



**OP-LDP2 96 x 48 DIN 1/8  
Position Measurement and Control Unit  
With Voltage/Current/Potentiometer  
Input**

- 4 Digit Process (PV) Display
- V  $\overline{\text{---}}$  , mA  $\overline{\text{---}}$  and Potentiometer Process Input
- Two Point Calibration Feature
- Offset Adjustment Feature
- Relay Output Module System
- Programmable Alarm Functions
- Programmable Decimal Point Position
- Programmable Screen Filter
- RS-232 (standard) or RS-485 (Optional) Serial Communication with Modbus RTU Protocol

## 1.Preface

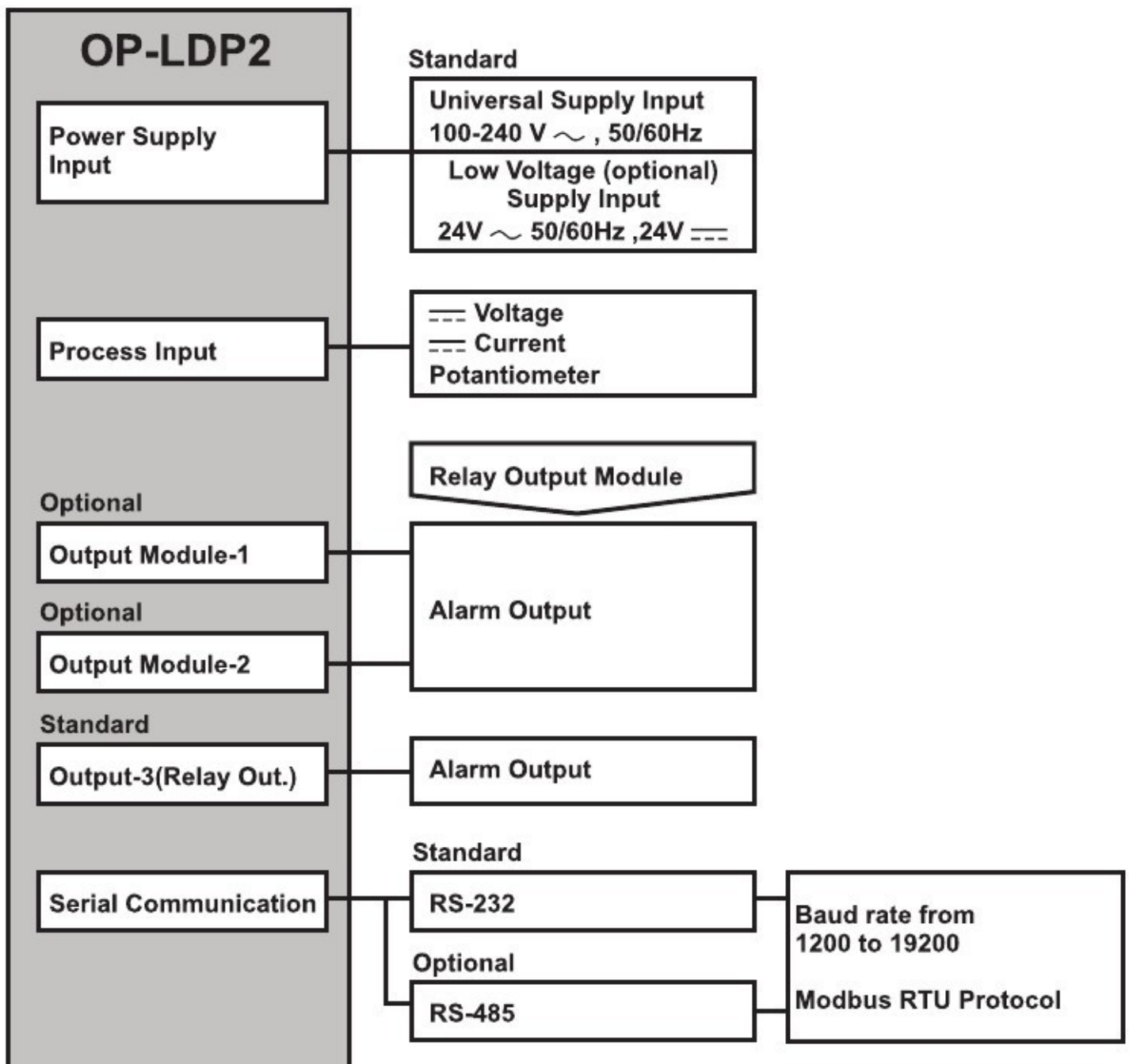
OP-LDP2 unit is designed for measuring and controlling any of position value. It can be used in many applications with their valtage/current/potantiometer process input, alarm functions and serial communication unit.

Some application fields which they are used are below:

### Application Fields

Glass  
Plastic  
Petro-chemistry  
Textile  
Automotive  
Machine production industries  
etc...

## 1.1 General Specifications



## 1.2 Installation

A visual inspection of this product for possible damage occurred during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and separate the electrical connection of the device from the system.

