VACUUM PUMPS D-95

Code 1.9515.15

MANUAL

May 2024

Marked CE

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VACUUM PUMP

MODEL D-95

Code 1.9515.15 - Flow 12 L/min. Maximum vacuum -0.98 ± 2% bar - Maximum pressure 2 bar

1- GENERAL INTRODUCTION

The following considerations try to guarantee a correct reception, use of the device, and the safety of the user. We recommend reading this manual before unpacking the device and subsequent use.

-This manual must be permanently kept within the equipment user's reach.

-Carefully unpack the appliance, checking the contents. Report any incident.

-Do not install in areas with corrosive atmospheres or exposed to liquid splashes.

-Avoid using the appliance if there is a possibility of generating explosive and flammable gas mixtures.

-According to European regulation 89/655/CEE, the lack of adequate maintenance, alteration of any component, exempts the manufacturer from any responsibility for the damages that could occur.

-The devices sent to *DINKO* must be perfectly **clean and disinfected.**
Otherwise, they will be rejected and returned with postage paid by the owner.

2- GENERAL DESCRIPTION

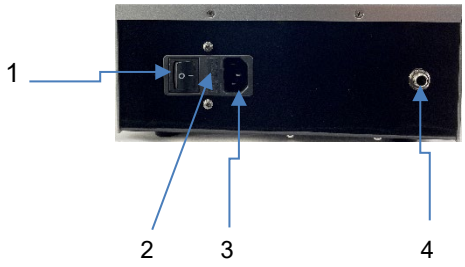
DINKO vacuum pumps are membrane. On its front panel are the vacuum and pressure nozzles, a digital vacuum controller, digital pressure indicator and vacuum regulator knob.

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- Vacuum gauge/controller
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.

3- PACKING LIST

The Pumps are supplied complete with the following elements:

Mains connection cable 110…230V AC 50/60Hz
Connector for external control
Silicone tube for vacuum 5x10mm, 1 meter.
Manual.

4- START-UP AND CONTROL

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

Connect the power cable to the equipment and to the 100…230V AC 50/60Hz power network.

Install the silicone tube to the squeegee.

Press the rear main switch, close the silicone tube with a clamp or by hand and turn the adjustment knob fully 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 in the connection behind the effect, the motor will stop, but not the indicator that will continue to mark the existing vacuum, if it is not that the pump loses vacuum.

Release the clamp on the silicone tubing 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 indicate the vacuum generated by the pump.

Below you will find the digital controller manual. 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.

Panasonic MANUAL

pressure sensor | High performance digital display

DP-102 series | For use outside of Japan

MEUML-DP100 V1.1

Thank you very much for purchasing Panasonic Electric Works SUNX products. Co., Ltd. Please read this Instruction Manual carefully for the correct and optimal use of this product. Carefully save this manual in a convenient place for quick reference.

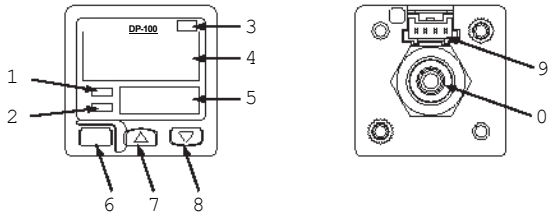
⚠ WARNING

- Never use this product as a security sensor for the protection of people
- In case of using sensors for the protection of persons, use products that comply with the laws and standards that are applicable in each region or country, such as OSHA, ANSI, IEC, etc
- The DP-100 series is designed for use with non-toxic gases. corrosive. It cannot be used with corrosive liquids or gases.
- Japanese Measurement Laws prohibit the use of this product. in Japan.

1 PRECAUTIONS

- This product has been developed and manufactured for use only industrial.
- Use the sensor within the nominal pressure range.
- Do not use pressure that exceeds the pressure resistance value. He diaphragm may be damaged causing malfunction.
- Do not apply power when wiring the sensor.
- Incorrect wiring can damage the sensor.
- Verify that the supply voltage with the ripple is maintained within of the range.
- If voltage is applied with a commercial power supply, make sure that the ground terminal (FG) of the source is connected to a reference to ground.
- In the event that noise-generating equipment, such as sources switches, variable speed drives, etc., are used near this sensor, connect the equipment ground terminal to a ground reference.
- Do not use the sensor during the transitory start-up time (0.5 sec.) after connecting the power supply.
- Do not install the cables inside the same conduit as the high voltage lines. voltage or power lines. It can cause a malfunction due to inductions.
- Specifications may not be met within a field strong magnetic.
- Avoid dust, dirt and steam.
- Take care that the sensor does not come into direct contact with water, oil, grease, organic solvents, etc.
- Do not insert cables etc. into the pressure port. The diaphragm can be damage causing malfunction.
- Do not press the keys with pointers or sharp objects.
- Do not sharply bend or pull hard directly on the joint of the wire to sensor.

2 PARTS

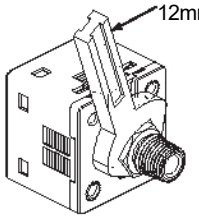


No.	Element	Description
1	indicator operation of the exit 1	Lights when the comparative output 1 is ON
2	indicator operation of the analog output in tension 2	• **Standard Model** : Lights up when comparative output 2 is ON • **Multifunction Model** : Turns on when the analog output in voltage is ON
3	display unit of pressur e	Depending on the model, "MPa" appears or "kPa". If another pressure unit is set, place the appropriate label, for example, psi. pub etc
4	main display	LCD display of 4 long characters.
5	secondary display	LCD display with 4 small characters.
6	selection key so	For more details, see the page 3, Section 8, MODE SELECTION OF OPERATION.
7	increment key	Increments the value being set.
8	decrease key	Decreases the value being set.
9	Male connector 4 pin	Refer to "Pin arrangement, 4-pin male connector" on the page 2.
0	pressure port	• DP-100 type: R1/8 + M5 female • Type DP-100-E: G1/8 + M5 female • Type DP-100-M: M5 female • Type DP-100-N: NPT1/8 + M5 female

3 TUBE CONNECTION

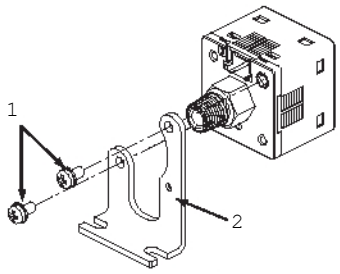
Use a 12mm wrench (14mm for the DP-100-E model) to place a commercial joint to the pressure port. The tightening torque should be 9.8 N or less (M5 female connector: 1N m or less). The section of the board or of the pressure port can be damaged if a tightening torque is applied excessive.

