



VARIABLE FLOW PERISTALTIC PUMPS

Model D-21V

Codes 1.9730.06 / 1.9730.29 and 1.9730.31



MANUAL

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DINTER^{as}

c/ Encarnació , 123 -125. Tel. +34 93 284 69 62. Fax +34 93 210 43 07

e-mail: dinter@dinko.es

www.dinko.es 08024-Barcelona

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1- GENERAL INTRODUCTION

Peristaltic pumps pump all kinds of liquid substances without coming into contact with the mechanical elements as occurs in other pumps.

They are simple to use and require minimal maintenance costs.

The pumped substance is propelled inside an elastic tube thanks to the vacuum generated by a set of rotors that successively press and release the surface of the tube.

The liquid passes directly from its container to another without any contamination, avoiding recoil when the pump is stopped since the tube is pressed by the roller.

The nature of some corrosive substances or other characteristics that prevent the use of conventional pumps make peristaltic pumps especially useful for the transfer or dispensing of such substances.

Flow rates are obtained from 0,1 ml/minute to 2000 ml/minute.

A large number of tubes or hoses of different sizes are available made of materials resistant to various conflicting substances.

2- PACKING LIST

Item	Code	Quantity
Peristaltic Pump D-21	1.9730.06 or 1.9730.29 or 1.9730.31	1
Connections set		1
Power cable		1

3- RECEPTION

To guarantee correct reception, use of the device, and the safety of the user, we recommend reading this manual in detail before proceeding to unpack the device and subsequent use and especially the following points:

3.1- THE MANUAL

This manual must be kept permanently within reach of the user of the equipment.

3.2- UNPACKING

Carefully unpack the device, checking that the contents match the packing list. Immediately notify any eventuality.

3.3-EXPLOSIVE MIXTURES

Avoid using the device when there is the possibility of generating explosive gas mixtures and flammable.

The ATEX Directive is not contemplated.

3.4-RESPONSIBILITY






In accordance with European usage regulations 89/655/EEC, the lack of adequate maintenance and the alteration or change of any component, exempts the manufacturer from any responsibility for the damage that could occur.

3.5-REPAIRS

The devices to be sent to DINKO technical services *must* be **clean and disinfected**. Otherwise they will be rejected and returned with shipping at the expense of the owner.

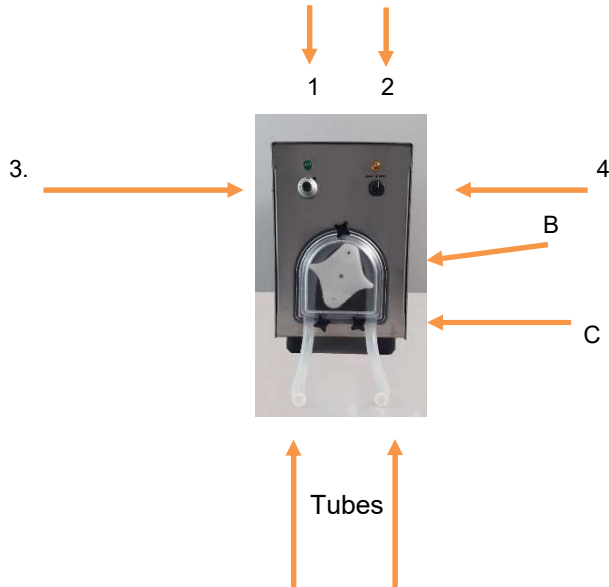
3.6-SIGNS AND SYMBOLS

Pay attention at all times to the danger warning signs and symbols that appear in this manual or on labels attached to the body of the Pump such as those shown below.

SIGN/SYMBOL	INTERPRETATION-MEANING
	Avoid contact of fingers with moving parts
	Danger-Risk-Caution
Before opening DISCONNECT the network cable Before removing cover PULL-OUT plug 	Before accessing the interior of the Pump, disconnect the power cable from the mains.
	Possible overheating - Do not touch
230V AC 50/60Hz	AC supply voltage
110V AC 60Hz	AC supply voltage
12V DC	DC supply voltage
	Disposal of waste electrical and electronic equipment by users within the European Union. It is not disposable as household waste. Deliver to the agency for recycling electronic equipment. Contact your local office, the store where you purchased the equipment or your household waste disposal service. Recycling helps conserve natural resources. Recycle protecting human health and the environment.

