

LIO 5P a bench top ... a flexible choice

Almost all laboratory freeze-drying processes can be carried out using this basic unit and the wide range of accessories available.

The LIO5P 4K incorporates a stainless steel cooled trap that can be easily accessed for cleaning and allows a large number of corrosive products to be freeze-dried in complete safety.

Moreover this unit, in combination with nXDS range pumps*, turn out to be particularly suitable for freeze drying with presence of aggressive chemical agents like solvents, acids etc., and for any heavy requirements of the chemical laboratory.

The LIO5P is available in two version, the Base Unit LIO5P-4K and the Low Temperature LIO5P-LT.

CHARACTERISTICS

- **Extremely easy to use**
- **Temperature condenser -55 °C (4K) or -90 °C (LT)**
- **Stainless steel condenser**
- **Touch Screen Microprocessor with vacuum and digital temperature indication**
- **Additional PT100 temperature sensor for product temperature control**
- **RS232 as standard**
- **Wide range of accessories**
- **Software for parameters printing on require**
- **Compact size**
- **Easy to connect to any vacuum pump suitable for freeze-drying processes**

The LIO5P is a low cost unit designed primarily for freeze-drying, but it is equally suitable for use in other vacuum applications where a low temperature condenser is required. The basic unit consists of a cabinet containing the refrigerating compressor with air cooling, the stainless steel condensation chamber and the control instrumentation

Designed to be installed on laboratory benches, it has flanges for connecting accessories in a suitable position. The corrosion-resistant, stainless steel condenser is thermally insulated and acts as a trap for water vapour or other types of solvent. The large flanged access at the top allows easy inspection, cleaning and defrosting.

The front part of the unit contains:

- a drain valve for simple quick removal of condensate
- a Nw16 fitting for connection to a suitable dual-stage oil rotary vacuum pump or a scroll pump**
- Touch screen microprocessor .

Customised accessories are available for drying materials in bulk or in flasks, vials or bottles as well as for drying small biological samples.