Apply a bead of sealant around the joint to prevent leaks.



4 ASSEMBLY

□ The mounting bracket (MS-DP1-1) is optional. When the sensor on mounting bracket, etc. the tightening torque should be less than 0.5N.



No.	Element	Description
1	M3 screw (6mm diameter, length) with nuts	MS-DP1-1 Accessories
2	Mounting bracket (MS-DP1-1)	Optional

□ MS-DP1-2 panel mount bracket is also available (optional) and MS-DP1-4 (optional) as well as the MS-DP1-3 cover (optional) and DPX-04 (optional).

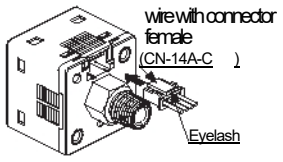
□ The type of cover depends on the mounting bracket. Use MS-DP1-3 for MS-DP1-2, and DPX-04 for MS-DP1-4.

□ To install the mounting bracket, refer to the Instruction Manual which is bundled with MS-DP1-2 or MS-DP1-4.

5 WIRING

connection method

Push in the female connector of the cable CN-14A- □ on the 4-pin male connector pins.

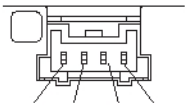


<Recommended product>
Contact: SPHD-001T-P0.5
Housing: PAP-04V-S
[JST Mfg. Co., Ltd.]

disconnection method

Pull the connector while pressing the eyelash.

Pinout, 4-pin male connector



No. Pin	Terminal
1	+V
2	comparative output 1
3	• Model Standard: Exit comparative 2 • Multifunction Model: Output analog voltage or input external
4	0V

6 I/O CIRCUIT DIAGRAMS

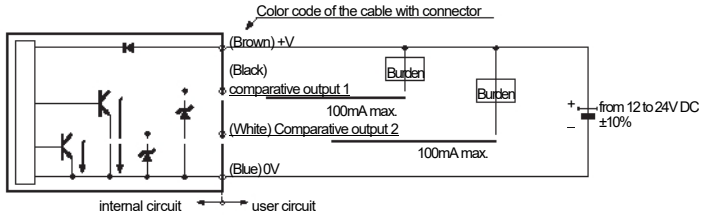
Grades :

□ When using the analog voltage output, take into account the input impedance of the connected device.

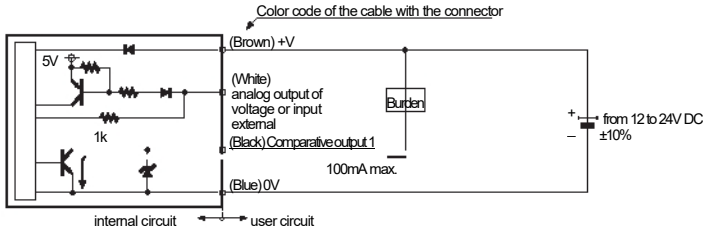
□ If the length of the cable increases, the resistance of the cable will cause a tension fall.

NPN output type

□ Standard Model

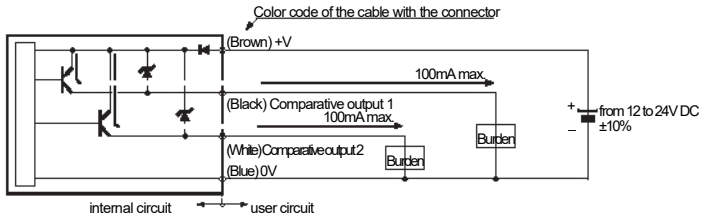


□ Multifunction model

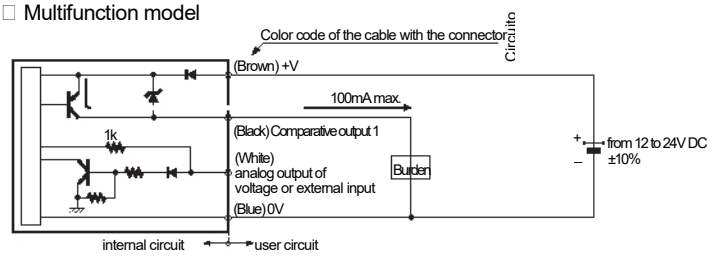


PNP output type

□ Standard Model



□ Multifunction model



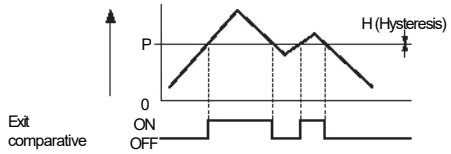
7 OUTPUT MODE AND OPERATION OF EXIT

EASY mode, hysteresis mode or window mode can be selected comparator as the output mode for comparative output 1 and, in the standard model DP-100, for comparative output 2.

For more details, see page 5, section 10, SETTING MODE.

EASY mode

The comparative output turns ON or OFF (depending on the NO/NC configuration) when the threshold value is reached. The tolerance of Threshold value is specified in the hysteresis setting. For more details, see page 6, section 11, PRO MODE.

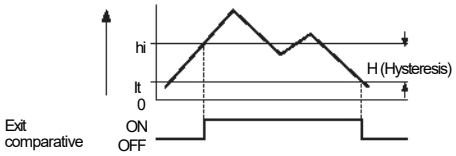


Grades :

- The hysteresis can be divided into 8 levels. For more details, see page 6, section 11, PRO MODE.
- P-1 shows comparative output 1 and P-2 for output comparison 2 on the secondary display.

Hysteresis mode

The comparative output turns ON or OFF (depending on the NO/NC configuration) when the upper threshold value is reached or lower and remains ON or OFF until the other threshold is reached.