The unit is normally supplied without a power switch or a fuse. Use power switch and fuse as required.

Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

Never attempt to disassemble, modify or repair this unit. Tampering with the unit may result in malfunction, electric shock or fire.

Do not use the unit in combustible or explosive gaseous atmospheres.

During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

Montage of the product on a system must be done with it's mounting clamp. Do not do the montage of the device with inappropriate mounting clamp. Be sure that device will not fall while doing the montage.

It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

## 1.3 Warranty

OPKON makes a limited warranty against manufacturing defects concerning the products to the end users of the products.

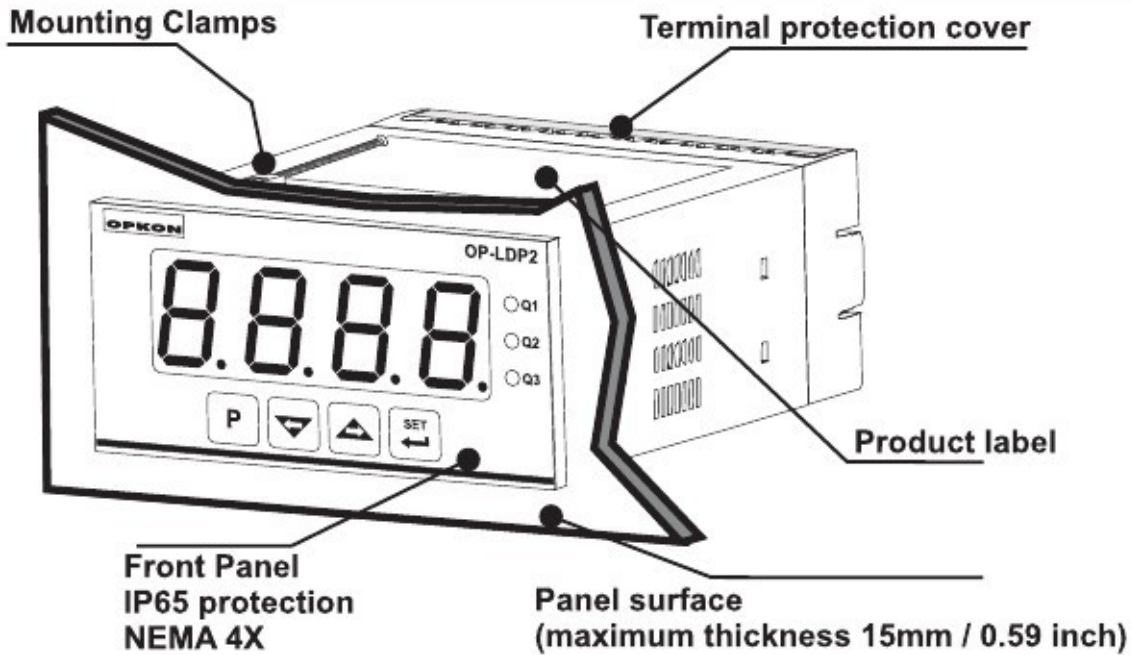
## 1.4 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.

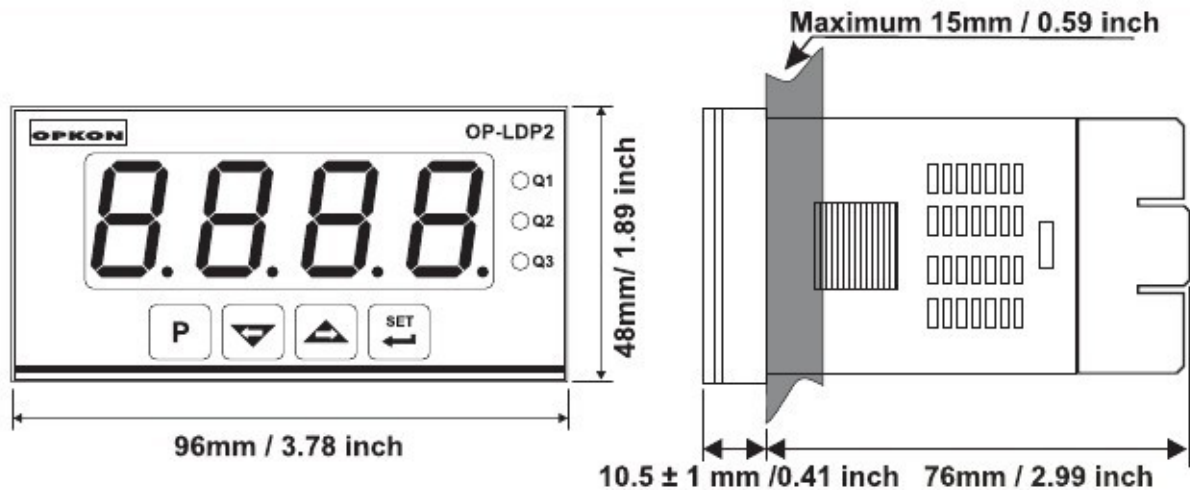
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.



