



## D-95 DIGITAL VACUUM PUMPS

Code 1.9513.00



## MANUAL

June 2024

Marked



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# VACUUM PUMP

## With digital vacuum indicator



### MODEL D-95

Code 1.9513.00-Flow rate 15L/min. Maximum vacuum  $-0.86 \pm 2\%$  bar-Maximum pressure 2 bar

## 1- GENERAL INTRODUCTION

The following considerations are intended to ensure proper reception, use of the device, and user safety. We recommend reading this manual before unpacking the device and subsequent use.

- This manual must be kept permanently within reach of the user of the equipment.
- Carefully unpack the device, checking the contents. Notify any incident.
- Do not install in areas with corrosive atmospheres or exposed to liquid splashes.
- Avoid using the device if there is the possibility of generating explosive and flammable gas mixtures.
- According to European regulation 89/655/EEC, the lack of adequate maintenance, alteration of any component, exempts the manufacturer from any responsibility for any damage that may occur.
- The devices sent to *DINKO* must be perfectly **clean and disinfected**. Otherwise, they will be rejected and returned with shipping at the expense of the owner.

## 2- PACKING LIST

The Pumps are supplied complete with the following elements:

Network connection cable 230V 50Hz  
Connector for external control  
Warranty  
Silicone vacuum tube 5x10mm, 1 meter.  
Manual.

### 3- GENERAL DESCRIPTION

*DINKO* vacuum pumps are membrane pumps. On its front panel there are vacuum and pressure nozzles, a digital vacuum indicator and vacuum regulator control.

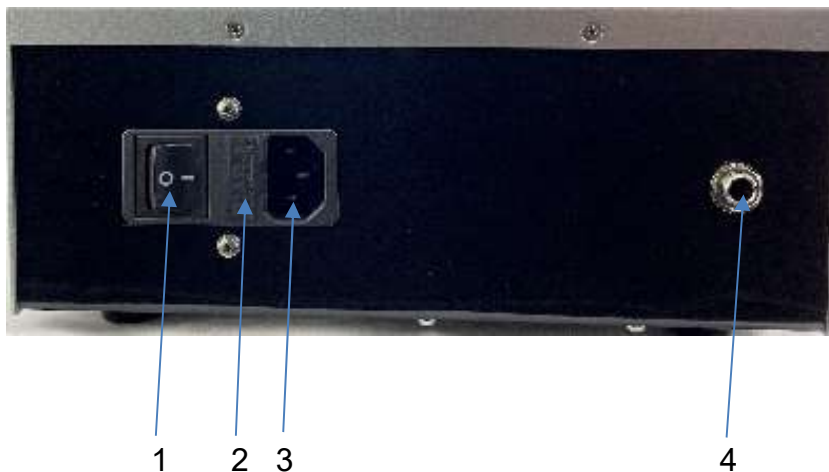
The membranes are made of FPM ® material and the pump head is made of PPS / PRIMEF ® (polyphenylene sulfide ) containing fiberglass, which makes them more resistant to acids and solvents.

#### 2.1 Front view



- 1- Green start-up light
- 2- Vacuum regulating needle valve
- 3- Digital vacuum indicator
- 4- Air inlet, vacuum connection
- 5- Air outlet, pressure connection

#### 2.2 Rear view



- 1- Start switch
- 2- Fuse holder
- 3- Connection for the power cable
- 4- Connection for external contact (pedal, PLC, etc.)

## 4- COMMISSIONING AND CONTROL

Check that the start switch (1) is in position O

Connect the power cable to the equipment and to the power supply at 230V AC 50Hz

Install the silicone tube to the suction nozzle



Press the rear main switch, close the silicone tube with a clamp or by hand and turn the adjustment knob completely to the right.

The digital indicator will indicate the maximum vacuum reached by the pump in bars (factory selected unit in bar).

If the connector for external control is inserted into the connection after this effect, the motor will stop, but not the indicator, which will continue to indicate the existing vacuum, otherwise the pump loses vacuum.