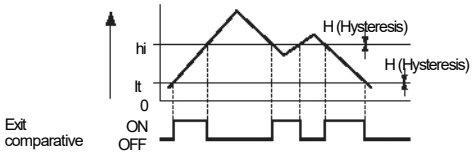


Grades :

- H (Hysteresis): 1 digit or more, 2 digits or more when select psi as the pressure unit.
- Hi-1 or Lo-1 shows the comparative output 1 and Hi-2 or Lo-2 for the comparative output 2 on the secondary display.

Comparator window mode

The comparative output turns ON or OFF (depending on the NO/NC configuration) when the pressure is between the threshold upper and lower. The threshold value tolerance is specified in the hysteresis setting. For more details, see page 6, section 11, PRO MODE.



Grades :

- The hysteresis can be divided into 8 levels. For more details, see page 6, section 11, PRO MODE.
- Hi-1 or Lo-1 shows the comparative output 1 and Hi-2 or Lo-2 for the comparative output 2 on the secondary display.

8 SELECTION OF THE MODE FUNCTIONING

The DP-100 has 3 different modes of operation:

- RUN mode. For more details, see page 3, section 9, RUN MODE.
- Adjustment mode. For more details, see page 5, section 10, ADJUSTMENT MODE.
- PRO mode. For more details, refer to page 6, section 11, PRO MODE.

change mode

Press MODE to go from one mode to another.

From RUN mode, press MODE for 2sec. to select the mode Adjustment.

From RUN mode, press MODE for 4sec. to select the mode Pro.

To return to RUN mode, press MODE for 2sec.

9 RUN MODE

In RUN mode, it is possible to lock the keys and adjust the threshold of the parameters set in Adjustment mode while the sensor is in functioning. For more details, see page 5, section 10, ADJUSTMENT MODE.

Threshold value settings are shown on the secondary display.

If an attempt is made to set threshold values outside the permitted pressure range, the DP-100 will generate an alert. The secondary display will show: UP (for above the upper limit) or DOWN (below the lower limit). Also DOWN will be displayed if the threshold value Hi exceeds the threshold value Lo in hysteresis or in comparator window mode.

Standard Model

setting 1

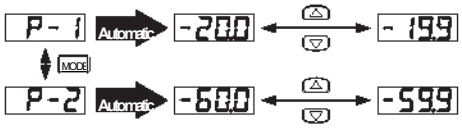
Comparative output 1: EASY (EASY mode)

Comparative output 2: OFF (OFF)

setting 2

Comparative output 1: EASY (EASY mode)

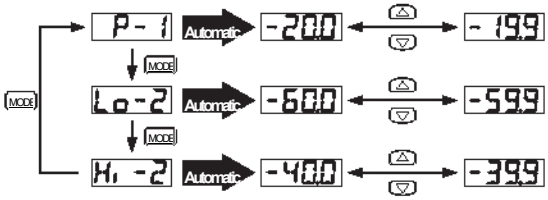
Comparative output 2: EASY (EASY mode)



setting 3

Comparative output 1: EASY (EASY mode)

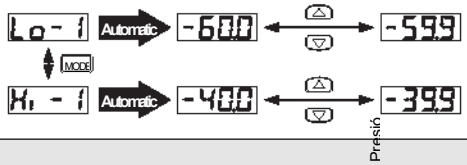
Comparative output 2: HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)



setting 4

Comparative output 1: HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)

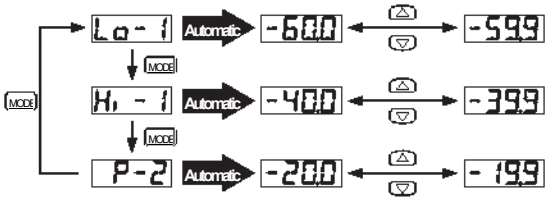
Comparative output 2: OFF (OFF)



setting 5

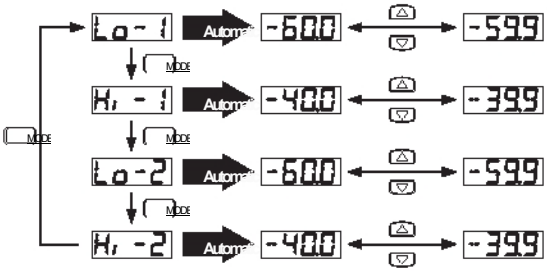
Comparative output 1: HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)

Comparative output 2: EASY (EASY mode)



setting 6

Comparative output 1:	HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)
Comparative output 2:	HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)



Multifunction model

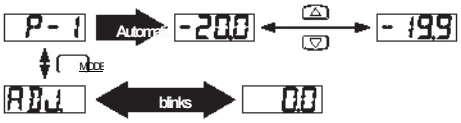
setting 1

Comparative output 1:	EASY (EASY mode)
Analog voltage output / external input:	(Analog voltage output)

setting 2

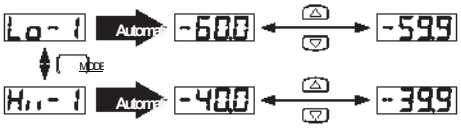
Comparative output 1:	EASY (EASY mode)
Analog voltage output / external input:	AREF (Self Reference Entry) [1], or ZERO (Remote adjustment input of zero) [2]

[1] for more details, see page 7, section 13, FUNCTION OF SELF-REFERENCE.
[2] For more details, see page 8, section 14, FUNCTION REMOTE ZERO ADJUSTMENT, MULTIFUNCTION MODEL.



setting 3

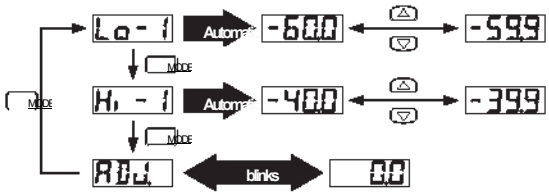
Comparative output 1:	HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)
Analog voltage output / external input:	(Analog voltage output)



setting 4

Comparative output 1:	HYS (Hysteresis Mode), or WCMP (Window Comparator Mode)
Analog voltage output / external input:	AREF (Self Reference Entry) [1], or ZERO (Remote adjustment input of zero) [2]

[1] for more details, see page 7, section 13, FUNCTION OF SELF-REFERENCE.
[2] For more details, see page 8, section 14, FUNCTION REMOTE ZERO ADJUSTMENT, MULTIFUNCTION MODEL.



