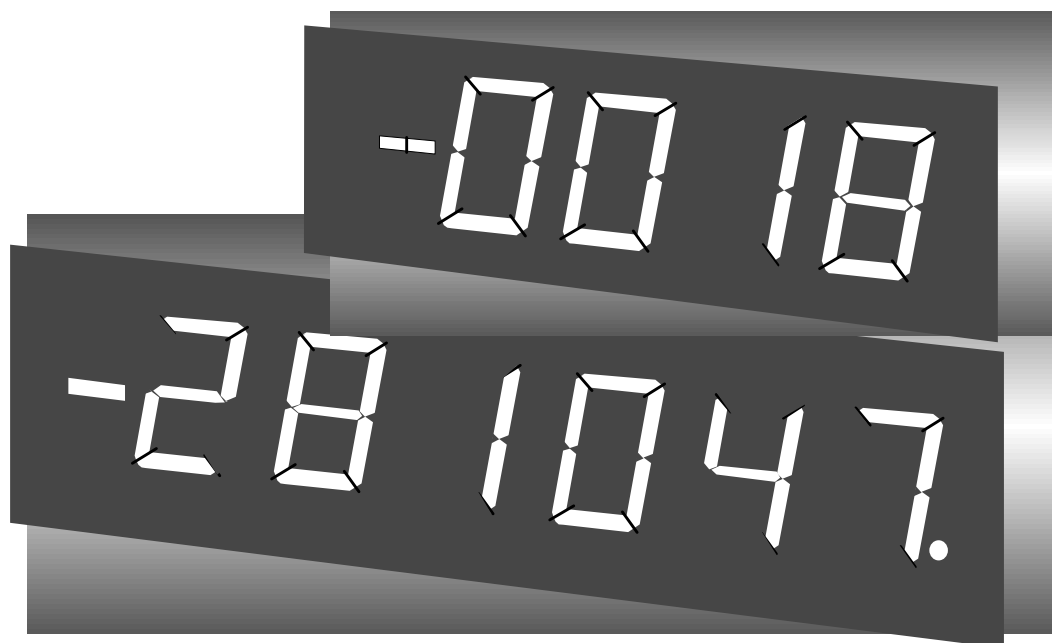


User's Guide



*<http://www.omega.com>
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LDP-124, LDP-126, LDP-144 AND LDP-146

OPERATOR'S MANUAL FOR RATE/TOTAL



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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains,
and reserves the right to alter specifications without notice.

WARNING : These products are not designed for use in, and should not be user for, patient connected applications.

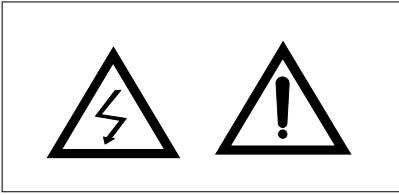
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1.- IMPORTANT SAFETY CONSIDERATIONS

INSTALLATION

PRECAUTIONS.-



The installation and the future use of this unit must be done by suitable qualified personnel. The unit has not AC (mains) switch, it will be in operation as soon as power is connected. The instal-

lation must incorporate an external main switch.

The unit has a protection fuse incorporated on the AC socket, if it is necessary to change or replace, use the fast fuse according DIN 41661 and the values indicated below.

200 mA when the unit is operating at 230 Vac
400 mA when the unit is operating at 115 Vac.

Install also the necessary devices to protect the operator and the process when using the unit to control a machine or process where injury to personnel or damage to equipment or process, may occur as a result of failure of the unit.

See paragraph 9, WIRING and paragraph 8, SIGNAL INPUT PARAMETERS and check that all jumpers are on the correct position.

SAFETY PRESCRIPTIONS.-



The unit has been designed and tested under EN-61010-1 rules and is delivered in good condition. This operator's manual contains useful information for electrical connections. Do not make wiring signal changes or connections when power is applied to the unit. Make signal connections before power is applied and, if reconnection is required, disconnect the

AC (mains) power before such wiring is attempted.

Install the unit in places with a good ventilation to avoid the excessive heating. And far from electrical noise source or magnetic field generators such as power relays, electrical motors, speed controls etc...

The unit cannot be installed in open places. Do not use until the installation is finished.

POWER SUPPLY.-

The power supply must be connected to the adequate terminals (see the connection instructions). The characteristics of the power supply are showed on the label on the rear part. Please make sure that the unit is correctly connected to a power supply of the correct voltage and frequency.

Do not use other power supply otherwise permanent damage may be caused to the unit.