4- DESCRIPTION

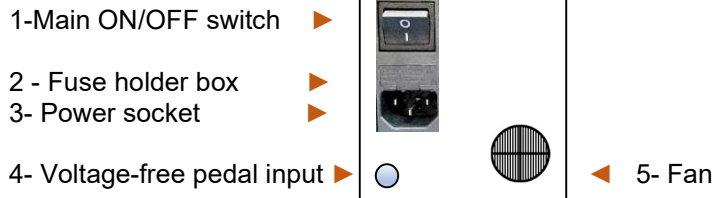
4-1 DESCRIPTION OF THE FRONT PANEL WITH 1500-2r HEAD



- 1- Green pilot light for network connection indicator
- 2- Yellow pilot light operating indicator
- 3- Speed regulation dial potentiometer
- 4- Rotation direction selector ←, → and stop.

- B- Peristaltic pump head
- C- Peristaltic tube connectors.

4-2 BACK PANEL DESCRIPTION

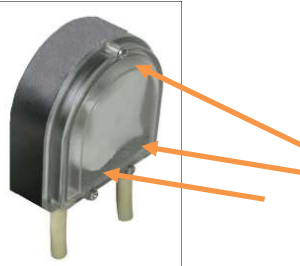


5- HEAD DESCRIPTION

The D-21V peristaltic pumps allow access to the tube for extraction when it needs to be replaced.

The cover is removed by extracting the three retaining knobs.

They allow two sizes of tube which, combined with the electronic speed regulation, gives a variety of flows, as can be seen in the table. On the back they have a connection for a foot switch or remote control.



Wings for fixing the lid and tubes

6- SPECIFICATIONS

6.1 Dimensions: 160 x305 x 255mm. Width x depth x height.

Weight: 5 Kg.

Operation: 100...240V 50/60Hz. 0.5Am p / 12V DC in Pump 1.9730.06

6.2 FLOW TABLE - Indicative regulation intervals for each tube, ml/min

Code ▼	rpm	6.4	8.0	◀ Tube Ø internal mm
1.9730.31	110	60-560	130-680	Flow rate ml/min
1.9730.29	330	190-1700	400-2000	
1.9730.06*				

The indicated flows are approximate and refer to liquids with a viscosity similar to water under normal conditions and without outlet back pressure. * With connection for car battery

7- START UP

7.1 Pumps at 100...240V 50/60 Hz

Install the peristaltic tube, see TUBING CHANGE section.

Make sure that the mains voltage is adequate. See back label with voltage data.

Connect the power cable to the rear plug and to the mains.

Press the ON switch.

Speed Control command allows continuous regulation of the motor speed.

7.2 Engine speed limitation

Because the friction of the tubes with the rollers increases with the diameter of the tubes, the minimum adjustable speed increases the larger the tube.

It is not advisable to use the lowest adjustable speed observed, even if the motor starts, since at any moment it can stop and cause the regulation circuit to overheat, which could break down if it remains in this situation for a long time. Choose a speed slightly higher than the minimum observed. Lightly smearing the tubes with silicone grease favors starting at lower revolutions and prolongs their life. Silicone grease, 50g. Code 8.0030.03

In installations for processes or assemblies that include a *DINKO Pump*, they must not be put into service before verifying that the safety standards of the European Machinery Directive 2006/42/EC are met!

8- ORDERING INFORMATION

Code ▼	Description
1.9730.31	D-21V pump with 1500-2r head, 110rpm, 100...240V 50/60Hz
1.9730.29	D-21V pump with 1500-2r head, 330rpm, 100...240V 50/60Hz
1.9730.06	D-21V pump with 1500-2r head, 330rpm, 12V DC, battery connector car and carrying handle
1.9740.01	Foot switch (pedal).
1.8119.00	Cyclic timer, stop and run times: 0.01 seconds to 99.99 hours

9- MAINTENANCE-SPARE PARTS

9.1 Before proceeding with any repair on 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*.



9.2 The engine and block do not require lubrication, so they are maintenance-free. rotor bearings They are self-lubricating but it is advisable to lightly lubricate them along with the roller and the tube with grease.
silicone from time to time, especially if you have washed your hair