Common

Zero adjustment function

The zero adjustment function forces the pressure value to zero when the pressure port is open.

To force the pressure value to zero, simultaneously press .

Key lock function

Keypad lock prevents settings from being changed.

To lock, press simultaneously .

To unlock, press simultaneously .

max/min function

The maximum / minimum functions show the peak, maximum and minimum pressure fluctuation. The maximum value is displayed on the main display and the minimum value on the secondary display.

To activate the maximum / minimum function, press simultaneously + .

To deactivate the maximum / minimum function, press simultaneously + .

10 ADJUSTMENT MODE

Adjustment	Description
output mode comparative 1	Configure the output behavior comparative 1.
output mode comparative 2 (Only in the model standard)	Configure the output behavior comparative 2.
analog output of voltage / input external (Only in the model multifunction)	Selects the analog voltage output, the self-reference entry or the remote zero adjustment.
NO / NC	Select between normally open (NO) or normally closed (NC).
Response time	Set the response time to milliseconds (msec.). Response times available: 2.5, 5, 10, 25, 50, 100, 250, 500, 1000, 5000msec.
display color major	Select the color of the main display
pressure unit	Select the desired pressure unit.

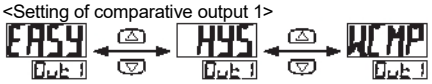
From RUN mode, press for 2sec. to select the mode Adjustment.

The examples below start from the default factory settings.

<RUN mode>

Press for 2sec.

<Setting of comparative output 1>



EASY mode | Mode Hysteresis | Window mode comparator

□ Standard Model

<Setting of comparative output 2> [1]

OFF mode | EASY mode | Mode Hysteresis | Window mode comparator

□ Multifunction model

<Analog voltage output / external input>

analog output tensile | entrance of self reference | adjustment input remote zero

□ Standard Model

<NO/NC> [1, 2]

Output 1: NO Output 2: NO | Output 1: NC Output 2: NC | Output 1: NO Output 2: NC | Output 1: NC Output 2: NO

□ Multifunction model

<NO/NA>

NA | NC

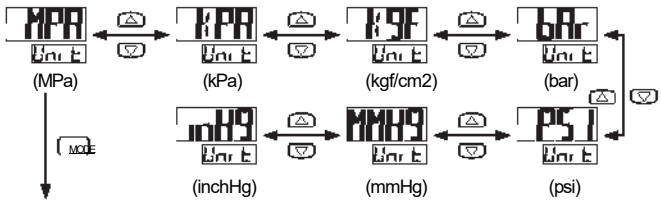
<Response time>

(2.5ms) | (5ms) | (5000ms)

<Main display color>

Red if it is ON Green if OFF | Green if ON Red if OFF | Always red | Always green

<Pressure unit> [3, 4]



(MPa) | (kPa) | (kgf/cm2) | (bar) | (inchHg) | (mmHg) | (psi)

<RUN mode>

[1] Comparative output 2 is set to "OFF" for the standard DP-100 model, the selection of NO / NC (normally open, normally closed) is the same as for the multifunction model, that is, it will set NO or NC for the comparative output 1, not for the two comparative outputs.

[2] The default setting of the high pressure model is NO (normally open), and for the low pressure model it is NC (normally closed).

[3] Default setting for low pressure type is kPA. MPA is not here available.

[4] "inchHg" and "mmHg" are not available for high pressure type.

11 PRO MODE

Adjustment	Description
secondary display	Select what is shown on the display secondary. • OFF: nothing. • Unit: selected pressure unit. • No.**: number. • CuSt: numbers, letters, signs.
speed of display	Sets the speed at which the pressure values on the main display.
hysteresis value	Sets the hysteresis in EASY mode and in comparator window (in 8 levels).
display color (Only in the model standard)	Select the color of the main display based at comparative output 1 or at output comparative 2.
ECO mode	Reduces current consumption. • OFF: normal operation (ECO mode disabled). • Std: if no key is pressed operation for 5 sec. in RUN mode, the display goes dark. • FULL: if no key is pressed operation for 5 sec. in RUN mode, the display goes off. Press any key activate the display temporarily.
check code	The current configuration is shown on the display coded from the DP. See "Code Table" on page 7.
copy mode	Configuration can be copied from a master sensor to slave sensors. For For more details, see page 7, the section 12, COPY FUNCTION SETTING. ON: settings are copied ON-L: The configuration is copied and the slave sensor.
reset	Load factory default settings.

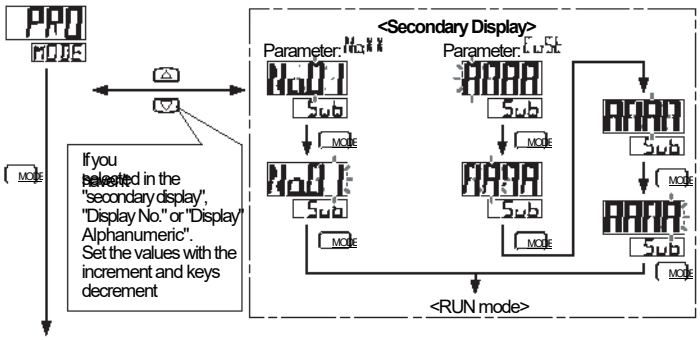
From RUN mode, press for 4 sec. to select the mode Pro.

The examples below start from the default factory settings.

<RUN mode>

Press for 4 sec.

<Pro mode>



<Secondary display>

Standard Display OFF units display no. Alphanumeric Display

<Display speed>

(250ms) (500ms) (1000ms)

<Hysteresis value> [1]

(Max.) (Min.)

< **Standard Model** : Display Color>

display color main will change according to the output comparative 1

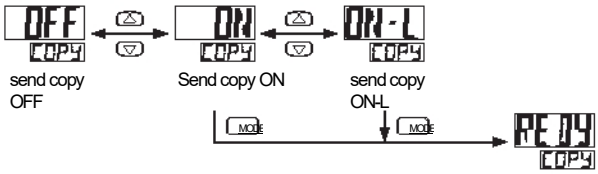
display color main will change according to the output comparative 2

<ECO mode>

OFF Standard Max

<Check code> [2]

<Copy Mode>



send copy OFF Send copy ON send copy ON-L

<Reset>

[1] 1 level = 1 digit approx. if Pa has been selected as the pressure unit.