Do not connect the unit to power sources heavily loaded or to circuits which power loads in cycle ON-OFF or to circuits which power inductive loads.

SIGNAL WIRING.-

Certain considerations must be given when install the signal input and control wires. If the wires are long can act like an antenna and introduce the electrical noise to the unit, therefore :

Do not install the signal input or control wires in the same conduit with power lines, heaters, solenoids, SCR controls etc....and always far from these elements.

When shielded wires are used, connect the shield to the common terminal and leave unconnected the other end of the shield and do not connect to the machine ground.

EXCITATION SUPPLY Vexc.

The unit supply the excitation voltage to power encoders, pulse generators, sensors etc...

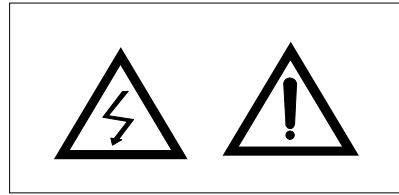
Do not connect the Vexc. output terminal to other external power supply, permanent damages may result to the unit.

SAFETY CONSIDERATIONS

PRESCRIPTIONS.-

Before starting any operation of adjustment, replacement, maintenance or repair, the unit must be disconnected from any kind of power supply.

Keep the unit clean , to assure good functioning and performance. Use for it a clean and humid rag. Do not use for the frontal lens abrasive products, solvents, alcohol, etc... because its transparence



could be damaged and this may cause difficulty for a correct vision of the reading.

To prevent electrical or fire hazard, do not expose the unit to excessive moisture.

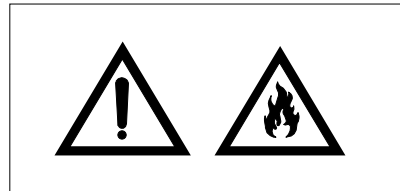
Do not operate the unit in the presence of

flammable gases or fumes, such as environment constitutes a definite safety hazard. The unit is designed to be mounted in a metal panel.

If the unit shows signs of damage, or is not able to show the expected measures, or has been stored in a bad conditions or a protection failure can occur, then do not attempt to operate and keep the unit out of service.

IN CASE OF FIRE

- 1.- Disconnect the unit from the power supply.
- 2.- Give the alarm according to the local rules.



- 3.- Switch off all the air conditioning devices.
- 4.- Attack the fire with carbonic snow, do not use water in any case.

WARNING : In closed areas do not use systems with vaporized liquids.

CONNECTIONS

All wiring connections are made using push-in cable connectors. There is a separate connector block for power supply and input signals . Please make sure that each connector block is connected on the adequate place.

The wire cross section recommended for signal inputs is 1 mm² and for power supply 2.5 mm².

PANEL MOUNTING

Verify that the panel cut-out is correctly according to the dimensions indicated on page 10 with a minimum depth of 150 mm. (5.9").

Install the fixation pieces in the lateral guides of the unit by its rear part and then turn the screw firmly against the panel, until the unit is totally hold on.

See paragraph 10 on page 10.

2.- UNPACKING AND INSPECTION

It is advisable to do a detailed reading of this Manual before mounting the instrument. This Operator's Manual contains all the technical specifications : electricals as well as mechanics, both necessary to do a correct installation and also a good use of the instrument.

At the same time the user will acquire the knowledge needed to obtain the best performances of the product.

Check that inside the present cardboard box, there are the following :

- 1 Instrument Model LDP-1XX-F1, F2, F3, F5, F6 or FF.
- 1 Operator's Manual.
- 1 Connector for Power Supply.
- 1 Screw-clamp connectors, 5 pins female for signal inputs.
- 2 Pieces for fixing the unit against the panel.

If there are some doubts or inquiries about the present instrument, please contact **OMEGA ENGINEERING'S customer service department**.

When the shipment arrives remove the Packing List and verify that you have received all equipment. Then inspect the box and the instrument, and if there is evidence of damage caused by bad handling during the transport, it is advisable to make a careful inspection of all damages making a note of all of them and to pass on this information directly to the Transport Company.

If this occurs but with insured material, ask the Transport Company for instructions about submitting a claim

3.- MAIN FEATURES

The Large Displays for Totalizer and Rate are made up by four different series. The main features of each serie are the following :

Serie LDP-124-XX : 4 digits type LED, seven segments, red or green colour with 57 mm (2.3") height and minus sign for polarity.

Serie LDP-126-XX : 6 digits type LED, seven segments, red or green colour with 57 mm (2.3") height and minus sign for polarity.