* Edwards oil free patented Scroll Pump

** The scroll pump has suitable to pump vapor or solvents as the nXDS does.



PLC Control Touch-Screen



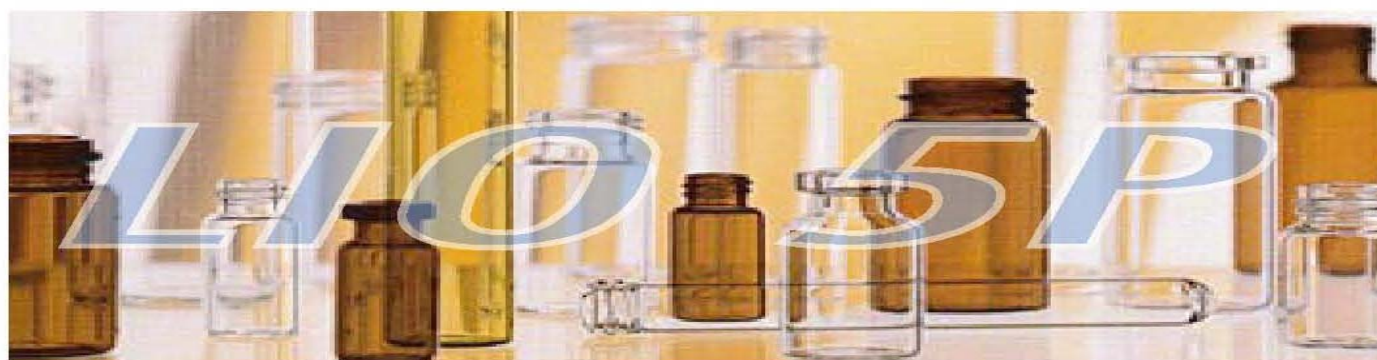
LIO-5P Basic Unit



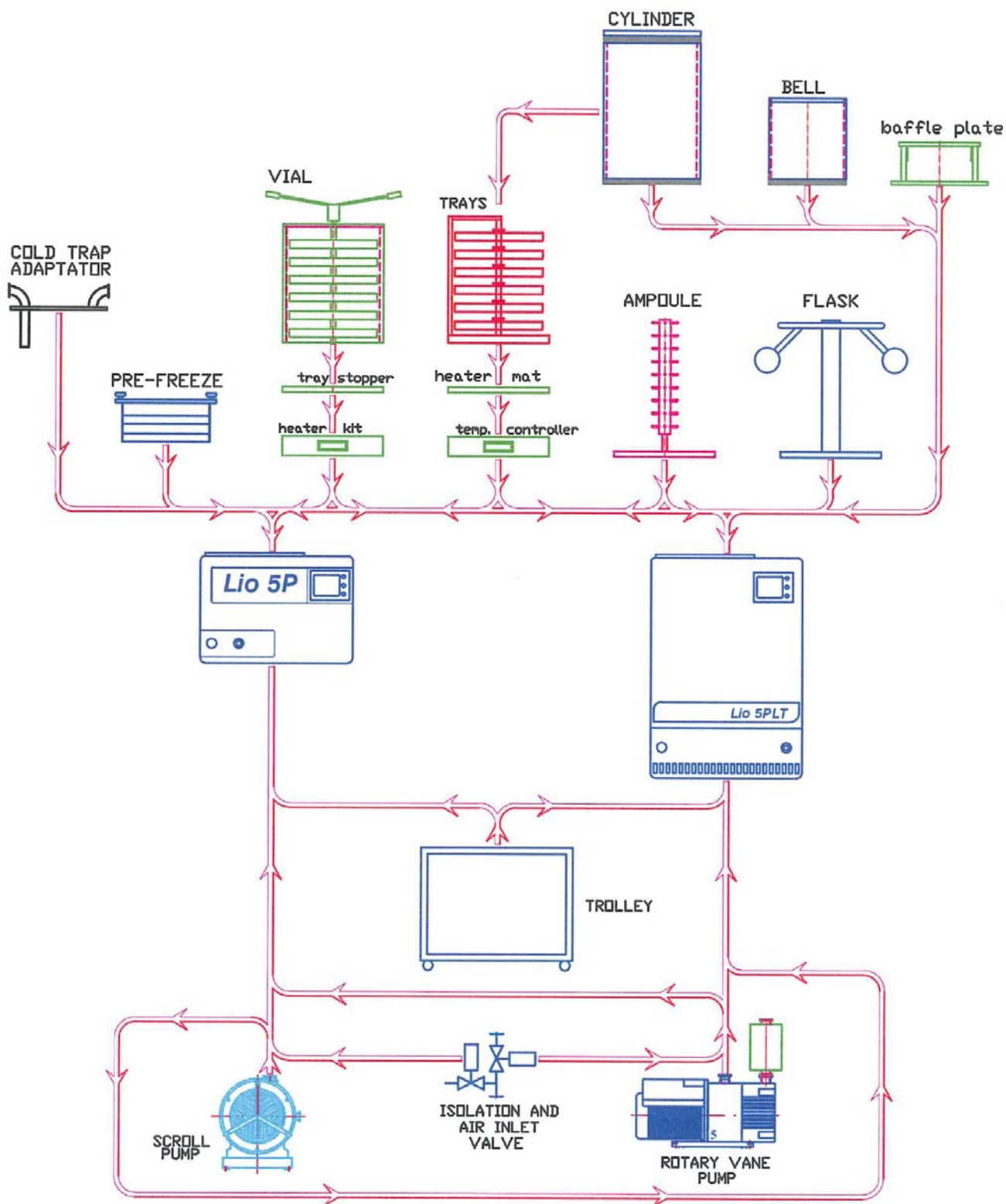
LIO-5P LT

Technical Data

General	LIO5P 4K	LIO5P LT
Dimensions (H x W x D)	330 x 470 x 640 mm	680 x 470 x 640 mm
Mass	45 Kg.	65 Kg.
Cover enclosure rating	IP22	IP22
Operating temperature range	da + 5°C a + 27°C	da + 5°C a + 27°C
Max storage temperature	+ 50°C	+ 50°C
Noise level	< 50 db(A)	< 50 db(A)
Cooling system performance		
Ice condenser capacity	4 Kg.	4 Kg.
Max ice capacity	2,4 Kg. (24 hours)	2,4 Kg. (24 hours)
Minimum condenser temperature	- 50°C ± 3°C	- 100°C ± 3°C
Condensing surface	0,15 m ²	0,15 m ²
Instrumentation		
Controls and display	Touchscreen + connection RS232	Touchscreen + connection RS232
Temperature readout with sensor	Sonde PT100 (- 70°C + 100°C)	Sonde PT100 (- 70°C + 100°C)
Vacuum gauge	Sensor Pirani (1000-10-3 mbar)	Sensor Pirani (1000-10-3 mbar)
Refrigeration system		
Compressor	1/3 HP hermetic unit	1/3 HP hermetic unit
Gas type	R404A	R404A
Compressor type	182ST605 Danfoss	182ST605 Danfoss
Gas Charge	0,6 Kg.	0,6 Kg.
Electrical data		
Power supply	220/240V, 1 ph, 50 Hz	220/240V, 1 ph, 50 Hz
Installed power	0,5 kW	1 kW
Internal / external protection rating	fuse 10A	fuse 10A
Construction materials		
Enclosure	Powder coated carbon steel sheet	Powder coated carbon steel sheet
Front/control panel	PVC	PVC
Condenser body	Aisi 304 Stainless Steel	Aisi 304 Stainless Steel
Vacuum line	PVC	PVC
Extension vacuum line pipe	Aisi 304 Stainless Steel	Aisi 304 Stainless Steel
Vacuum pump minimal performance (with LIO 5P used as freeze dryer)		
Pump type	Double stage rotary vane or scroll pump	Double stage rotary vane or scroll pump
Ultimate vacuum	better than 0,01 mbar	better than 0,01 mbar
Pumping speed	Rotary pump 5/8 mc/h Scroll Pump 5/10 mc/h	Rotary pump 5/8 mc/h Scroll Pump 5/10 mc/h
Other services requested	gas ballast	gas ballast