[2] Consult "Code table" on page 7.

code table

	1st digit		2nd digit			3rd digit	4th digit	
			standard model		Model multifunction			model only standard
	Moc output comparative	Selection NO / NC	Mode output comparative 2	Selection NO / NC	analog output voltage/external	Boundaries	color of main display	display according
0	EASY	NA	OFF	OFF	Analog output P-1, Lo-1 tensile		to: red yes is ON Output	Exit comparative 1
1		NC	EASY	NA	Autorefe-rencia	Hi-1		comparative 2
2	Hysteresis	NA		NC	Remote adjustment P-2, later2		green yes ON Output	Exit comparative 1
3		NC	Hysteresis	NA		Hi-2		comparative 2
4	Window compare-dora	NA		NC		ADJ.	Always red	Exit comparative 1
5		NC	Window compare-dora	NA				Exit comparative 2
6				NC			Always green	Exit comparative 1
7								Exit comparative 2

	5th digit	6th digit	7th digit	8th digit
	Response time	units	display speed	ECO mode
0	2.5ms	MPa	250ms	OFF
1	5ms	kPa	500ms	Std
2	10ms	kgf/cm 2	1000ms	Full
3	25ms	bar		
4	50ms	psi		
5	100ms	mmHg		
6	250ms	inchHg		
7	500ms			
8	1000ms			
9	5000ms			

12 COPY CONFIGURATION FUNCTION

Use this function to copy the configuration of a master sensor to a slave sensor.

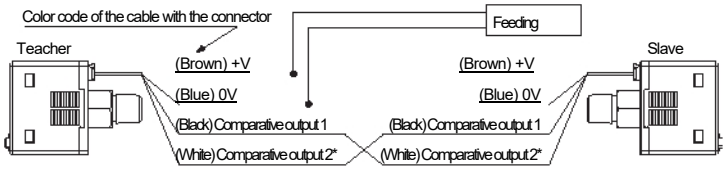
Grades :
- The master and the slave must be of the same model.
- Only one slave can be copied at a time.

Procedure to activate the copy function

1 Select 'Copy ON' or 'Copy ON-L' on the master sensor. press for the sensor to enter copy mode. For more details, consult on page 6, section 11, PRO MODE.

2 Turn off the master sensor.

3 Connect the master sensor and the slave sensor as shown.



*For the multifunction model, analog voltage output / external input.

4 Power the master sensor and the slave sensor at the same time.

5 Master content (16-bit encoded) is displayed in color orange on the main display and copying starts. The same color code is shown on the main display of the slave green, and when copying is complete, OK appears on the menu secondary.

6 Remove power from the master sensor and the slave sensor and disconnect the cable.
To copy the configuration to another sensor , repeat steps 3 to 6 .

[1] power is not supplied at the same time, the configuration may not be copied correctly.

[2] When power is applied, a pulse is sent to comparative output 1.

Procedure for canceling the copy function

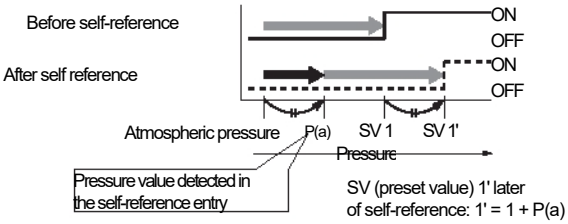
1 With the slave sensor disconnected, supply power to the sensor teacher.

2 Press MODE for approx. 2sec.

13 SELF-REFERENCE FUNCTION

The auto reference function corrects the preset value using the value of the detected pressure as reference pressure.

Using the value of the pressure detected in the auto reference input P(a) as a reference, the preset value 1, is corrected automatically to "preset value 1 + P(a)".

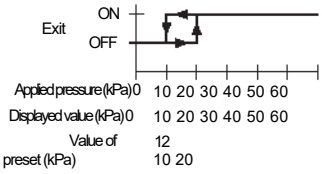


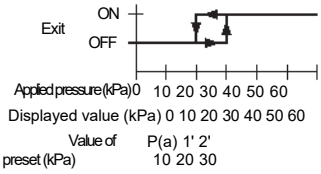
Grades :
- The pressure range that can be set is wider than the nominal pressure range so that the pressure can be used self reference function.
- If the corrected preset value is out of range configurable when the reference input is activated, the preset value is automatically corrected so that falls within the settable pressure range. Thus, be careful not to go outside the configurable range.

operation diagrams

during operation normal. (Outputs comparatives are in NA)

During remote zero adjustment. (Comparative outputs are in NA)
- Pressure detected at the inlet self-reference: 10kPa
- Mode of exit: Mode Hysteresis





Note: Preset values scroll in the same way in EASY mode or in comparator window mode.

- The value of the pressure detected at the auto reference input changes to "zero" when the setting of the analog output function changes in voltage/external input or power is applied again.
- It is possible to check the value of the self-reference input, when it is sets the threshold value in RUN mode. For more details, see page 3, section 9, RUN MODE.

14 FUNCTION REMOTE ZERO ADJUSTMENT, MULTIFUNCTION MODEL

The remote zero adjustment function forces the pressure value to zero when the external signal is activated.

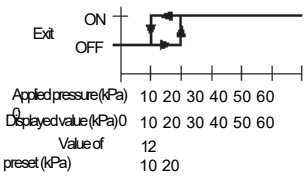
The preset value is not corrected when remote adjustment is activated to zero. Make sure that the pressure value and the preset value, do not they go out of the pressure range, when the remote adjustment to zero is carried out.

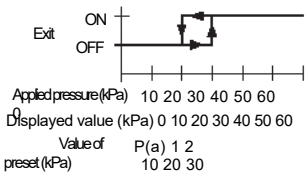
operation diagrams

during operation normal. (Outputs comparatives are in NA)

During remote zero adjustment. (Comparative outputs are in NA)

- Pressure detected at the inlet self-reference: 10kPa
- Mode of exit: Mode Hysteresis





Note: Preset values scroll in the same way in EASY mode or in comparator window mode.