Serie LDP-144-XX : 4 digits type LED, seven segments, red or green colour with 100 mm (4") height and minus sign for polarity.

Serie LDP-146-XX : 6 digits type LED, seven segments, red or green colour with 100 mm (4") height and minus sign for polarity.

The complete reference for each instrument is obtained replacing the ""XX" by the corresponding references for every Model (F1, F2, F3, F5, F6 & FF). See paragraph 4.

The common features for all series are the following:

MECHANICAL.- Housed in a rugged extruded aluminium profile housing for panel mounting or free standing. Finished in anodized black colour. The frontal lens is mounted with a special rubber profile which provides the front part of the unit with an IP-65 protection.

SIGNAL INPUT.- All series have two channel inputs. Channel 1 serves as the count in every Response Mode and Channel 2 serves as the control function or to count.
Both Channels accept signal generated by NAMUR, PNP or NPN sensor types and contact closure. Magnetic PICK-UP sensor is only accepted by Channel 1.

CONNECTIONS.- Connections for Signal Inputs or control functions are made using one screw-clamp connector of five terminals located on the rear part of the unit.
The recommended wire cross section is 1 mm².
Connection for Power Supply uses a push-in cable connector with 2 terminals for power and 1 terminal for earth.
The recommended wire cross section is 2.5 mm².
The fuse is located in the Power Supply socket, as well as the spare fuse.

MEMORY.- Non volatile NOV-RAM type, to maintain stored the software configuration and the value of the display in case of power failure. It allows 100,000 cycles ON/OFF. The data can be stored for a maximum of 10 years.

RESET.- By remote push-button using the connector of 5 terminals on the rear part.

DECIMAL POINT.- Programmable by software. Contact your local distributor for additional information.

SCALE FACTOR.- The Scale Factor can be programmed from -5.9999 to 5.9999. Factory Set-up is 1.0000. Contact your local distributor.

4.- MODELS

4.1.- MODEL LDP-1XX-F1, TOTALIZER WITH INHIBIT FUNCTION

Pulses per Channel 1 add up. Channel 2 operates as Inhibit control.
Counter remains held during all time that the Channel 2 remains connected to 0 Vdc. and runs free meanwhile Channel 2 is free.

4.2.- MODEL LDP-1XX-F2, TOTALIZER WITH UP/DOWN CONTROL

Pulses per Channel 1. Channel 2 operates as UP/DOWN control.
If Channel 2 is connected to 0 Vdc. then the pulses will subtract.
If Channel 2 is free then the pulses will add up.

4.3.- MODEL LDP-1XX-F3, TOTALIZER UP/DOWN WITH SEPARATE INPUTS

Pulses per Channel 1 to add up.
Pulses per Channel 2 subtract to the display.
The instrument allows that both pulses in Channel 1 and Channel 2 can be simultaneously.

4.4.- MODEL LDP-1XX-F5, TOTALIZER UP/DOWN WITH QUADRATURE CONTROL

Channel 1 serves as the count and Channel 2 serves as a quadrature control.
(See paragraph 9.7).

4.5.- MODEL LDP-1XX-F6, TOTALIZER UP/DOWN WITH QUADRATURE CONTROL

Same characteristics of the LDP-1XX-F5 including multiplier by 4

4.6.- MODEL LDP-1XX-FF, RATE

Pulses per Channel 1. Do not use Channel 2.
The function of this model is to show on the display parameters by time unit, such as RPM, mts/sec., liters/hour etc...
The minimum frequency allowable is 0.03 Hz.

5.- GENERAL SPECIFICATIONS

DISPLAY

TYPE 4 or 6 digits, 7 segments, red or green LED.
 HEIGHT DIGIT 57 (2.3") or 100 mm. (4")
 RANGE -9999 to 9999 or
 -999999 to 999999
 POLARITY Minus only (-)
 DECIMAL POINT Programmable position.

SIGNAL INPUTS..... Selectable by internal jumpers.

PNP, NPN, NAMUR & Switches .. Max. input voltage +28 V
 Pick-up (Channel 1 only) Sensitivity : 150 mV.
 Hysteresis : 100 mV
 Impedance 26.5 K Ω at 60 Hz.
 Max. input voltage \pm 50 V.

FREQUENCY INPUT Selectable by internal jumpers.

Models F1 & F2 100 Hz or 10 KHz.
 Model F3 100 Hz or 4 KHz.
 Model F5 100 Hz or 5 KHz.
 Model F6 100 Hz or 2.5 KHz.
 Model FF 100 Hz or 10 KHz
 Minimum allowable 0.03 Hz.
 Accuracy & Repeatability +0.012 % (Rate only).

