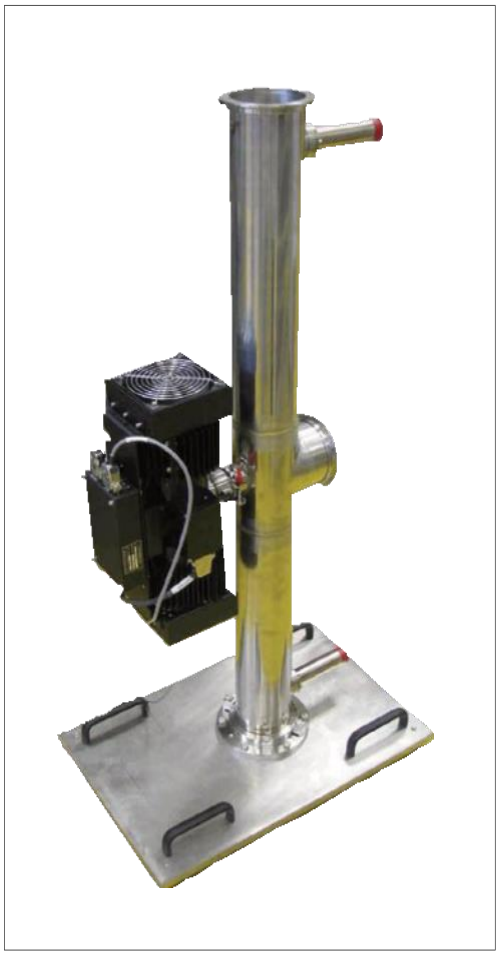
Example of Load lock Typical Installation



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In Situ Forced Air Cooled DN40CF Interface Flange

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Example of Microstar InSitu Typical Installation

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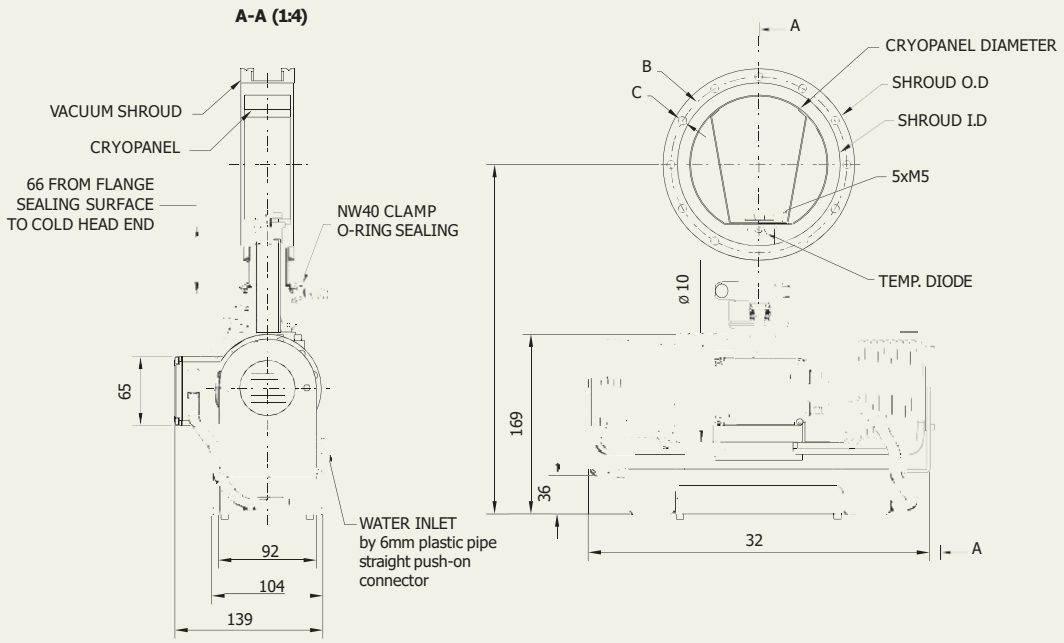
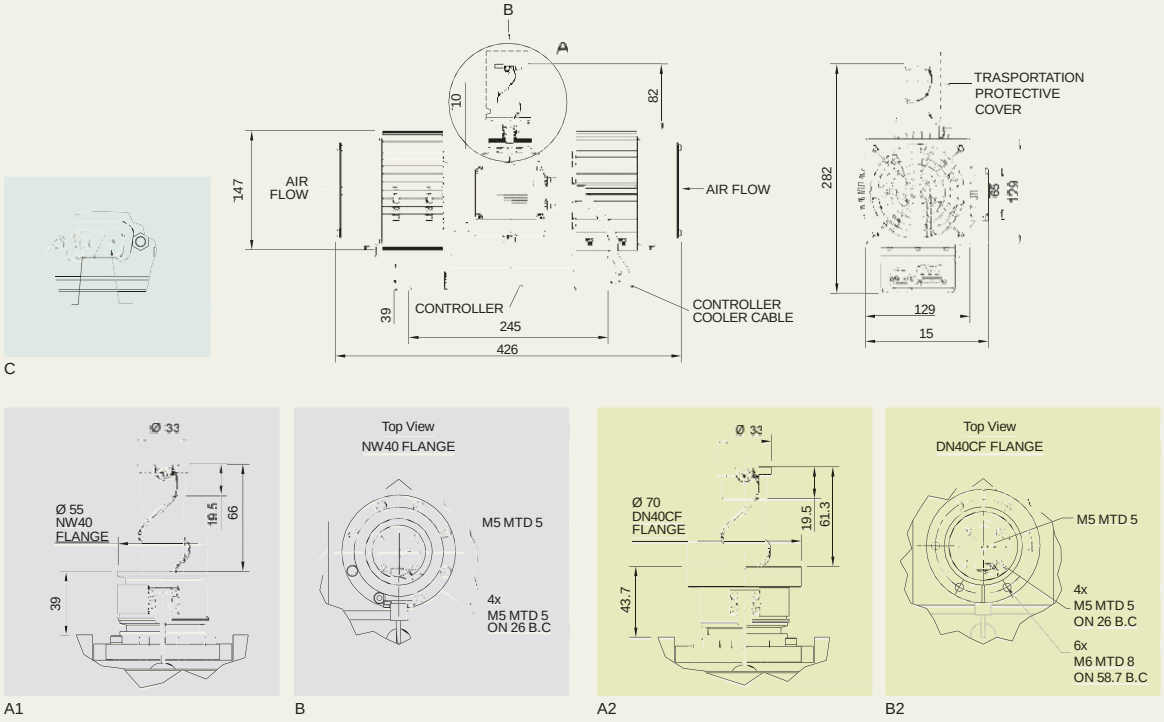
In Situ Version with special Cryo Panel