LIO 5P 4K & LT ...



... Accessories

UNIT

LIO5P 4K basic unit	LIO5P0000
LIO5P LT low temperature	LIO5P0001
LIO5P Connection kit	LIO5P0005
LIO5P Isolation valve + air inlet kit	LIO5P0006
LIO5P Trolley	LIO5P0007

PUMPS

RV5 vacuum oil pump + Oil Mist Filter	LIO5P0002
RV8 vacuum oil pump + Oil Mist Filter	LIO5P0003
RV12 vacuum oil pump + Oil Mist Filter	LIO5P0004
nXDS5 dry vacuum pump	LIO5P0008
nXDS10 dry vacuum pump	LIO5P0009
nXDS15 dry vacuum pump	LIO5P0010

FLASK

Column manifold complete with 8 rubber valve	LIO5P1000
Rubber valve	LIO5P1001
Cone adapter	LIO5P1002
Column manifold nude	LIO5P1003
Column "L" seal	LIO5P1004

TRAYS

Acrylic cylinder with lid (Ø 300 h=430)	LIO5P3000
Tray Ø 270	LIO5P3005
Product shelves (6 max.)	LIO5P3006
Heater mat (6 max.)	LIO5P3007
Temperature controller	LIO5P3008
Flask adaptor complete with 8 valves	LIO5P3009

ROTARY PUMPS



EDWARDS

SCROLL PUMPS



EDWARDS



Bulk trays and support frame



Multi shelf stoppering device



Acrylic bell assembly (Ø 300 h=430)



Moulded tray for stoppering device

VIAL

Stoppering device	LIO5P2000
Trays for stoppering device (8 max.)	LIO5P2001
Heater kit	LIO5P2002
Stoppering device chamber "L" seal	LIO5P2003

AMPOULE

Ampoule devices complete	LIO5P4000
Ampoule devices "L" seal	LIO5P1004

CHAMBERS

Acrylic cylinder with lid (Ø 300 h=430)	LIO5P3000
Acrylic cylinder (Ø 300 h=430)	LIO5P3001
Acrylic bell cover (Ø 300)	LIO5P3002
Acrylic bell L seal (Ø 300)	LIO5P3003
Baffle Plate (Ø 300)	LIO5P 3004
Acrylic bell (Ø 240 h=250)	LIO5P1010
Acrylic bell seal (Ø 240)	LIO5P1012
Baffle plate (Ø 240)	LIO5P1014

MISCELLANEOUS

Cod Trap Adaptor	LIO5P0011
Product pre-freeze accessory	LIO5P0012

LIO 5P Shelf Freeze-Dryers Range

CINQUEPASCAL's LIO range shelf freeze-dryer is especially designed for very flexible and reproducible production cycles, with full operational, product and environmental safety combined with maximum reliability and an extended operational life. All CINQUEPASCAL systems are designed so as to facilitate work operations and user access.