6.- FRONT VIEW, DESCRIPTION

Models LDP-124-XX
 LDP-144-XX



Models LDP-126-XX
 LDP-146-XX



OUTPUT

EXCITATION VOLTAGE OUTPUT . +15 Vdc 20%. @100 mA. max.
 (Terminal B)

ENVIRONMENTAL

OPERATING TEMPERATURE 0 to +50 °C (32 to 122 °F).
 STORAGE TEMPERATURE .. -20 to +85 °C (-4 to 185 °F).
 RELATIVE HUMIDITY 0 to 85 % not condensed.
 PROTECTION IP65. (Front part only).

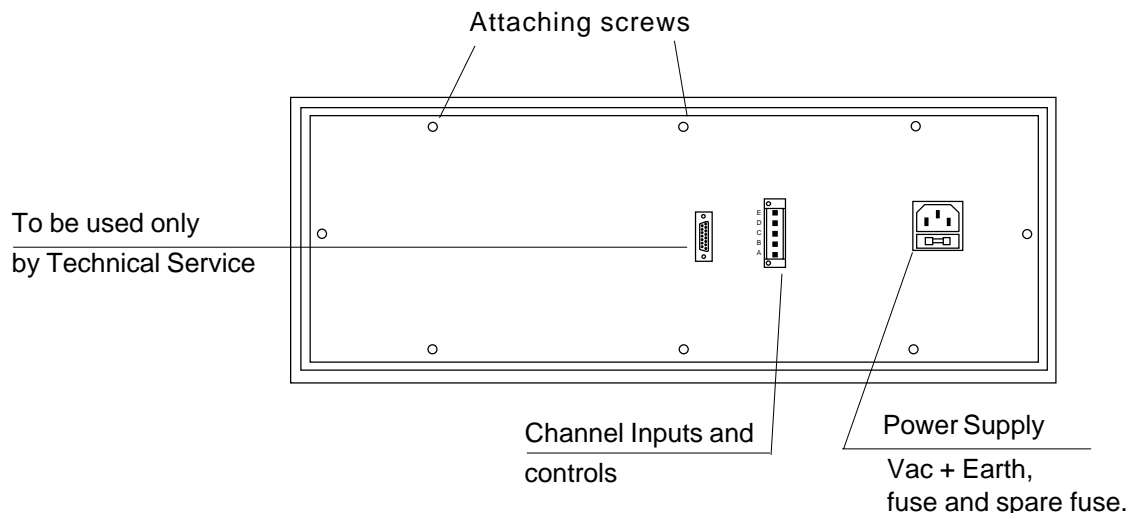
MECHANICAL

DIMENSIONS See table 5. Page 10.
 PANEL CUT OUT See table 5. Page 10.
 DEPTH See table 5. Page 10.
 WEIGHT See table 5. Page 10.
 CASE MATERIAL Aluminium extruded.
 FINISHED Anodized, black colour.

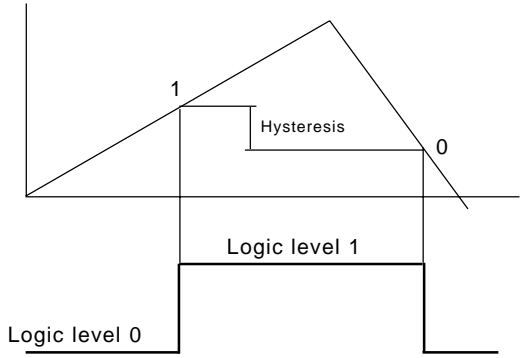
ELECTRICAL

STANDARD POWER SUPPLY 115 Vac. \pm 10% 50 / 60 Hz.
 Optionally 230 Vac
 CONSUMPTION See table 5. Page 10.