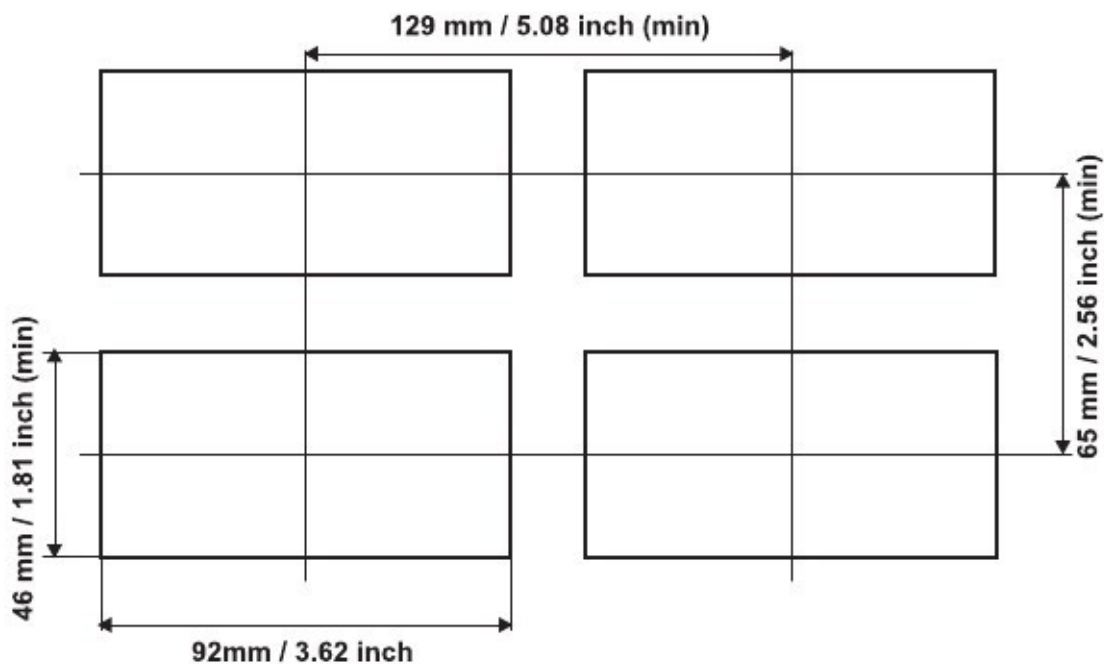
## 2 General Description



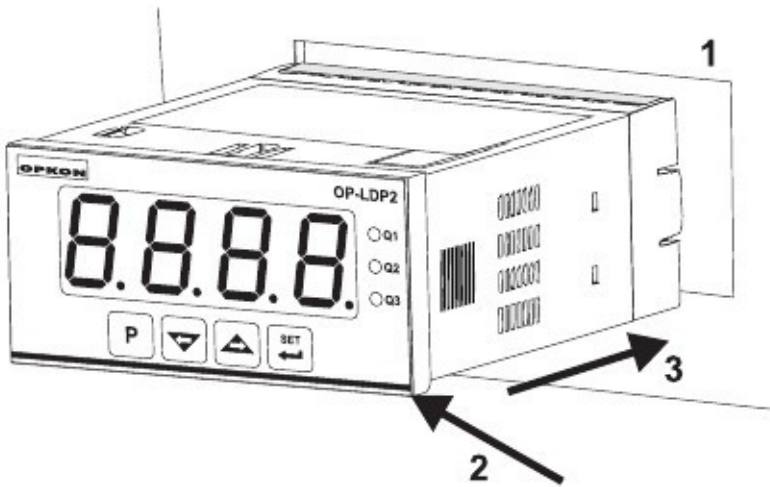
### 2.1 Front View and Dimensions



### 2.2 Panel Cut-Out



## 2.3 Panel Mounting

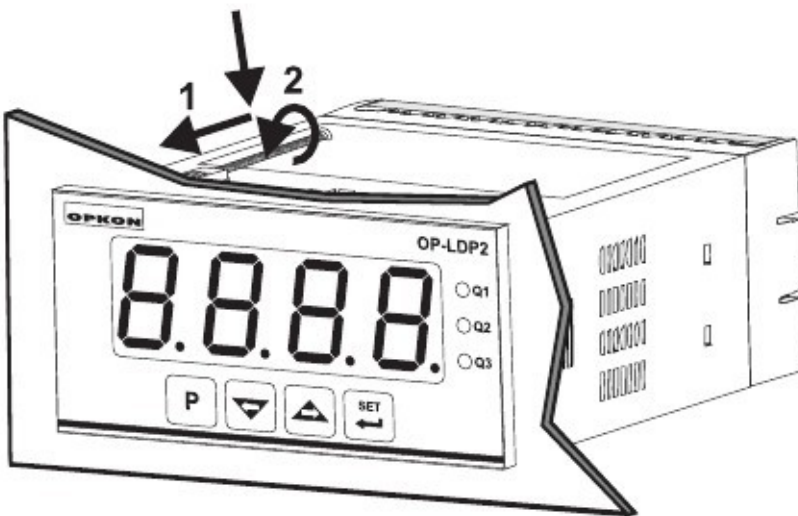


1-Before mounting the device in your panel, make sure that the cut-out is of the right size.