9.3 Spare parts

<u>Replacement</u>	<u>Code</u>
Pump head base 1500	1.0078.12
Pump head 1500-2r complete	1.0078.11
Flow direction and stop switch	1.0015.05
Power supply 24V DC	1.8093.21
Fuse 2Amp	1.0005.07
Gearmotor 110rpm, 24V DC	1.0080.13
Gear motor 330rpm, 24V DC	1.0080.01
Pedal, foot switch	1.9740.01
Rotor 1500-2r	1.0078.21
Pump head front cover 1500-2r.	1.0078.13

10 -COMPLEMENTS

10.1 Scale for calibration of flow rates and dosages.

Reproducibility 0,1 g. Capacity 600g. Code 1.9812.02



To measure the dosed quantity in the Calibration process of peristaltic pumps, it is very effective to use a precision scale with digital reading.

If the liquid to be pumped has a density of "1" there will be no difference between grams and milliliters. Otherwise, calculate the density by weighing a quantity of the liquid with the help of a test tube, for example, 25 ml, previously weighing the test tube on the balance.

Divide the weight indicated on the digital reader of the scale in grams by the milliliters contained in the test tube to obtain the density according to the relationship,

$$D = M / V.$$

There is always the option to Calibrate the pump directly based on weight instead of volume.

Characteristics:

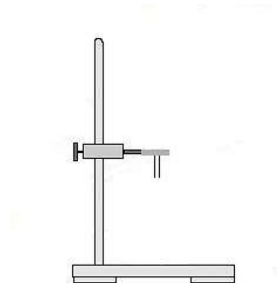
- ◆ Mono digital reading plate, with highly visible backlit LCD screen.
- ◆ Easy use and great robustness with ABS casing and airtight, moisture-proof membrane keyboard
 - ◆ Stainless steel plate, 157x128mm
 - ◆ External auto calibration
 - ◆ Measurement units: grams, pounds and ounces
- ◆ Continuous tare up to 600 g
- ◆ Power supply 230V 50/60Hz
- ◆ Non-slip rubber feet
- ◆ Working temperature: from +5°C to +40°C. Maximum use humidity, 85% RH

10.2 Graduated cylinder, 25 ml. Code 1.9808.20

10.3 Silicone Grease, 50g. Lubrication of peristaltic tubes. Code 8.0030.03

10.4 Foot support. Code 1.8003.08

Useful as a support for the dosing tube/tip. Foot: 150 x 70cm. Bar, height 70cm. Sliding support for dispensing tip.



CONNECTORS FOR PERISTALTIC TUBES

10.5 Reducing Connectors - Splice/Equal Ends, Polypropylene



For tubes with 1.6/3.2 mm ID. Code 1.0080.15
For tubes with 3.2/4.8 mm ID. Code 1.0080.18
For tubes with 4.8/6.4 mm ID. Code 1.0080.05
For tubes with 6.4/8 mm ID. Code 1.0080.14
For 8/12.7mm ID tubes. Code 1.0080.20

10.6 Straight connector for splice/reducer, polypropylene



Straight connector / reducer Ø 4-5-8 to 7-10-12mm. Light 1.6/4.6mm. Code 1.0120.31

10.7 Y-shaped connectors, polypropylene



Y shape connector, 6mm. either. Code 1.0120.26
Y shape connector, 8mm. either. Code 1.0120.48
Y shape connector, 10mm. either. Code 1.0120.32
Y shape connector, 12mm. either. Code 1.0120.33

10.8 316 stainless steel tube connectors - Splicing and dosage

Straight splice 40 mm length

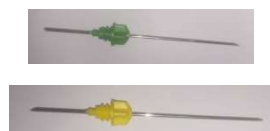


Tube for peristaltic tubes 0.5 and 0.8 mm Ø, 25 Units. Code 8.0056.14
Tube for peristaltic tubes 1.6 mm Ø, 25 Units. Code 8.0056.06
Tube for peristaltic tubes 3.2 mm Ø, 25 Units. Code 8.0056.08
Tube for peristaltic tubes 4.8 mm Ø, 25 Units. Code 8.0056.10
Tube for peristaltic tubes 6.4 mm Ø, 25 Units. Code 8.0056.12