7.- REAR VIEW, DESCRIPTION for all series

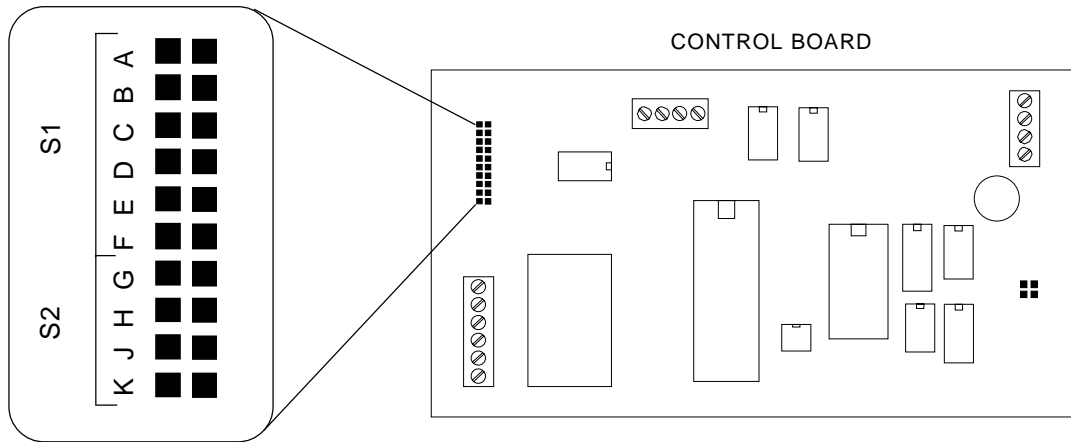


8.- SIGNAL INPUT PARAMETERS



Usually the signals to be counted or to be used as signal controls are produced by electronic devices such as proximity switches, photocells, pulse generators or mechanical closures. The electronic sensors type NPN, PNP or NAMUR can be used if the minimum output level is not lower than the indicated on the table below.

NOTE : The signal level supplied by NAMUR sensors depends on the air gap between the sensor and the metal, therefore it is recommended to measure the real level logic 1 (ON) and level logic 0 (OFF).



INPUT TRIGGER SELECTION

Logic level 1	> 3.75 Vdc.	> 7.5Vdc.
Logic level 0	< 1.5 Vdc.	< 5.5 Vdc.
Jumper	H Closed (Channel 1) G Closed (Channel 2)	H Opened (Channel 1) G Opened (Channel 2)

TABLE 1

COUNT FREQUENCY SELECTION

FREQUENCY INPUT	CHANNEL 1	CHANNEL 2
To 100 Hz	Jumper J Closed	Jumper K Closed
To 10 KHz	Jumper J Opened	Jumper K Opened

TABLE 2

The unit is provided with damping capacitors for switch contact debounce. Limits count frequency to 100 Hz. maximum and input pulse widths to 5 msc. minimum. To obtain a good protection select the adequate jumpers as indicated on the table above.

SENSOR TYPE SELECTION

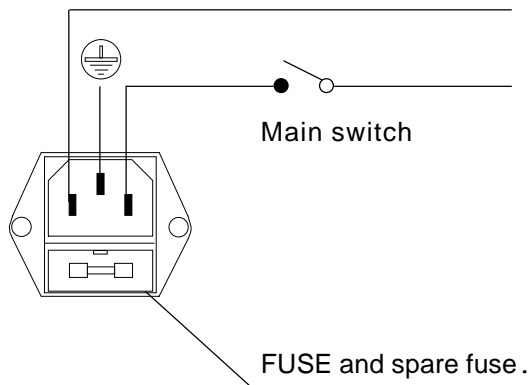
SENSOR TYPE	CLOSE JUMPERS	
	CHANNEL 1	CHANNEL 2
PICK-UP	E	No available
NAMUR	B - D - F	C
NPN	A - D - F	A
PNP	A - B - D - F	A - C
Mechanical closure	A - D - F	A

TABLE 3

If a sensor type NAMUR is used, then the same type must be used for both Channels.

9.- WIRING

9.1.- POWER SUPPLY, RECOMMENDED WIRING



POWER SUPPLY
115 Vac (230 Vac Optional).

9.2.- PROTECTION FUSES

The unit has a protection fuse located on the power supply socket.

If this fuse must be replaced or changed because the power supply is changed, use the time-lag fuse according to IEC 127/2 with the values indicated on the table.

Power Supply	Fuse value
230 Vac	0.2 A
115 Vac	0.4 A

TABLE 4

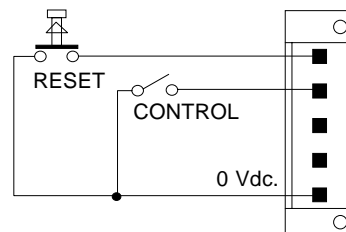
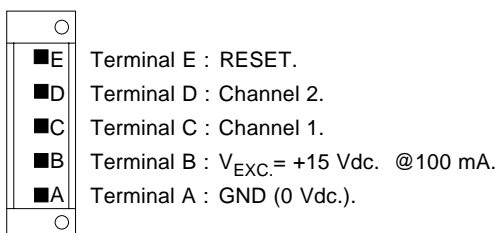
9.3.- RESET AND CONTROL FUNCTIONS

RESET: Display will show "0" when terminal E (RESET) is connected to terminal A (0 Vdc.) and will remain in "0" meanwhile terminals E and A remain connected.