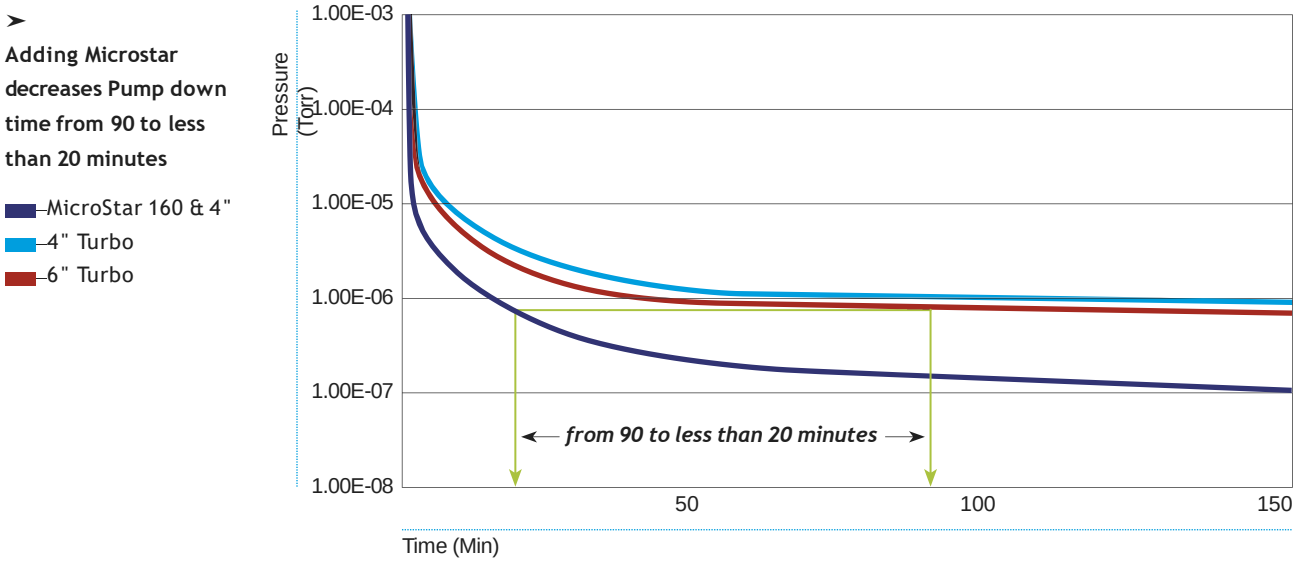
Microstar In Line Type Outline Dimensions (mm)