- The remote zero adjustment value is cleared when you change the configuration of the analog output function in voltage/input external power or power is applied again, returning to standby mode. normal operation based on atmospheric pressure.
- The value of remote zero adjustment can be confirmed, when sets the threshold value in RUN mode. For more details, see page 3, section 9, RUN MODE.

15 ERROR INDICATORS

Mistake	Cause	how to correct
E-1	The charge is short-circuited causing overcurrent	remove power and check load
E-3	Pressure is being applied during zero adjustment.	Do not apply pressure to the pressure port; the pressure should be equal to atmospheric pressure. Repeat zero adjustment.
E-4	The external entrance is out of pressure range nominal.	pressure range applicable must be reset so that it is inside rated pressure range.
E-5	Communication error, for example, disconnection, fault in the connection etc.	Check wiring when the copy function is used.
E-6	communication error, wrong model.	Check that the sensor master and slave are of the same model when use the copy function.
XXX	The applied pressure is above upper limit pressure range shown.	pressure range applicable must be reset so that it is inside rated pressure range.
-XXX	The applied pressure is below lower limit (reverse pressure) range displayed pressure.	

16 MODELS AND REFERENCES

DP10 ☐☐ - ☐ - ☐ - ☐

1: low pressure type
2: high pressure type

Nil: standard model
A: multifunction model

Nil: R1 8+M5 female screw
E: G1 8+M5 female screw
M: M5 female screw
N: NPT1 8+M5 female screw

Nil: NPN output type
P: PNP output type

Nil: cable with built-in connector
J: wireless

17 SPECIFICATIONS

Concept		Standard Model		Multifunction model	
		low pressure type	high pressure type	low pressure type	high pressure type
pressure type		nanometer pressure			
Rated pressure range		-100 to +100kPa	-0.1 to +1.0MPa	-100 to +100kPa	-0.1 to +1.0MPa
Settable pressure range		-100 to +100kPa	-0.1 to +1.0MPa	-100 to +100kPa	-0.1 to +1.0MPa
pressure resistance		500kPa	1.5MPa	500kPa	1.5MPa
applicable fluid		non corrosive gas			
Feeding		from 12 to 24V DC □ 10%, Ripple PP 10% or less			
Consumption		• Normal operation mode: 840mW or less (35mA or less at 24V) • ECO mode (STD): 600mW or less (25mA or less at 24V) • ECO (FULL) mode: 480mW or less (20mA or less at 24V)			
comparative output		**<NPN output type>** • NPN open collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output comparative and 0V) • Residual voltage: 2V or less (at 100mA)		**<PNP output type>** • Open collector PNP transistor • Maximum current, source: 100mA • Applied voltage: 30V DC or less (between output comparative and +V) • Residual voltage: 2V or less (at 100mA)	
	Exit	NO / NC, selectable			
	Hysteresis	Min. 1 digit (variable). If psi is used as the unit, 2 digits			
	repeatability	□ 0.1% FS □ 2 digits	□ 0.2% FS □ 2 digits	□ 0.1% FS □ 2 digits	□ 0.2% FS □ 2 digits
	Time of response (msec)	2.5, 5, 10, 25, 50, 100, 250, 500, 1000, 5000msec, selectable			
Analog voltage output		—		• Output voltage: from 1 to 5V • Zero point: 3V □ 5% FS • Span: 4V □ 5% FS • Linearity: 3V □ 1% FS • Output impedance: approx. 1k□	• Output voltage: from 0.6 to 5V • Zero point: 1V □ 5% FS • Span: 4.4V □ 5% FS • Linearity: 3V □ 1% FS • Output impedance: approx. 1k□
external input		—		• ON voltage: **NPN type** : 0.4V DC or less, **PNP type** : 5V to +V DC • OFF voltage: **NPN type** : from 5 to 30V DC or open, **Type PNP** : 0.6V DC or less or open • Input impedance: approx. 10k □ • Entry time: 1 msec. or more	
Temperature		from -10 to +50°C (no condensation, no icing). Storage: from 1 to +60°C.			
Humidity:		from 35 to 85% RH. Storage: 35 to 85% RH.			
temperature characteristic		□ 0.5% FS (reference 20°C)	□ 1% FS (reference 20°C)	□ 0.5% FS (reference 20°C)	□ 1% FS (reference 20°C)
Material		Housing: PBT (with fiberglass); LCD display: acrylic; Pressure port: stainless steel (SUS 303); screws mounting: copper (nickel plated); O-ring: H-NBR; Switch: silicone rubber			
Weight		40 gr. approx. (DP-100-E type: approx. 45g, DP-100-M type: approx. 30g) (Main unit only)			
Accessories		CN-14A-C2 (Cable with a connector, 2m length; optional for type J). Pressure unit label: 1 part.			

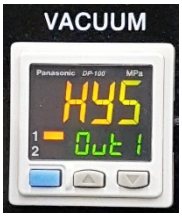
6- FACTORY PROGRAMMING.

The controller is configured at the factory with certain parameters and locked. To visualize them, do it with the pump connected and the external connector installed.
To modify the values, use the ▲▼ arrows found on the front panel.

Home Screen

Keep the **MODE** key pressed for 2 seconds to enter programming.

The controller is factory configured in the Output Mode “Hysteresis Mode” .

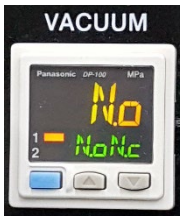


The working mode for our pump to control the vacuum between two points is this mode, **DO NOT MODIFY** .

Press the **MODE key,** the controller will show us the status of output 2, which is not used.

DO NOT CHANGE

Press the **MODE key,** the controller will show us the status of the active output, that is, 1, from being in the normally open state "No"



DO NOT CHANGE

Press the **MODE key,** the controller will show us the response time in milliseconds. It can vary between different preprogrammed values, if in doubt do not modify it.

Press the **MODE key,** the controller gives us the option to change the color of the main display (see manual for options), by default as shown in the image.

Press the **MODE key,** the controller gives us the option to change the units of measure. By default, the programmed unit is "Bars"

Press ▲▼to change the units.