CONTROL : This function is operative when terminal D (Channel 2) is connected to terminal A (0 Vdc.).

On model LDP-1XX-F1, Channel 2 operates as INHIBIT control.

On model LDP-1XX-F2, Channel 2 operates as UP/DOWN control.



9.4.- EXCITATION VOLTAGE FOR SENSORS

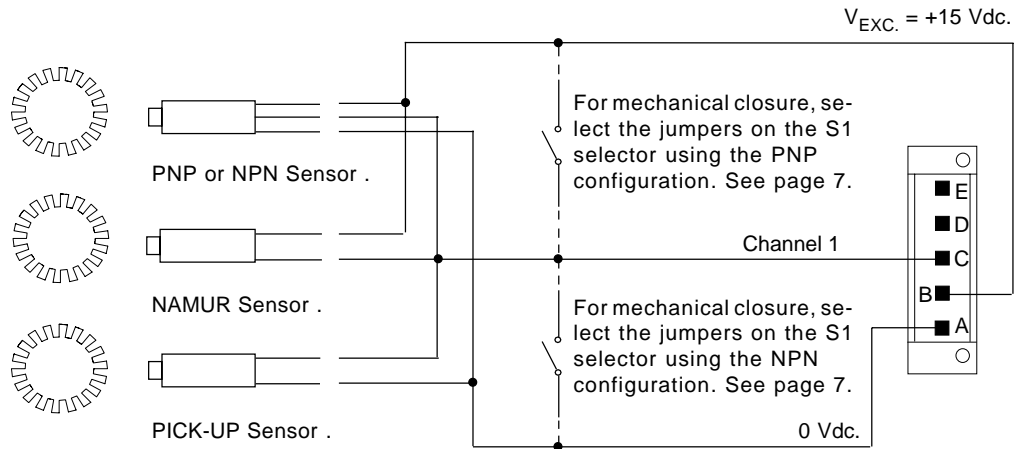
The unit supplies the Excitation Voltage for sensors, through terminal B.

If the current required for the sensors or encoders installed is more than 100 mA then do not use this terminal. Install other external power supply.

9.5.- SENSOR CONNECTIONS FOR MODELS LDP-1XX-F1, LDP-1XX-F2 and LDP-1XX-FF

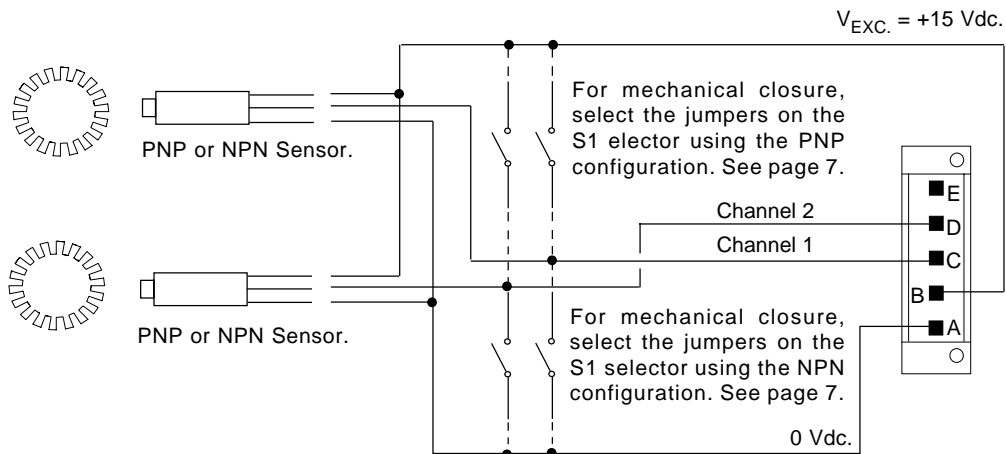
Pulses by Channel 1 (terminal C).

INHIBIT or UP/DOWN controls by Channel 2 (terminal D, see paragraph 9.3.- RESET AND CONTROL CONNECTIONS).