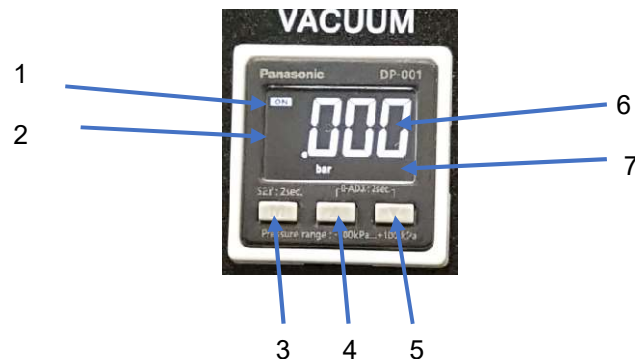
Release the clamp on the silicone tube and the vacuum indicator should indicate a vacuum of 0.00. Otherwise, consult the “Auto - zero” section.

Removing the rear connector will start the pump motor and if the silicone tube is closed again it will signal the vacuum generated by the pump.

**Below you will find the manual for the digital indicator. Read it carefully and before touching the programming, go to the section where you will find the factory programming with which the equipment is delivered.**

## 5- DIGITAL VACUUM INDICATOR

### 5.1 Keyboard Description



- 1- Exit indicator activated
- 2- Lock indicator
- 3- **M** Selection key
- 4- Up key ▲
- 5- Down key ▼
- 6- Vacuum indicator display
- 7- Vacuum unit's indicator display

## 6- SETTING

The vacuum gauge is factory configured to work in vacuum units in bars with a range between 0.00 and -1.000 bar.

It is also locked at the factory, so it is not possible to modify the parameters without unlocking it.

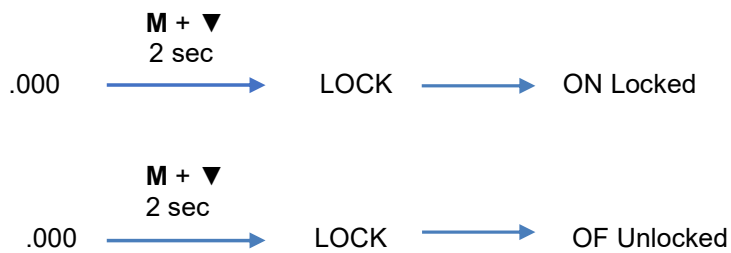
## 7- LOCK/UNLOCK

The indicator is factory programmed in a blocked situation.

To lock or unlock the indicator:

With the external connector installed, when you start the equipment, the indicator will light, but the motor will not run.