2-Check front panel gasket position

3-Insert the device through the cut-out. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.

## 2.4 Installation Fixing Clamp

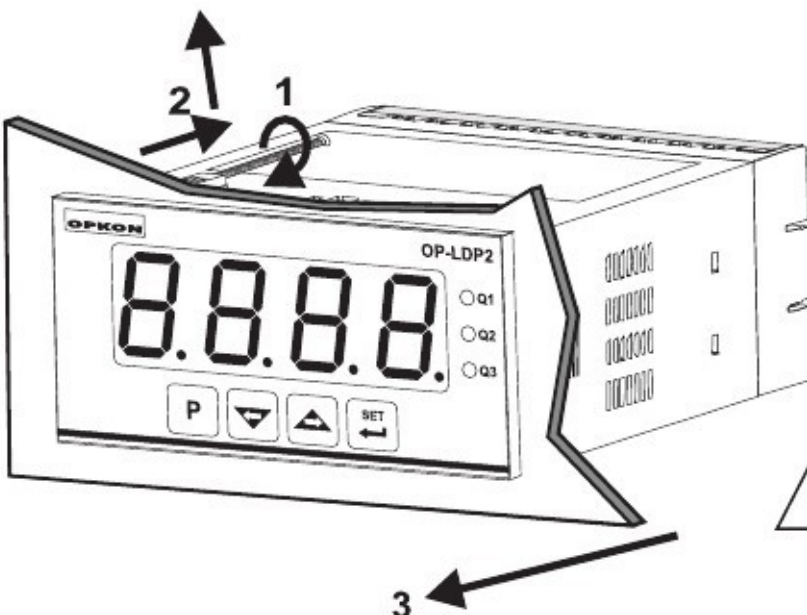


The unit is designed for panel mounting.

1-Insert the unit in the panel cut-out from the front side.

2- Insert the mounting clamps to the holes that located top and bottom sides of device and screw up the fixing screws until the unit completely immobile within the panel

## 2.5 Removing from the Panel



1-Loosen the screws.

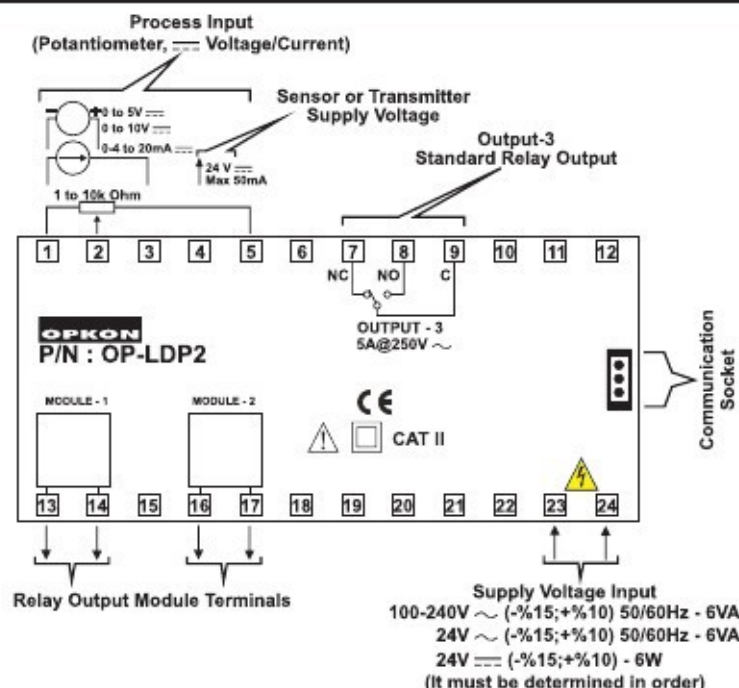
2-Pull mounting clamps from top and bottom fixing sockets.

3-Pull the unit through the front side of the panel



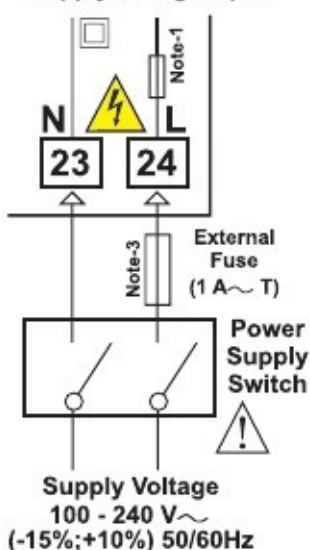
**Before starting to remove the unit from panel, power off the unit and the related system.**