Dosing 130 mm length with a bevel

Dosing tube for peristaltic tubes 0.5 and 0.8 mm Ø, 10 Units. Code 8.0056.15
Dosing tube for peristaltic tubes 1.6 mm Ø, 10 Units. Code 8.0056.07
Dosing tube for peristaltic tubes 3.2 mm Ø, 10 Units. Code 8.0056.09
Dosing tube for peristaltic tubes 4.8 mm Ø, 10 Units. Code 8.0056.11
Dosing tube for peristaltic tubes 6.4 mm Ø, 10 Units. Code 8.0056.13

Length 38mm



Micro-tube 0.8 mm OD, 10 unit. Code 1.0077.23
Micro-tube 0.9 mm OD, 10 unit. Code 1.0077.26

Clamping flange P. Code 1.0120.01

Clamping flange G. Code 1.0120.12

10.9 Anti floats 304 stainless steel for suction tubes



For peristaltic tubes with 1.6 and 3.2 mm ID. Code 1.0303.10
For peristaltic tubes with 4.8 mm. ID. Code 1.0303.11
For peristaltic tubes with 6.4 mm. ID. Code 1.0303.12
For peristaltic tubes with 8.0 mm. ID. Code 1.0303.13
For peristaltic tubes with 9.6 mm. ID. Code 1.0303.14
For peristaltic tubes with 12.7 mm. ID. Code 1.0303.15

10.10: Stainless steel dosing tubes with non-return valve

For 3.2 and 4.8 mm ID. tubes. Stainless steel tip 4 mm OD, 1mm TW. Code 1.0302.10
For 4.8 and 6.4 mm ID. tubes. Stainless steel tip 6 mm OD, 1mm TW. Code 1.0302.11
For 6.4 and 8.0 mm ID. tubes. Stainless steel tip 8 mm OD, 1mm TW. Code 1.0302.12
For 8.0 and 9.6 mm ID. tubes. Stainless steel tip 10 mm OD, 1mm TW. Code 1.0302.13



11- CHANGE OF TUBES

A set of medical/food grade silicone peristaltic tubes are supplied with each pump according to FDA and USP standards, autoclavable at 120°C, with peristaltic use range up to 80°C and medium duration. For industrial use, it is supplied with Tygon A-60-G tube. ®

The peristaltic quality of the tubes or rubbers consists of their ability to quickly recover their roundness once the rollers of the peristaltic head of the pump have compressed it to generate the circulation of liquids inside.

Furthermore, it must offer a minimum mechanical quality to overcome the wear caused by continuous compression of the rollers without losing its peristaltic capacity.

D-21 series pumps with 1500-2r head use tubes with a wall thickness calibrated at 2.4 mm. Greater thickness will seriously damage the motor shaft and less thickness will prevent the peristaltic function and the pump will not pump any liquid.

Thick liquids are best pumped with large tube diameters at low revolutions. In case of external connections it is better to use tubes with a larger diameter than that used in the header. The difference in height between supply and discharge always influences the performance of the pump and notably in thick liquids.

The pump feed and discharge tubes can have any wall thickness with an inside diameter as close as possible to that used in the head or larger, especially on the suction side.

The set of external tubes or connections must be as direct and straight as possible.

There is a range of rubbers that offer different chemical compatibilities with the products to be pumped.

The pump calibration must be updated every time the pump's working conditions are altered, such as changing tube, diameter or type of rubber, distances, new connections, etc.

Important: The head tubes should be lightly greased with silicone grease to extend their life and facilitate starting at low rpm. Silicone grease, 50g. Code 8.0030.03

Press the OF switch. Extract the tube according to the instructions described in the "Description" section. When removing the tube, do so together with its fixing terminals, if any. When the new tube is installed, it must be centered over the rollers to prevent the rotor from pinching it. Take advantage of the rotation of the rotor to introduce the new tube into the head. This avoids forcing the shaft when trying to place the tube with the rotor stopped. Put the lid back on.

In general, new tubes can lengthen during the first 30 minutes of operation. If this occurs, they must be tightened again to avoid unexpected breakage. To detect elongation or insufficient fixation of the tube to the head, it is useful to conveniently mark the tube with a marker.