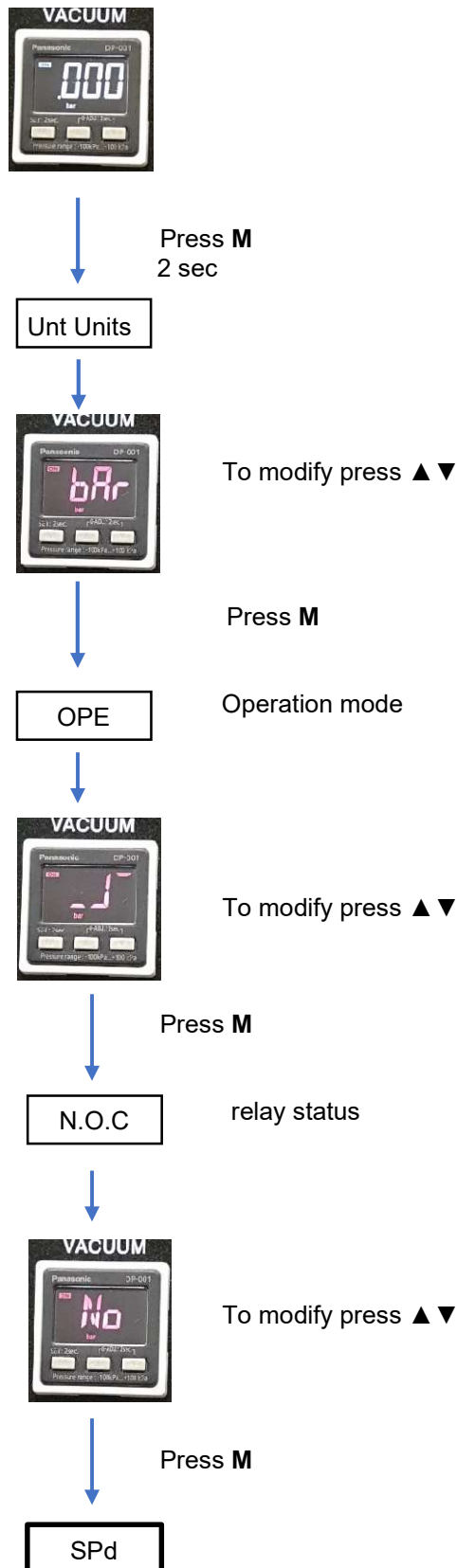
Simultaneously press **M** and **▼** for 2 seconds and LOCK-OFF will appear and it will be unlocked, or LOCK-ON and it will be locked. Indicated on the screen with an open or closed bolt (2)

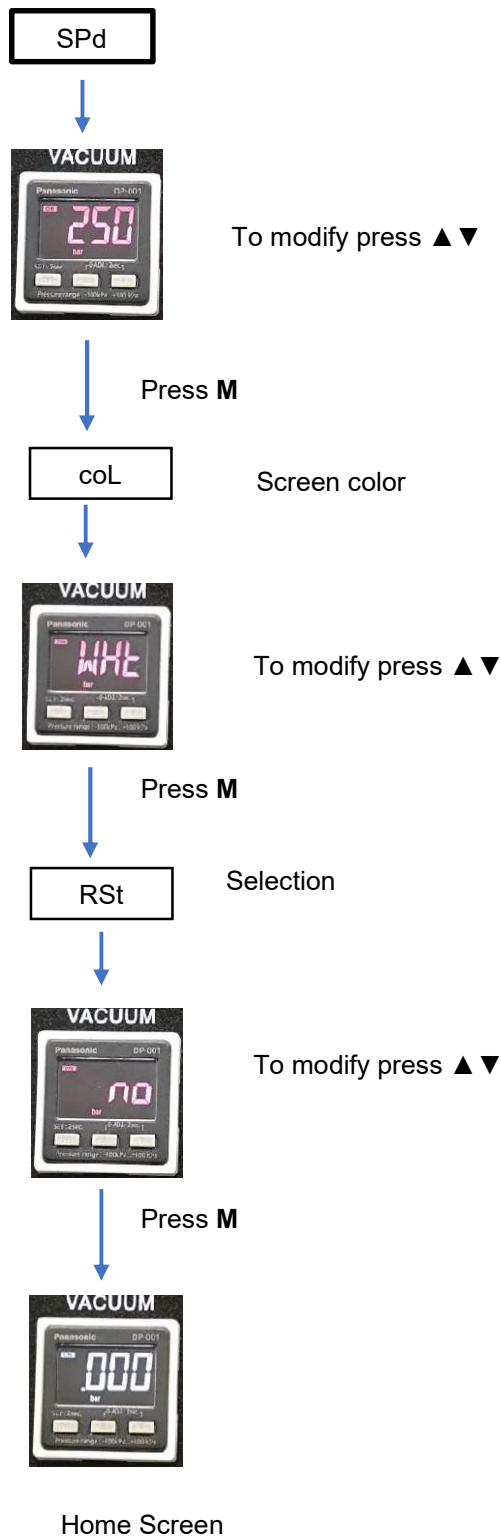


## 8- PROGRAMMING

The digital indicator is programmed at the factory. **It is advisable not to modify these parameters.** To view it, with the pump connected and the external connector installed in its base, press **M** for 2 seconds to obtain the following succession of screens

Home Screen





The programming shown in the previous configuration is the most indicated and it is preferable not to modify it.