### 3. Electrical Wiring Diagram

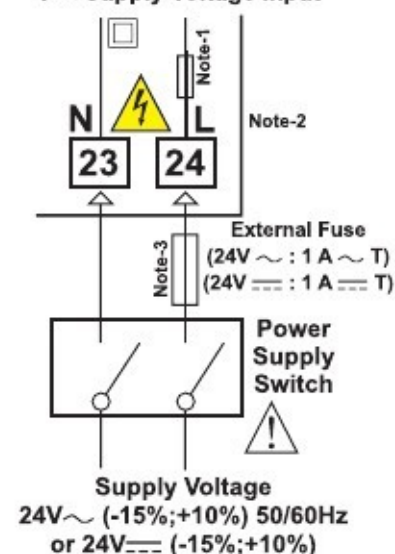


#### 3.1 Supply Voltage Input Connection of the Device

Connection of Universal Supply Voltage Input



Connection of Low Voltage 24 V ~ Supply Voltage Input



**Note-1** :There is an internal 33R Ω fusible flameproof resistor in 100-240 V ~ 50/60Hz supply voltage input

There is an internal 4R7 Ω fusible flameproof resistor in 24V ~ 50/60Hz , 24V =

**Note-2** : "L" is (+) , "N" is (-) for 24V = supply voltage

**Note-3** : External fuse is recommended.

Make sure that the power supply voltage is the same indicated on the instrument.

Switch on the power supply only after that all the electrical connections have been completed. Supply voltage range must be determined in order. While installing the unit, supply voltage range must be controlled and appropriate supply voltage must be applied to the unit. Controlling prevents damages in unit and system and possible accidents as a result of incorrect supply voltage.

There is no power supply switch on the device. So a power supply switch must be added to the supply voltage input. In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument. Power supply switch shall be easily accessible by the user.

Power switch must be two poled for seperating phase and neutral. On/Off condition of power switch is very important in electrical connection. On/Off condition of power switch must be signed for preventing the wrong connection.

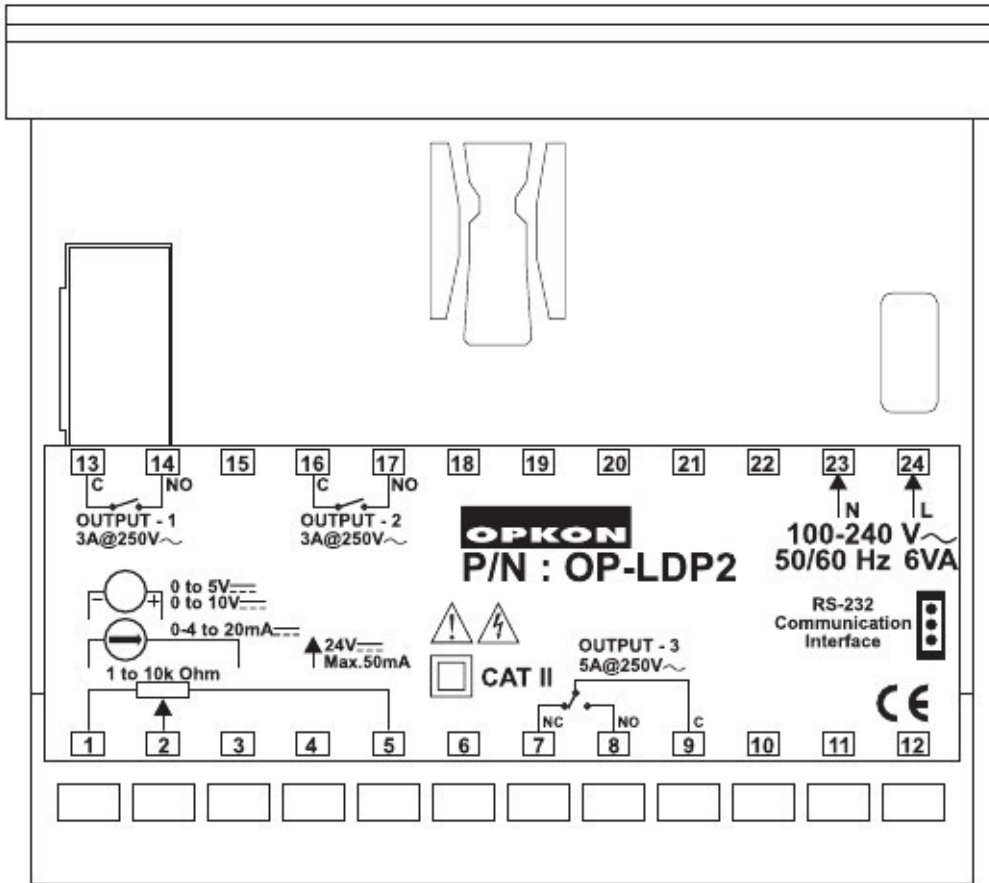
If an external fuse is used, it must be on phase connection in ~ supply input.

If an external fuse is used, it must be on (+) line connection in = supply input.