Press the **MODE key,** the controller will return to the initial screen giving a value of 0.00 bar since the pump does not work, because the rear connector is connected. Remove it and the pump will start working, since they come from the factory adjusted to -1.00 bar of maximum vacuum, therefore, it does not control, it works continuously.

To program the pump between vacuum limits, reconnect the rear connector, and go to section 6.

7- PROGRAMMING

The controller allows you to set two vacuum points between which the pump will maintain a vacuum.
It will depend on how the get Hi and Lo parameters are set.

The Hi and Lo parameters indicate:

Hi = Point of lowest vacuum.
Lo = Point of greatest vacuum

7.1 Vacuum Regulation-Simple mode

The Controller only indicates the vacuum that is obtained. It is the factory programming:

Hi = -0.05
Lo = - 1.0 bar

With this programming the vacuum regulating valve can be used.

With the pump connected to the system under vacuum and the control of the regulating valve "2" completely closed (turning to the right), the vacuum indicator will mark the maximum vacuum reached by the system.

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

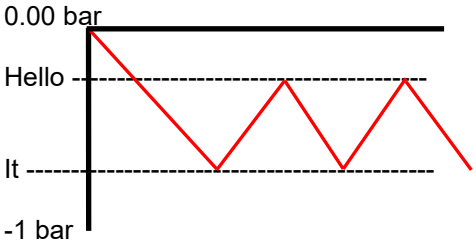
7.2 Control mode

It allows to maintain the vacuum of the pump between two set points Hi and Lo.

Press **MODE** and Lo -1 and a value appear at the bottom of the screen. Press ▲▼ to select the desired value

Press **MODE** and appears at the bottom of the screen Hi -1 and a value. Press ▲▼ to select the desired value

See graph



Example : to control the gap between 2 limits

To maintain a vacuum between -0.85 and -0.80 bar, choose the highest vacuum point Lo -0.85 bar and -0.80 bar as the lowest vacuum point Hi.

The pump starts working and when the vacuum reaches -0.85 bar it will stop and when it goes back to -0.80 bar it will start working again to recover the vacuum.

7.3 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 adjust the value of "0", insert the connector into the rear connection with the pump off.
Next, start the pump, the motor will remain stopped, and the indicator will show a value of “0” or close.

To make the adjustment, press ▲▼ simultaneously and the Autozero will be carried out automatically.

Remove the rear connector and the engine will start.

7.4 Lock/Unlock

The indicator is factory programmed in the LOCK-ON situation.

To unlock the system press simultaneously **MODE** and ▼ for 2 seconds and it will appear
LOCK OFF

To lock the system act the same and LOCK-ON will appear

8- TABLES

Data of interest on the basis of the relationship:

Vacuum gauge reading = Atmospheric pressure – residual pressure

The following unit equivalences can be established

	pa	kPa	MPa	kgf/ cm2	mmHg	psi	bar	lnHg	mmH2O _ _
pa	1	0.001	0.000001	0.000010197	0.00750062	0.000145038	0.00001	0.0002593	0.101968
kPa	1,000,000	1	0.001000	0.010197	7.500616	0.145038	0.010000	0.2953	101.9689
MPa	1,000,000	1000	1	10,197	7500,616	145,038	10	295.2998	101,968.9
kgf/cm ²	98,066.5	98.0665	0.0980665	1	735,559	14.2233	0.980665	28.95979	10,000.20
mm Hg	133.32	0.1332	0.000133	0.0013595	1	0.019336	0.0013332	0.039370	13.5954
psi	6895	6,895	0.006895	0.07031	51.7157	1	0.06895	2.036074	703.07
bar	100000.0	100,0000	0.100000	1.01972	750,062	14.5038	1	29.52998	10,196.89
inHg	3,386,388	3.386388	0.003386	0.034530	25,40000	0.491141	0.033863	1	345,324
mmH2O _ _	9.80665	0.00980		0.000099	0.0735578	0.00142	0.000098	0.002895	1

Indicator Pascal readings are displayed in Mega Pascals

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

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

9- EXTERNAL CONNECTION OPERATION

Using the connector supplied with the pump, it is possible to connect any system (PLC, etc.) that activates the relay control that the pump has.

You can also connect a foot pedal that will operate the pump when stepped on. When connecting the pedal the pump will remain stopped. Pressing the pedal permanently the pump will work and stop when the pedal is released.

Order pedal separately. Code 1.9740.00

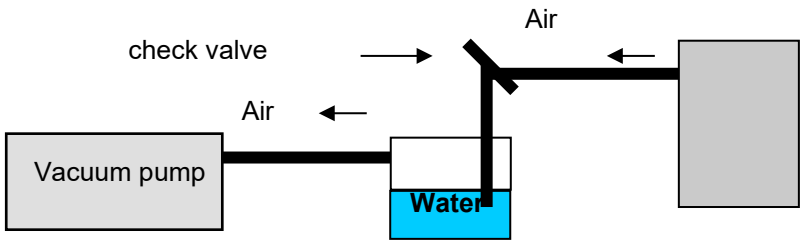
10- ACCESSORIES

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

10.1 Vacuum trap installation scheme

In those cases in which there is production of vapours, bothersome and harmful to people, or harmful to the integrity and duration of the membranes and pump 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

11- SPECIFICATIONS

Code	Empty bar	Pressure Bar	Flow L/min	Empty-meter	Regu-lator	Measures cm	kg
1.9515.15	-0.98 ± 2%	2	12	(1)	Yes	24x27x10	3.8

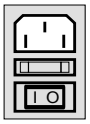
(1) Controller-digital vacuum indicator.

12- ELECTRICAL POWER SUPPLY

100…240V AC 50/60Hz. 1Amp fuse.