The indicator is factory programmed to work between 0.000 and -1.000 bar.



## 9- VACUUM REGULATION

With the pump connected to the system under vacuum and the regulation knob “2” completely closed (turning it clockwise), the vacuum indicator will show the maximum vacuum reached by the system.

If you want to adjust to a lower range, turn the adjustment knob “2” slowly to the left, until the desired vacuum is reached.

## 10-AUTO - ZERO

To adjust the zero value “0”

On the back of the pump there is a connection for external control.  
The corresponding connector is included with the pump.

To set the value to “0”, insert the connector into the rear connection with the pump off.  
Then start the pump, the motor will remain stopped and the indicator will show a value of “0” or close to it.

To make the adjustment, press ▲ ▼ simultaneously and Auto Zero will be performed automatically.

Remove the rear connector and the motor will start.

## 11-ERROR INDICATORS

Mistake	Cause	Correction
E..1	The load is shorted causing over current	Remove power and check charge
E..3	Adjusts by applying pressure during zero adjustment	Do not apply pressure to the pressure port: the pressure should be equal to atmospheric pressure. Repeat zero adjustment.
-10.10	External inlet is outside the rated pressure range	The applicable pressure range must be readjusted to be within the rated pressure range.
--10.10	The applied pressure is above the lower limit of the displayed pressure range.	

## 12- BOARDS

Data of interest based on the relationship: Vacuum gauge reading = Atmospheric pressure – residual pressure

The following usefulness equivalences can be established

from...to	Da	kPa	MPa	Kgf /cm <sup>2</sup>	mmHg	psi	bar	In Hg	mm H <sub>2</sub> O
1Pa	1	0.001	0.000001	0.000010197	0.00750062	0.000145038	0.00001	0.0002593	0.101968
1kPa	1000.000	1	0.001000	0.010197	7.500616	0.145038	0.010000	0.2953	101.9689
1MPa	1000000	1000	1	10.197	7500.616	145.038	10	295.2998	101968.9
1 kgf /cm <sup>2</sup>	98066.5	98.0665	0.0980665	1	735.559	14.2233	0.980665	28.95979	10000.20
1mmHg	133.32	0.1332	0.000133	0.0013595	1	0.019336	0.0013332	0.039370	13.5954
1psi	6895	6.895	0.006895	0.07031	51.7157	1	0.06895	2.036074	703.07
1 bar	100000.0	100.0000	0.100000	1.01972	750.062	14.5038	1	29.52998	10196.89
in Hg	3386.388	3.386388	0.003386	0.034530	25.40000	0.491141	0.033863	1	345.324
1mm H <sub>2</sub> O	9.80665	0.00980		0.000099	0.0735578	0.00142	0.000098	0.002895	1

The indicator's Pascal readings are displayed in Mega Pascals.

Vacuum correction table by altitude (meters). Equivalent to 760 mm Hg at sea level.

-1,000bar = 760mmHg

Altitude	mmHg
300	733
400	724
500	716
600	707
700	699
800	690
900	682
1000	674
1100	665
1200	657
1300	649
1400	642
1500	634
1600	626
1700	618
1800	611
1900	603
2000	596
2100	588
2200	581
2300	574
2400	567
2500	560
2600	553
2700	546
2800	539
2900	532
3000	525

## 13- EXTERNAL CONNECTION OPERATION

Using the connector supplied with the pump, any system (PLC, etc.) that activates the pump's relay control can be connected.

You can also connect a pedal that will operate the pump when stepped on. When you connect the pedal, the pump will remain stopped. By pressing the pedal permanently, the pump will work and will stop when you release the pedal.