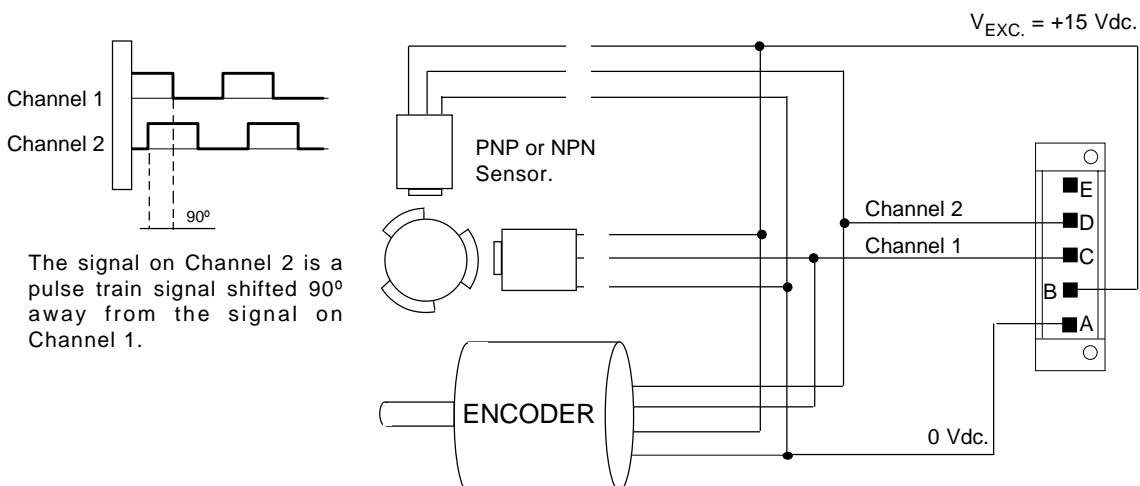


9.6.- SENSOR CONNECTIONS FOR MODEL LDP-1XX-F3

The display will add all the pulses arrived by Channel 1 (terminal C) and will subtract all the pulses arrived by Channel 2 (terminal D).

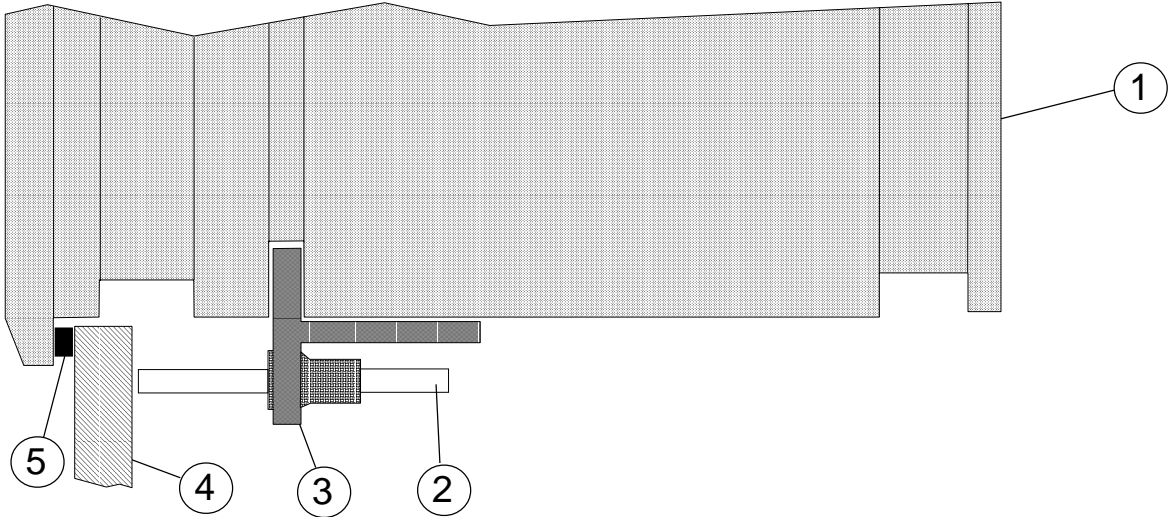


9.7.- SENSOR CONNECTIONS FOR MODEL LDP-1XX-F5 and LDP-1XX-F6



10.- INSTALLATION

- 1.- Prepare a panel cut-out with the dimensions indicated on paragraph 11.
- 2.- Slide the instrument (1) into the cut-out.
- 3.- Slide the two fixation pieces (3) with T shape by both lateral sides of the instrument, such as it is shown on the drawing below.
- 4.- Turn the screw bolt until it is pressed firmly against the panel (4) and the instrument (1) remains totally fixed.
- 5.- The front part of the instrument has the necessary elements to provide an IP 65 protection. If the panel where this instrument must be installed, it must to comply some protection standards against water splashes, then a rubber profile must be installed with a rectangular or round shape (5) on the place indicated and shown on the drawing below.