13- CHANGE OF FUSES

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



14- MAINTENANCE-REPLACEMENT

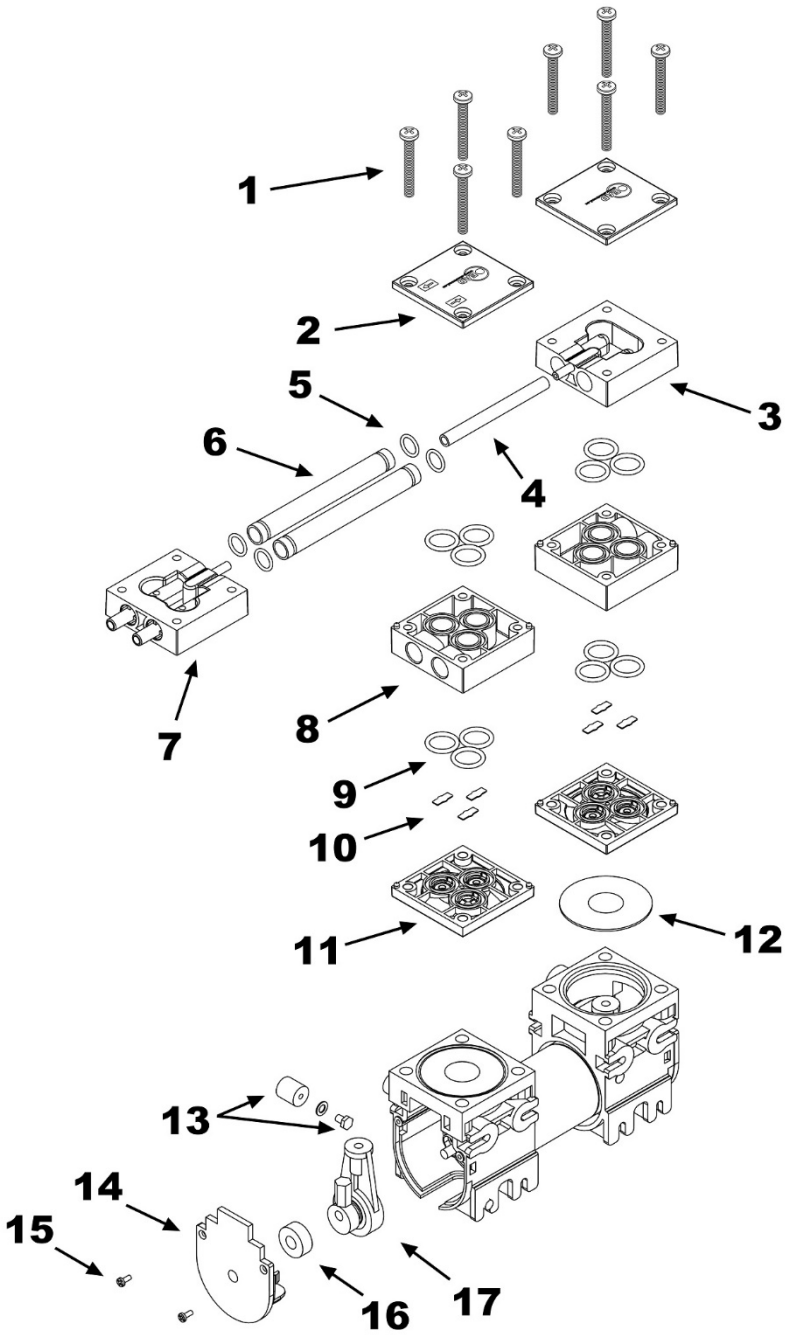
Before proceeding with any examination or repair of the appliance, it is necessary to disconnect the mains socket. Any initiative must be carried out by qualified personnel to avoid greater evils.

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

DINKO vacuum pumps do not require maintenance, as they mount self-ventilated magnetic induction motors that work dry. They are not affected by liquid reabsorption, but if this occurs and the vacuum is lost, it will be necessary to disassemble the head and proceed to clean the membranes and valves. Avoid the entry of air that contains sticky substances as these will remain inside the pump, shortening the duration 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 controller or indicator.
1.0033.02	External connector
1.9518.27	Digital Vacuum Controller DP-102
1.0070.80	Set of rubbers, 2 membranes and accessories
1.0070.38	Motor-Engine
1.8738.00	Silicone tube for vacuum 5x10mm, 1 meter
1.0072. 01	Vacuum control valve.

15- EXPLODED PUMPS



Note of interest:

Disposal of waste electrical and electronic equipment by users within the European Union.
This symbol on the product or on the packaging indicates that it may not be disposed of as normal 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 it is recycled in a way that protects human health and the environment.

16- ABNORMALITIES

The pump does not seem to give the expected vacuum:

a) There may be an air leak into the vacuumed enclosure.

b) Disconnect the pump from the system, turn the vacuum adjustment knob fully to the right and close the squeegee with your finger.

The vacuum gauge on the pump should indicate the usual maximum vacuum of the pump.
If this is not the case, the membrane or internal valves have deteriorated and it is necessary to change them 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 the technical service or request a replacement. See section spare parts and diagrams.

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

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

d) Consult the table of vacuum equivalencies due to altitude. The higher the altitude, the less empty. 674mm Hg at 1000 meters of altitude is equivalent to 760mm Hg at sea level.

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

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

e-2) It is not carried out: the pump creates a sufficient vacuum but does not filter. Maybe the pore size of the filter is too small and clogged. Do 2 or 3 filtrations instead of just one or use larger diameter filters.

e-3) It takes too long. The vacuum system is very large and requires a pump to evacuate air faster.

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

17- WARRANTY

Duration:

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

Warranty Scope:

The guarantee is given against manufacturing and material defects for an average work week of 40 hours. The guarantee is reduced proportionally to the increase in working hours.
Repairs will be made in our factory. Otherwise, the guarantee will only include the replacement of the defective elements.
DINKO will not be responsible for the transport costs, nor will it assume responsibility for the consequences caused by the immobilization of the device.
The parts replaced free of charge remain our property, reserving the right to request their return, free of postage to our address.
Repairs or replacement of parts during the warranty period do not extend the initial warranty.
Our responsibility is limited to the attached guarantee and not to possible accidents to persons or other things.
Any alteration of the device by the user voids the guarantee.

18- "CE" DECLARATION OF CONFORMITY

DINTER SA
DINKO Instruments c/ Encarnació, 123-125 / 08024 - Barcelona

Declares that the items 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/CEE of December 12, 2006

- Essential requirements of Annex I of the Machinery Directive 2006/42/CEE

-Electromagnetic Compatibility Directive
2004/108/EEC

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

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

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

Name *:*	Joan A. Bravo	JosepX.Sensada
Post:	Technical Director	ResponsiblQuality
Signature		

Model: D-95 Vacuum Pumps

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

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