Order pedal separately. Code 1.9740.00

## 14-ACCESSORIES

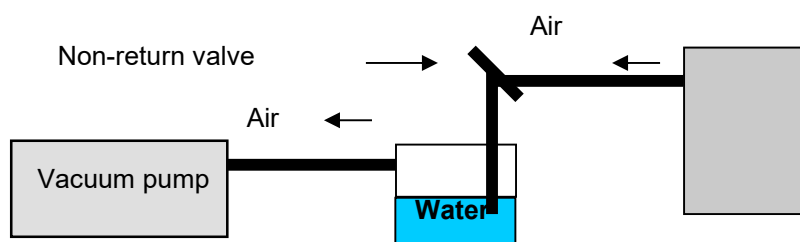
Codes	Description
1.9740.00	Foot switch (pedal)
1.9520.00	Vacuum trap with 1L bottle, tubes and non-return valve

### 14.1 Vacuum trap installation diagram

In those cases, in which there is production of annoying vapors that are harmful to people, or harmful to the integrity and duration of the pump membranes and valves, it is advisable to install a retention trap.

The generation of sticky substances or the possible presence of solid particles are also reasons for this installation.

The trap is supplied with the code 1.9520.00



Trap bottle Vacuum system

## 15-SPECIFICATIONS

Code	empty bar	Pressure bar	Flow rate L/min	Vacuum gauge	Regulator	Measurements cm	kg
1.9513.00	-0.86±2%	2	fifteen	(1)	Yes	24x27x10	4

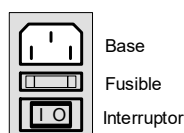
(1) Digital vacuum indicator.

## 16- ELECTRICAL POWER SUPPLY

230V AC 50Hz. 1Amp fuse.

## 17- CHANGING FUSES

The fuse holder box is part of the power supply base located at the back of the pump. See Figure. Pry with a screwdriver between the central part of the fuse holder box and the top part of the power supply base to remove the fuse holder box. The box remains attached without being completely removed. There are two fuses. Press the box inwards to restore its original position. Remember to replace the fuse used.



## 18-MAINTENANCE-SPARE PARTS



Before proceeding with any examination or repair of the device, it is necessary to disconnect the mains socket. All initiatives must be carried out by qualified personnel to avoid greater harm.

Entrust your device to a technical service authorized by *DINKO Instruments*.

*DINKO* vacuum pumps do not require maintenance, as they have self-ventilated magnetic induction motors that work dry. They are not affected by liquid reabsorption, but if this occurs and vacuum is lost, it will be necessary to disassemble the head and proceed to clean the membranes and valves. Alternatively, cleaning can be attempted by injecting pressurized air through the vacuum nozzle. Avoid the entry of air containing sticky substances since these will remain inside the pump, shortening the life of the membrane and internal valves. In these cases, protection filters or a vacuum trap can be inserted.