These freeze-dryers basically consists of a drying chamber containing one, two or more product shelves with a system of cooling, achieved through a direct expansion refrigerating circuit, and heating through sinking an electrical resistance operating at a safety voltage of 24 V in the two plates, a vacuum pumping unit, a vapour condenser, a PLC control panel for regulation and safety devices. The fields in which these freeze-dryers are normally used are:

- Research - the units are used for a general application. Many products are dried in a wide range of containers by many researchers in series of projects that are not essentially correlated. Typical customers are hospitals, Universities and Research Laboratories.
- Production - in this case very easy handling is required to manage a single product or a small number of products in a continuous and regular manner. The main considerations are: low cost per unit of area, reliable and easy to uses. Typical users are small companies operating in the Biotechnology field.
- Pilot - in this case the units are used to collect information. The information required concerns both the product (formulation) and the machine (cycle optimization, simulation of performance of industrial units for large-scale productions). Sometimes it can be used for the production of small batches for clinical trials. The products used will tend to be similar, perhaps slightly different in the formulation, and an attempt will be made to use the system for a single project. Typical users are pharmaceutical industry research and development department

The standard range consists of 4 base units in two versions: the standard with condenser down to -55°C and the low temperature version able to reach -90°C .

- Special - Cinquepascal realized customized solutions for special applications such as dehydration books, or geological specimens, however special machines on user requirements



Freeze dryer developed for the Local Environmental Agency .

It is used for studies and analysis of slices of trees in polluted soils

LIO5P 4K superlight compatible with the
"Sherpas's shoulders" climbing in Himalayas.



LIO 5P 1000/2000



LIO 5P 4000/8000



TECHNICAL DATA

Power supply and consumption	1000	2000
Power Supply	220 V 50 Hz	
Installed power	2,4 KW	2,6 KW
Compressed air (for isolation valve)	(4-6 bar)	

Specifications

Total shelf area	0,1m ²	0,2 m ²
Number of shelves 1 2		
Shelf dimension mm. (LxDxW)	310x310x20	
Shelf interdistance mm.	125	75
Shelf termoregulation range	-40°C ÷ +40°C	
Condensator capacity	6 Kg. Ice	
Min. operational condenser temp.	-55°C	
Temperature measurement range	-60°C ÷ 100°C	
Pressure measurement range	0,001÷100mbar	
Max. capacity of vials Ø13=620, Ø15=460, Ø20=255 (LIO1000)		
Max. capacity of vials Ø13=1240, Ø15=920, Ø20=510 (LIO2000)		
Max. bulk capacity: (depends on load thickness)		

Materials and fluids used

Chamber	AISI304 (Uni X5 Cr Ni 1810)
Condenser	AISI304 (Uni X5 Cr Ni 1810)
Product shelf	Al (Uni 3579 P Al Cu Mg Mn)
Shelf details	Teflon (pure PTFE)
Chamber Door	Perspex (Polymetacrylatodimethyl)
Chamber Door OR seal	Silicon
Vacuum OR seal	Nitrile
Refrigerant fluid	Freon R404
Rotary pump oil	Oil Edwards Ultragrade 19 or 70
PLC with 9 presetted cycles plus 1 in manual	

Dimensions and weight	1000	2000
Overall dimensions mm. (WxHxD)	880 x 1500 x 750	
Total weight	250 Kg	270 Kg

Accessories code

Basic unit LIO 1000P	5PA-MIN 001
Basic unit LIO 2000P	5PA-MIN 002
LIO5P 1000 stoppering system	5PA-MIN 011
LIO5P 2000 stoppering system	5PA-MIN 012
Calibrated leak system	5PA-MIN 020
Chamber / condenser isolating valve	5PA-MIN 030
Tray for bulk	5PA-MIN 031
Loading & transfer tray	5PA-MIN 032
EMF10 filter assembly on pump discharge	5PA-MIN 040
Vacuum pump additional Pirani sensor assembly	5PA-MIN 041
4 channel cycle printer	5PA-MIN 050

Option

- Low temperature version
- Dry pump

TECHNICAL DATA

Power supply and consumption	4000	8000
Power Supply	380 V 3 Ph 50 Hz	
Installed power	3,6 KW	4,0 KW
Compressed air (for isolation valve)	(4-6 bar)	