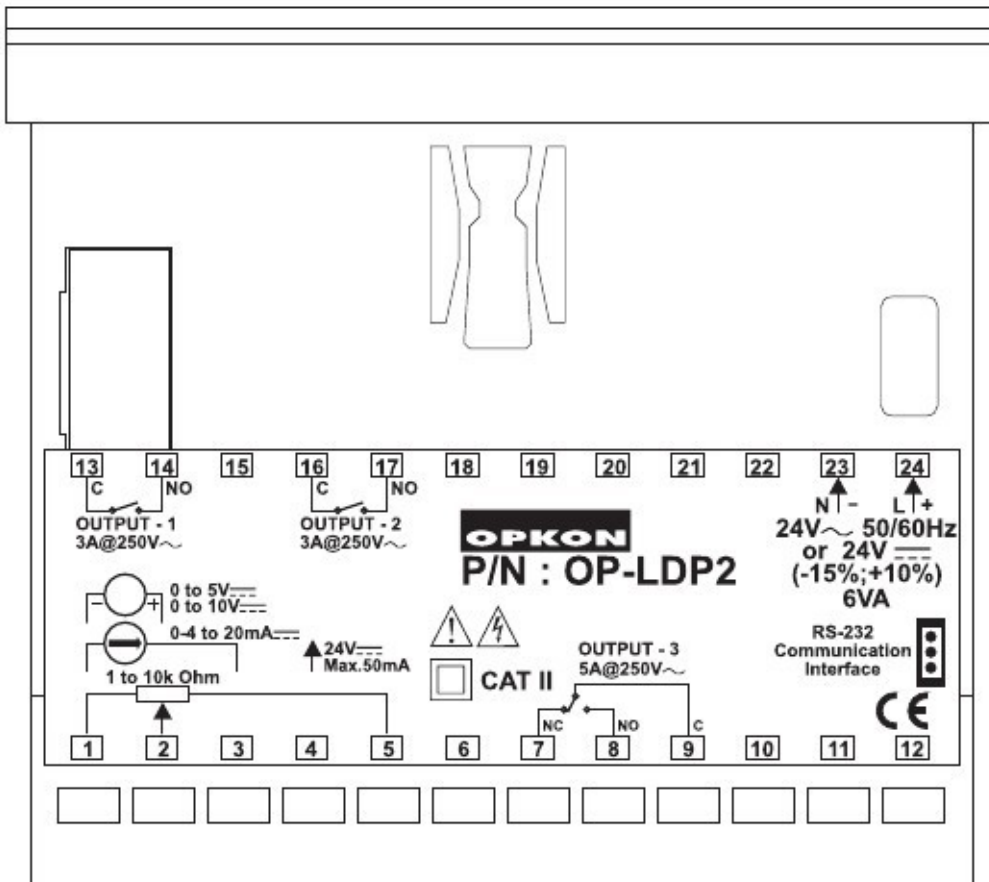
The instrument is protected with an internal fuse (Please refer to Note1 for information). In case of failure it is suggested to return the instrument to the manufacturer for repair.