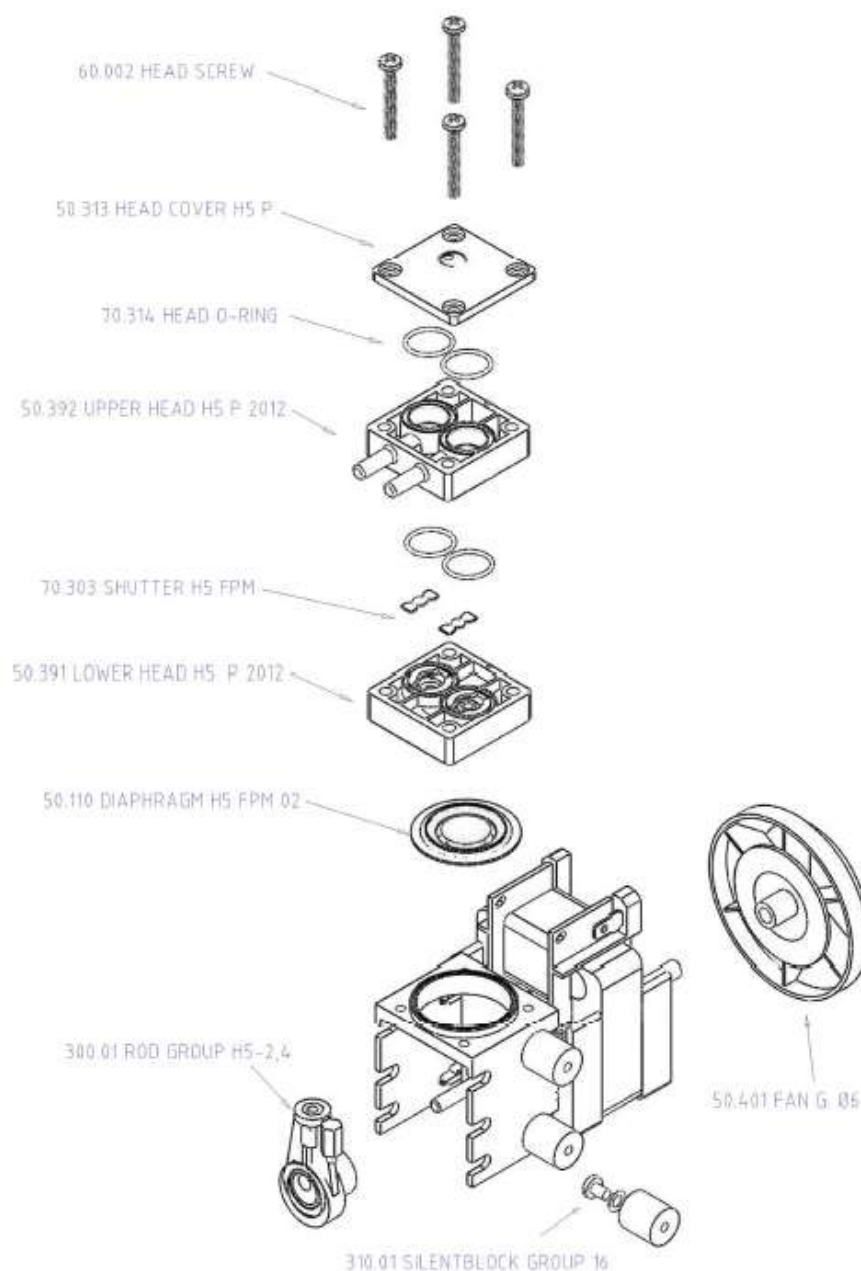
### Code Description

1.0005.03	Mains connection base with fuse holder and ON/OFF switch
1.0060.13	Circuit for vacuum indicator.
1.0033.02	External connector
1.9518.26	Digital display
1.0070.26*	Rubber set
1.0070.10	Motor
1.8738.01	Silicone vacuum tube 5x10mm, 1meter
1.0072.01	Vacuum regulation valve.

\* Pump 1.9513.00 mounts 2 sets of rubber

## 19-DIAGRAMM

Pumps 1.9513.00



### Note of interest:

Disposal of waste electrical and electronic equipment by users within the European Union.

This symbol on the product or packaging indicates that it cannot be disposed of as household waste. You must dispose of your residual equipment by handing it over to the collection agency for the recycling of electrical and electronic equipment. For more information about recycling this equipment, contact your local office, the store where you purchased the equipment, or your household waste disposal service. Recycling materials helps conserve natural resources and ensure that they are recycled in a way that protects human health and the environment.

## 20-ANOMALIES

The pump does not seem to give the expected vacuum:

- a) There may be an entry of air into the vacuum chamber.
- b) Disconnect the pump from the system, turn the vacuum regulation knob completely to the right and close the suction nozzle with your finger.

The pump vacuum gauge should indicate the maximum usual vacuum of the pump. If not, the membrane or internal valves have deteriorated and need to be changed or require cleaning.

Inject pressurized air through the suction nozzle to expel any dirt that has penetrated inside the pump.