1 1.1 AVAILABLE TUBES

PHARMA	Autoclavable multiple times. Sterilizable by ETO and Gamma. Food-medical grade, USP class VI, 21CFR 177.2600 and FDA. Not hemolytic. Excellent resistance to chemicals. ISO 10993. Low permeability and good abrasion resistance. Long duration. Use temperature, -51°C to 132°C . Beige.
SILICONE	Autoclavable . The most versatile tube. Platinum Cure quality silicone . Average duration. Medical/Food Grade. Excellent biocompatibility. Maximum temperature. 140°C. Translucent.
TYGON A-60-G ®	Autoclavable Compatible with Ozone, UV light and disinfectants . Great resistance to fatigue and abrasion. Resistant to acids, alkalis and alcohols. Use temperature -59°C to 135°C. Black color.
VITON ®	Autoclavable Suitable for acids and non- acetonic solvents . Maximum temperature 300°C. Black color

11.2 Consult the table of chemical incompatibilities between the type of rubber in the tubes and the substances pumped on our website www.dinko.es

11.3 Codes for calibrated tube with 2.4mm wall thickness, 1 meter

Codes for 2.4mm wall calibrated tube, 1 meter

▼ Internal Ø tube ►	6.4mm	8.0mm
PHARMA	1.8802.64	1.8802.80
SILICONE	1.8762.64	1.8762.80
TYGON A-60-G ®	1.8756.64	1.8756.80
VITON ®	1.8791.64	1.8791.80

12- FUSE CHANGE

The rifle holder is part of the power supply base located at the back of the bomb. See Figure.



Main ON/OFF switch

Fuse holder box

Connection for power cable

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.

13- TROUBLESHOOTING

The following table of faults, their causes and possible solutions, is not intended to cover all possibilities. However, user inconveniences that actually have easily avoidable causes can be avoided.

PROBLEM	CAUSE	SOLUTION
It doesn't start and the pilot lights don't come on.	Lack of food Blown fuse Unknown	Check cable and plugs Change fuse Request Technical Service
The head rotor does not rotate, but the pilot lights shine	Broken tube that prevents it defective engine	Change the tube Request Technical Service
The rotor turns, the tube is not broken, but it does not pump	Exhausted, worn tube Insufficient tube wall Empty feed tank Tube chemical incompatibility	Change tube Install proper tube Load deposit Choose suitable tube
Flow below theoretical	High viscosity Excessive pumping circuit Internal obstruction in the tube Insufficient tube wall High discharge back pressure Tube chemical incompatibility	Use a larger tube Ø Shorten circuit Clean Install proper tube Lower back pressure Choose suitable tube
Head tube moves	Small tube diameter Faulty tube installation	Choose a suitable tube Check the fixings

14- 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.

15- 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 D2006/95/EEC of December 12, 2006
- Essential requirements of Annex I of the Machinery Directive 2006/42/EEC of May 17 , 2006
- Electromagnetic compatibility EC relative to the Electromagnetic Compatibility Directive 2004/108/EEC of the December 15 , 2004
- Safety for electrical measurement, control and laboratory devices. EMC regulations. IN 61326
- Safety rules for electrical measurement, control and laboratory devices. Part I. Prescriptions general EN 61010-1

However, the user must observe the assembly and connection instructions indicated in the product catalogs. Technical instructions.

Name: Joan A. Bravo
Post: Technical director

Josep X. Sensada
Quality manager

Signature



D-21V Peristaltic Pumps

OTHER DINKO APPARATUS / OTHER DINKO APPARATUS

- Blenders-Homogenizers
 - Colorimeters
- Conductivity Meters
 - Dosing Pumps
- Extractor for meat analysis
 - Heating Plates
 - Infrared Stoves
- Kits for water analysis
- Magnetic Stirrers
- Metallic block heaters
 - Microscopes
 - Nephelometers
 - Orbital Shakers
 - Oximeters
- Peristaltic Pumps
 - pH-meters
 - Photometers
 - Respirometers
 - Rod Stirrers
 - Rotary Stirrers
 - Sand Baths
- Spectrophotometers
- Temperature Controllers
 - Timers / *Timers*
- Trichinoscope - TriquiVisor
 - Turbidity Meters
 - Turn dishes
 - Vacuum Pumps



DINTER, SA c/ Encarnació , 123-125. Tel. +34 93 284 69 62 Fax +34 93 210 43 07. 08024-Barcelona

dinter@dinko.es

www.dinko.es