11.- MECHANICAL DIMENSIONS mm (inches)

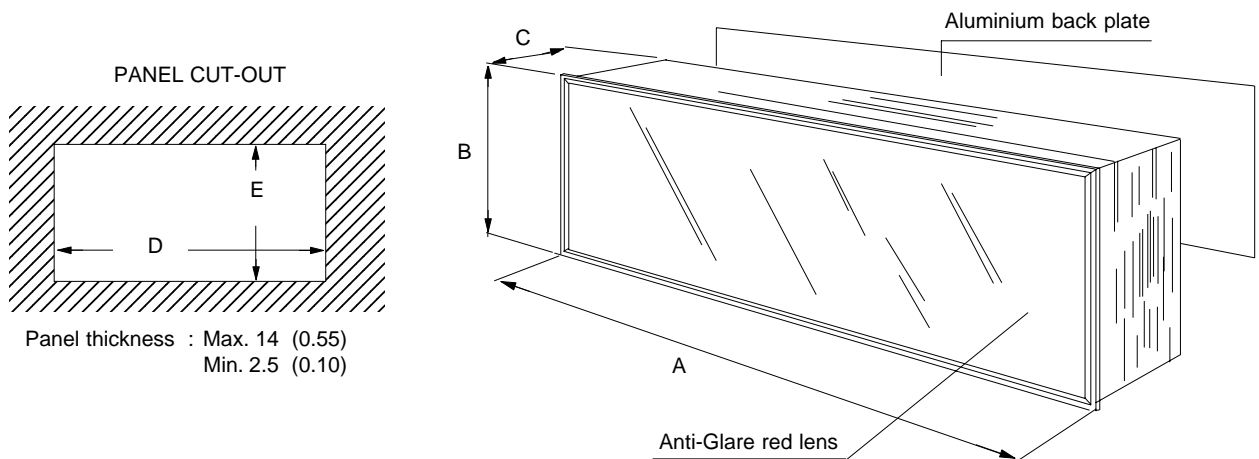


Table 5

		DIMENSIONS			PANEL CUT-OUT		WEIGHT	POWER
Digits	Height	A	B	C	D	E		
4	57 (2.3)	264 (10.4)	120 (4.75)	112 (4.41)	256 (10.07)	112 (4.4)	2.3 Kg (5 lbs)	6 VA
4	100 (4)	480 (18.9)	180 (7.09)	112 (4.41)	472 (18.58)	172 (6.77)	5 Kg (11 lbs)	12 VA
6	57 (2.3)	384 (15.12)	120 (4.75)	112 (4.41)	376 (14.8)	112 (4.4)	2.7 Kg (6 lbs)	6 VA
6	100 (4)	688 (27.1)	180 (7.09)	112 (4.41)	680 (26.77)	172 (6.77)	5.7 Kg (12.5 lbs)	12 VA

Dimensions in mm. Parenthesis are in inches or pounds.
Add 27 mm (1.1) to the dimension C for power connector.

12.- JUMPER'S CONFIGURATION

12.1.- STANDARD CONFIGURATION

The factory set-up jumper's configuration, it is shown below unless customer had specified another configuration.

SENSOR SELECTION Type NPN.
SIGNAL LEVEL Type "A" (page 7).
FREQUENCY RANGE 100 Hz.
DECIMAL POINT None.
SCALE FACTOR "1".

12.2.- PROCEDURE FOR CHANGE THE CONFIGURATION

If the sensor type is modified or the characteristics of the installation are changed then it is necessary to modify the initial jumpers configuration. Please follow the configuration procedure shown below.

- 1.- Power off the instrument.
- 2.- Remove the rear cover taking off all the screws (page. 6) to obtain the access to the control circuit. (page 7).
- 3.- Remove all jumpers installed on S1 and S2 selectors. (Page 7).
- 4.- Configure the sensor type for Channel 1 using the jumpers on S1 selector (See table 3 page 7).
- 5.- Configure the sensor type for Channel 2 using the jumpers on S1 selector (See table 3 page 7).
- 6.- Select the frequency range using the jumpers J and K on S2 Selector (see table 2 page 7).
- 7.- Select the signal input level using the jumpers H and G on S2 Selector (see table 1 page 7).
- 8.- Install the rear cover on its place and power up the instrument.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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