Specifications

Total shelf area	0,46 m ²	0,92 m ²
Number of shelves 1 2		
Shelf dimension mm. (LxDxW)	650x700x20	
Shelf interdistance mm.	160	80
Shelf termoregulation range	-40°C ÷ +40°C	
Condensator capacity	8 Kg. Ice	
Min. operational condenser temp.	-55°C	
Temperature measurement range	-60°C ÷ 100°C	
Pressure measurement range	0,001÷100mbar	
Max. capacity of vials Ø13=3020, Ø16=1970, Ø23=920 (LIO4000)		
Max. capacity of vials Ø13=6040, Ø16=3940, Ø20=1840 (LIO8000)		
Max. bulk capacity: (depends on load thickness)		

Materials and fluids used

Chamber	AISI304 (Uni X5 Cr Ni 1810)
Condenser	AISI304 (Uni X5 Cr Ni 1810)
Product shelf	Al (Uni 3579 P Al Cu Mg Mn)
Shelf details	Teflon (pure PTFE)
Chamber Door	Perspex (Polymetacrylatodimethyl)
Chamber Door OR seal	Silicon
Vacuum OR seal	Nitrile
Refrigerant fluid	Freon R404
Rotary pump oil	Oil Edwards Ultragrade 19 or 70
PLC with 9 presetted cycles plus 1 in manual	

Dimensions and weight	4000	8000
Overall dimensions mm. (WxHxD)	880 x 1500 x 750	
Total weight	370Kg	400 Kg

Accessories code

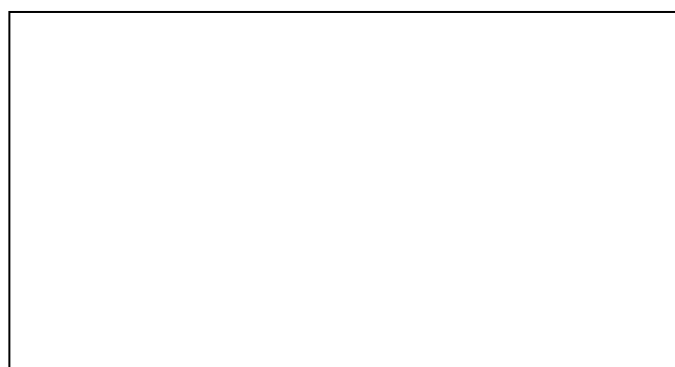
Basic unit LIO 4000P	5PA-PNS 001
Basic unit LIO 8000P	5PA-PNS-002
LIO5P 4000 stoppering system	5PA-PNS 011
LIO5P 8000 stoppering system	5PA-PNS 012
Calibrated leak system	5PA-PNS 020
Chamber / condenser isolating valve	5PA-PNS 030
Tray for bulk	5PA-PNS 031
Loading & transfer tray	5PA-PNS 032
EMF10 filter assembly on pump discharge	5PA-MIN 040
Vacuum pump additional Pirani sensor assembly	5PA-MIN 041
4 channel cycle printer	5PA-MIN 050

Option

- Low temperature version
- Dry pump

LIO 5P Series

Unit	LIO5P 4K	LIO5P 4KLT	LIO5P 1000	LIO5P 2000	LIO5P 4000	LIO5P 8000
External Dimensions mm	470x330x630	470x600x650	880x1500x750	880x1500x750	1400x1600x1000	1400x1600x1000
Shelf Area m ²	-----	-----	0,1	0,2	0,45	0,91
Shelf Dimensions mm	-----	-----	310x310	310x310	650x700	650x700
Number of shelves	-----	-----	1	2	1	2
Shelves temperature °C	-----	-----	-40 ÷ +40	-40 ÷ +40	-40 ÷ +40	-40 ÷ +40
Condensing capacity Kg	2,5	2,5	6	6	8	18
Minimum Condensing Temperature °C	-55	-95	-55	-55	-55	-55
Temperature measuring range °C	-60 ÷ +100	-120 ÷ +100	-60 ÷ +100	-60 ÷ +100	-60 ÷ +100	-60 ÷ +100
Pressure Measuring range mbar	1000-10-3	1000-10-3	1000-10-3	1000-10-3	1000-10-3	1000-10-3
Power Kw	0,33	0,69	2,4	2,6	3,6	4
Voltage (+/- 10%), 50/60Hz, V	230	230	230	230	3x400	3x400
Control	PLC with Touch Screen		Programmable Controller and Automatic Process Control			
Procedure recording	PC connection (RS232)		Printer or connection to PC			
Low Temperature Versions Available On Request						



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 info@5pascal.it

Se le esigenze produttive sono maggiori i liofilizzatori della serie LIO 1000P, 2000P, 4000P e 8000P sono la soluzione ideale. Queste unità robuste e affidabili garantiscono un utilizzo pilota oppure piccole produzioni di liofilizzati. Lo schema costruttivo si differenzia dalla famiglia LIO-10P per lo sdoppiamento delle unità frigorifere a singolo servizio sia sulle piastre che sul condensatore.