(See details on ordering info. table)



Microstar In Situ Type Outline Dimensions (mm)

➤ **Adding Microstar decreases Pump down time from 90 to less than 20 minutes**



➤ **Maximum Performance**

	ISO & CF 100	ISO & CF 160	ISO & CF 200
Water Vapor Pumping Speed ls^{-1}	1,000	2,000	4,000
Air (N2) Conductance Speed ls^{-1}	700	3,500	10,000

➤ **Ordering Information**

ORDERING P/N	TYPE	VACUUM SHROUD O.D.	VACUUM SHROUD I.D.	CRYOPANEL DIAMETER	H	B*	C* No. and size of bores
B53401000	In-Situ Pump	KF-40 Interface Flange					
B53401200	ISO100	130	103	93	303	ISO Claw Flanges	
B53401300	ISO160	180	153	130	323	ISO Claw Flanges	
B53401400	ISO200	240	213	190	355	ISO Claw Flanges	
B53401800	ISO250	290	261	236	383.3	ISO Claw Flanges	
B53401500	DN100CF	152	102	93	302	130.2	15 x Ø8.4
B53401600	DN160CF	202	153	130	323	181	19 x Ø8.4
B53401700	DN200CF	254	206	190	355	231.8	23 x Ø8.4
B53401450	ISO200F	285	213	190	355.5	260	12 x Ø11
B53401850	ISO250F	335	261	236	383.3	310	12 x Ø11.1

* for CF and ISO-F vacuum shrouds

other flanges dimensions and type are available upon request

Scope of Supply

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PART	P/N	DESCRIPTION	INCLUDED WITH MICROSTAR	INCLUDED WITH PSU
K535 PCU	235B002A	Parallel control unit for K535 cooler	√	—
Integrated Controller for K535	235C102A	Driver/Temp controller for K535 cooler	√	—
Power Supply Unit (PSU)	235C001A	K535 52VDC, power supply unit	—	√
Communication Cable 2.9m	235R300A	Communication cable for Nir-Or controller	√	—
PSU to Wall Electric Cable 2m	1P0754	IEC320 with bare ends	—	√
PSU to Controller Cable 2.7m	235R011A	PSU-Controller SDC power cable for K535	—	√
Customer CD	737R050A	CD with LCC monitor software and user manual files	√	—
MicroStar Cooling Water Kit	737C010A	SST coils for cooling water	√	—

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MicroStar General Technical Data

Maximum Weight (including pump)	21 Kg (ISO250F configuration)
Cooling Power (a)	18W@120K (23ºC ambient temperature)
Cooling Power (b)	7W@65K (23ºC ambient temperature)
Power Consumption	200W max. 52VDC in normal operation
Water Cooling Consumption	2LPM @23ºC
MTTF	> 25,000 Hours
Helium Gas Pressure	16 to 20 Bar
Measured Noise Level	35 dB(A) from 5 meter distance
Self Induced Force (vibration)	20 Nrms at expander axis
	5 Nrms at motor axis
Operating Temperature	0 to +50˚C (cooler body temperature)
Storage Temperature	-40 to +80˚C (cooler body temperature)
Humidity	10% to 90%
Altitude	-70 m to +3500 m relative to sea level

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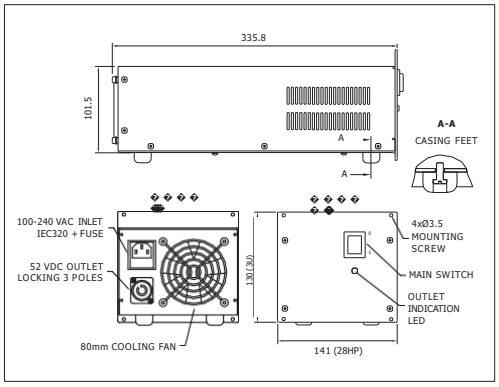
Power Supply Unit Outline Dimensions (mm)

This PSU is compatible for rack mount by simply dismantling the casing feet



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Power Supply Unit General Technical Data

Input Voltage	100-240VAC full range
Input Frequency	47-63Hz
Input Current	8A at 90VAC full load
Output Voltage	52 ± 2VDC
Output Current	10.7A ± 5%
Efficiency	70% minimum. (at 230V full load)
Operating Temp	0° to 50°C environment
Cooling	Air-Cooled
Weight	Maximum 2.6Kg

Contact Details

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