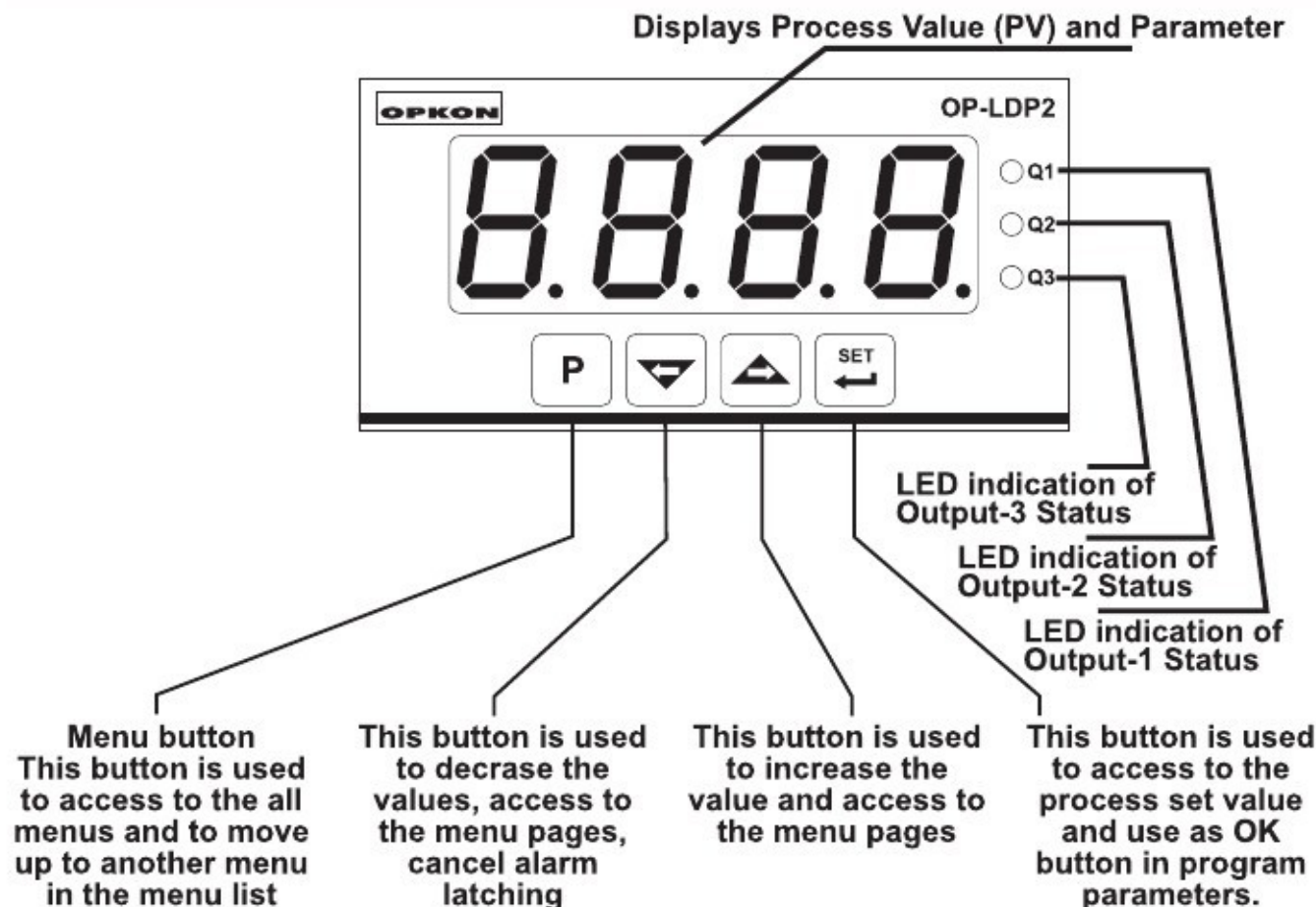
Example-1: OP-LDP2.1.43.1.1/01.01/0.0.0.0



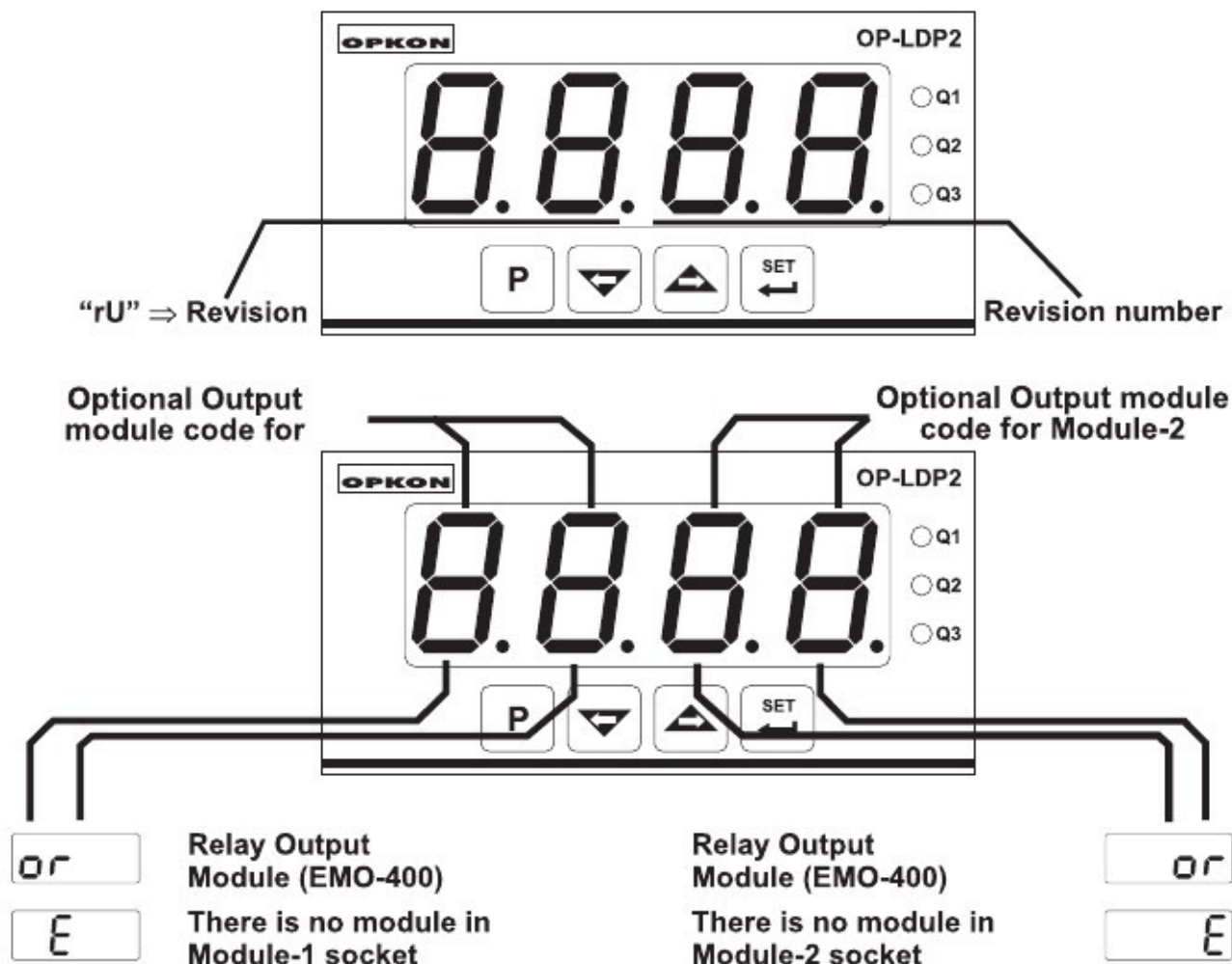
Example-2: OP-LDP2.2.43.1.1/01.01/0.0.0.0