Liofilizzatori serie LIO-1000P/2000P



DATI TECNICI

Alimentazione e consumi	1000	2000
Alimentazione	220 V 50 Hz	
Potenza installata	2,4 KW	2,6 KW
Aria compressa (per valv. Isolamento)	(4-6 bar)	
Specifiche		
Superficie di carico	0,1m ²	0,2m ²
Piastra di carico (n°.)	1	2
Dimensioni piastra mm. (LxPxS)	310x310x20	
Interdistanza piastre mm.	125	75
Range termoregolazione temp. piastre	-40°C ÷ +40°C	
Capacità condensatore	6 Kg. Ghiaccio	
Min. temp. operativa condensatore	-55°C	
Range di misura temperatura	-60°C ÷ 100°C	
Range di misura pressione	0,001 ÷ 100mbar	
Max. capacità flaconi Ø13=620, Ø15=460, Ø20=255	(LIO1000)	
Max. capacità flaconi Ø13=1240, Ø15=920, Ø20=510	(LIO2000)	
Max. carica in Bulk : (in funzione dello spess. del carico)		

Materiali e fluidi impiegati

Camera	AISI304 (Uni X5 Cr Ni 1810)
Condensatore	AISI304 (Uni X5 Cr Ni 1810)
Piastra Porta Prodotto	Al (Uni 3579 P Al Cu Mg Mn)
Particolari Piastra	Teflon (PTFE puro)
Porta	Perspex (Polimetacrilatodimetile)
OR Tenuta Porta	Silicone
OR Tenuta Vuoto	Nitrile
Fluido Refrigerante	Freon R404
Olio Pompa rotativa	Olio Edwards Ultragrade 19 o 70

Dimensioni e Peso	1000	2000
Dimensioni mm. (LxAxP)	880 x 1500 x 750	
Peso Totale	250 Kg	270 Kg

ACCESSORI

ACCESSORI	CODICE
Unità base LIO 1000P	5PA-MIN 001
Unità base LIO 2000P	5PA-MIN 002
Sistema per stoppering LIO 1000P	5PA-MIN 011
Sistema per stoppering LIO 2000P	5PA-MIN 012
Sistema per perdita calibrata	5PA-MIN 020
Valvola di isolamento camera / condensatore	5PA-MIN 030
Bacinella per bulk	5PA-MIN 031
Caricatore a trasferimento	5PA-MIN 032
Montaggio filtro EMF10 su scarico pompa	5PA-MIN 040
Montaggio sensore Pirani addizionale vuoto pompa	5PA-MIN 041
Stampante di ciclo 6 canali	5PA-MIN 050
Microprocessore gestione automatica ciclo LIO1000	5PA-MIN 061
Microprocessore gestione automatica ciclo LIO2000	5PA-MIN 062

Liofilizzatori serie LIO-4000P/8000P



DATI TECNICI

Alimentazione e consumi	4000	8000
Alimentazione	380 V 3 Ph 50 Hz	
Potenza installata	3,6 KW	4,0 KW
Aria compressa (per valv. Isolamento)	(4-6 bar)	
Specifiche		
Superficie di carico	0,46m ²	0,92m ²
Piastra di carico (n°.)	1	2
Dimensioni piastra mm. (LxPxS)	650x700x20	
Interdistanza piastre mm.	160	80
Range termoregolazione temp. piastre	-40°C ÷ +40°C	
Capacità condensatore	8 Kg. Ghiaccio	
Min. temp. operativa condensatore	-55°C	
Range di misura temperatura	-60°C ÷ 100°C	
Range di misura pressione	0,001 ÷ 100mbar	
Max. capacità flaconi Ø13=3020, Ø16=1970, Ø23=920	(LIO4000)	
Max. capacità flaconi Ø13=6040, Ø16=3940, Ø20=1840	(LIO8000)	
Max. carica in Bulk : (in funzione dello spess. del carico)		