If it is not solved, go to technical service or request a replacement. See spare parts and diagrams section.

- c) In the case of liquid filtration and with the pump connected to the vacuum device, the vacuum gauge on the front panel should indicate the usual maximum vacuum of the pump, just at the moment of placing the liquid to be filtered.

If not, there is no air tightness and air enters the system. Check connections, etc. Otherwise, go to technical service or request spare parts. See spare parts and diagrams section.

- d) See the table of vacuum equivalences due to altitude. The higher the altitude, the lower the vacuum.  
674mm Hg at 1000 meters altitude is equivalent to 760mm Hg at sea level.

- e) The previous recommendations have been taken into account but the filtering is not carried out or takes too long.

e-1) Not done: you need a Pump that obtains more vacuum.

e-2) Not performed: the pump creates sufficient vacuum but does not filter. The pore size of the filter may be too small and become clogged. Make 2 or 3 filters instead of just one, starting with a larger pore size than recommended to eliminate even larger particles that clog very small pore filters. Using larger diameter funnels and filters will help.

e-3) It takes too long. The vacuum system is very large and requires a pump that evacuates air more quickly.

e-4) It takes too long. The vacuum system is not very large. Use larger diameter filters, for example 90mm.

## 21- WARRANTY

### Duration:

The warranty is established for a period of 1 year from the date of commissioning of the device as long as the warranty card is returned to us within 8 days following said commissioning.  
Without this condition the guarantee will not be valid.

### Scope of warranty:

The guarantee is given against manufacturing and material defects for an average of 40 hours of work per week. The guarantee is reduced proportionally to the increase in working hours.  
Repairs will be carried out in our factory. Otherwise, the warranty will only include the replacement of defective elements.

*DINKO* will not be responsible for transportation costs, nor will it assume responsibility for the consequences caused by the immobilization of the device.

The free replaced parts remain our property, reserving the right to request their return, free of shipping to our home.

Repairs or replacement of parts during the warranty period do not extend the initial warranty.

Our liability is limited to the attached warranty and not to possible accidents to people or other things. Any alteration of the device by the user voids the warranty.

## 22-“CE” DECLARATION OF CONFORMITY

DINTER SA

*DINKO* Instruments . c/ Encarnació , 123-125 / 08024 - Barcelona

Declares that the articles mentioned in the attached list, to which this declaration refers, comply with the essential safety requirements of the applicable European Directive:

- Low Voltage Directive, Directive D2014/35/EU of February 26, 2014 and applicable since 2016 in accordance with the recommendations of the LVD Directive.

- Essential requirements of Annex I of the Machinery Directive 2006/42/EEC of May 17, 2006.

- EC electromagnetic compatibility relative to the Electromagnetic Compatibility Directive 2014/30/EU in accordance with EMC recommendations.

-Safety for electrical measurement, control and laboratory devices. Requirements relating to EMF. EN 61326

- Safety rules for electrical measurement, control and laboratory devices. Part I.  
General regulations EN 61010-1

However, the user must observe the assembly and connection instructions indicated in the technical instruction catalogues.

Name:

Joan A. Bravo

Josep X. Sensada

Post:

Technical director

Quality manager

Signature



Model: D-95 Vacuum Pump

## **OTHER DINKO APPARATUS**

- Blenders-Homogenizers
  - Colorimeters
- Conductivity meters
- Extractor for meat analysis
  - Heating Plates
  - Infrared ovens
- Kits for water analysis
  - Magnetic Stirrers.
- Metallic Block Heaters
  - Microscopes
  - Nephelometers
  - Orbital Shakers
  - Oxygen Meters
- Peristaltic pumps
  - pH-meters
  - Photometers
  - Respirometers
  - Rod Stirrers
  - Rotary Stirrers
  - Sand Baths
- Spectrophotometers
- Temperature Controllers
  - Timers
- TriquiVisor - Trichinoscope
  - Turbidimeters
  - Turn Dishes
- Vacuum Pumps