Materiali e fluidi impiegati

Camera	AISI304 (Uni X5 Cr Ni 1810)
Condensatore	AISI304 (Uni X5 Cr Ni 1810)
Piastra Porta Prodotto	Al (Uni 3579 P Al Cu Mg Mn)
Particolari Piastra	Teflon (PTFE puro)
Porta	Perspex (Polimetacrilatodimetile)
OR Tenuta Porta	Silicone
OR Tenuta Vuoto	Nitrile
Fluido Refrigerante	Freon R404
Olio Pompa rotativa	Olio Edwards Ultragrade 19 o 70

Dimensioni e Peso	4000	8000
Dimensioni mm. (LxAxP)	880 x 1500 x 750	
Peso Totale	370Kg	400 Kg

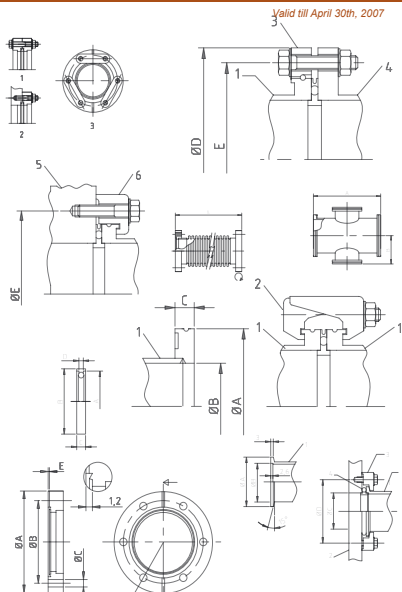
ACCESSORI

ACCESSORI	CODICE
Unità base LIO 4000P	5PA-PNS 001
Unità base LIO 8000P	5PA-PNS-002
Sistema per stoppering (pompa idraulica man.)	5PA-PNS 011
Sistema per perdita calibrata	5PA-PNS 020
Valvola di isolamento camera / condensatore	5PA-PNS 030
Bacinella per bulk	5PA-PNS 031
Caricatore a trasferimento	5PA-PNS 032
Montaggio filtro EMF10 su scarico pompa	5PA-MIN 040
Montaggio sensore Pirani addizionale vuoto pompa	5PA-MIN 041
Stampante di ciclo 6 canali	5PA-MIN 050
Microprocessore gestione automatica ciclo LIO1000	5PA-MIN 061
Microprocessore gestione automatica ciclo LIO2000	5PA-MIN 062

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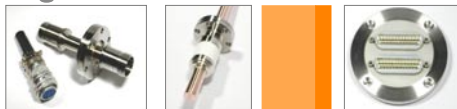
Flange Fittings



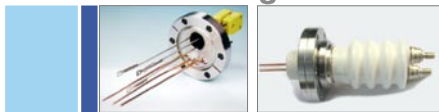
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5Pascal

high and ultra



high vacuum



feedthroughs and components

2006

Liofilizzatore da laboratorio



LIO-5P 4k

e accessori

.....i nostri cataloghi

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www.5pascal.it

5Pascal

LABORATORY PRODUCTS

- Vacuum pumps, water jet pumps, diaphragm pumps
- Flange Fittings, fluids, sealants and greases
- Vacuum systems valves
- Vacuum instrumentation
- Laboratory freeze dryers
- Vacuum ovens & dryers
- Special Vacuum Systems



E' difficile immaginare un campo di applicazioni più vasto di quello della tecnologia del Vuoto. Praticamente non vi è settore di mercato che non utilizzi una pompa da vuoto, oppure faccia uso di un impianto dove in qualche misura il vuoto sia indispensabile. Cinquepascal realizza impianti custom dedicati utilizzando il Vuoto, piccoli liofilizzatori da laboratorio e componenti speciali.

Cinquepascal, il primo centro SIT accreditato per le basse pressioni, fa propri i bisogni di chi necessita di qualità in breve tempo, offrendo un rapido servizio di taratura SIT all'industria per quanto concerne la certificazione di strumenti da vuoto ed esegue anche tarature (non SIT) presso le sedi dei propri clienti.

Dal 1999, Cinquepascal è distributore esclusivo BOC Edwards per i Centri di Ricerca e per le Università in Italia, commercializzandone la componentistica e la strumentazione da vuoto, fornendo servizio di assistenza sui prodotti BOC Edwards e di consulenza nell'ambito della tecnologia del vuoto

Partners internazionali: Boc Edwards, ARS, Johnsen Ultravac, Ricor, LK Technologies, Organic Spintronics, Applied Surface Thecnologies.

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