## 4. Front Panel Definition

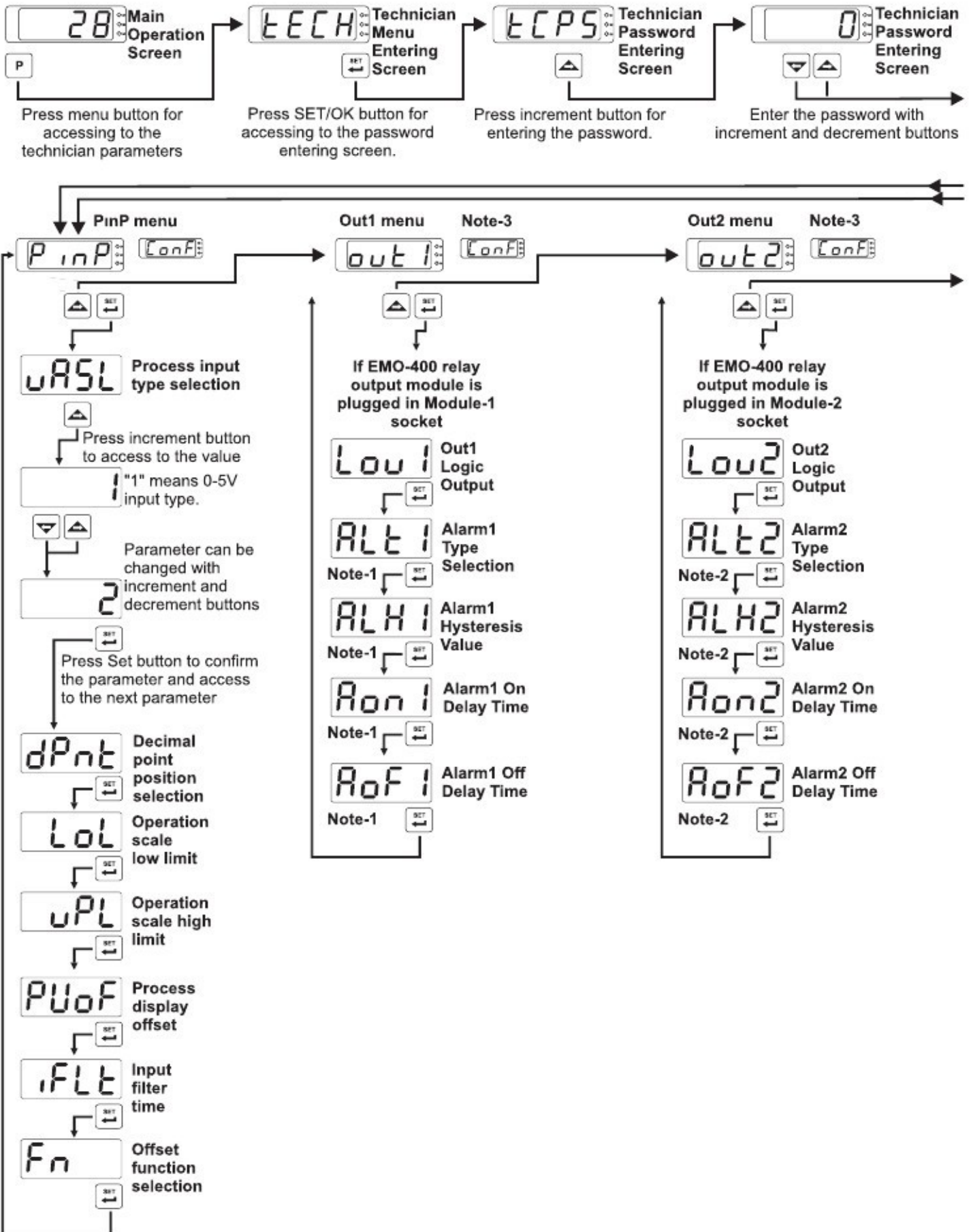


### 4.1 Observation of Optional Modules and Software Revision on the Displays





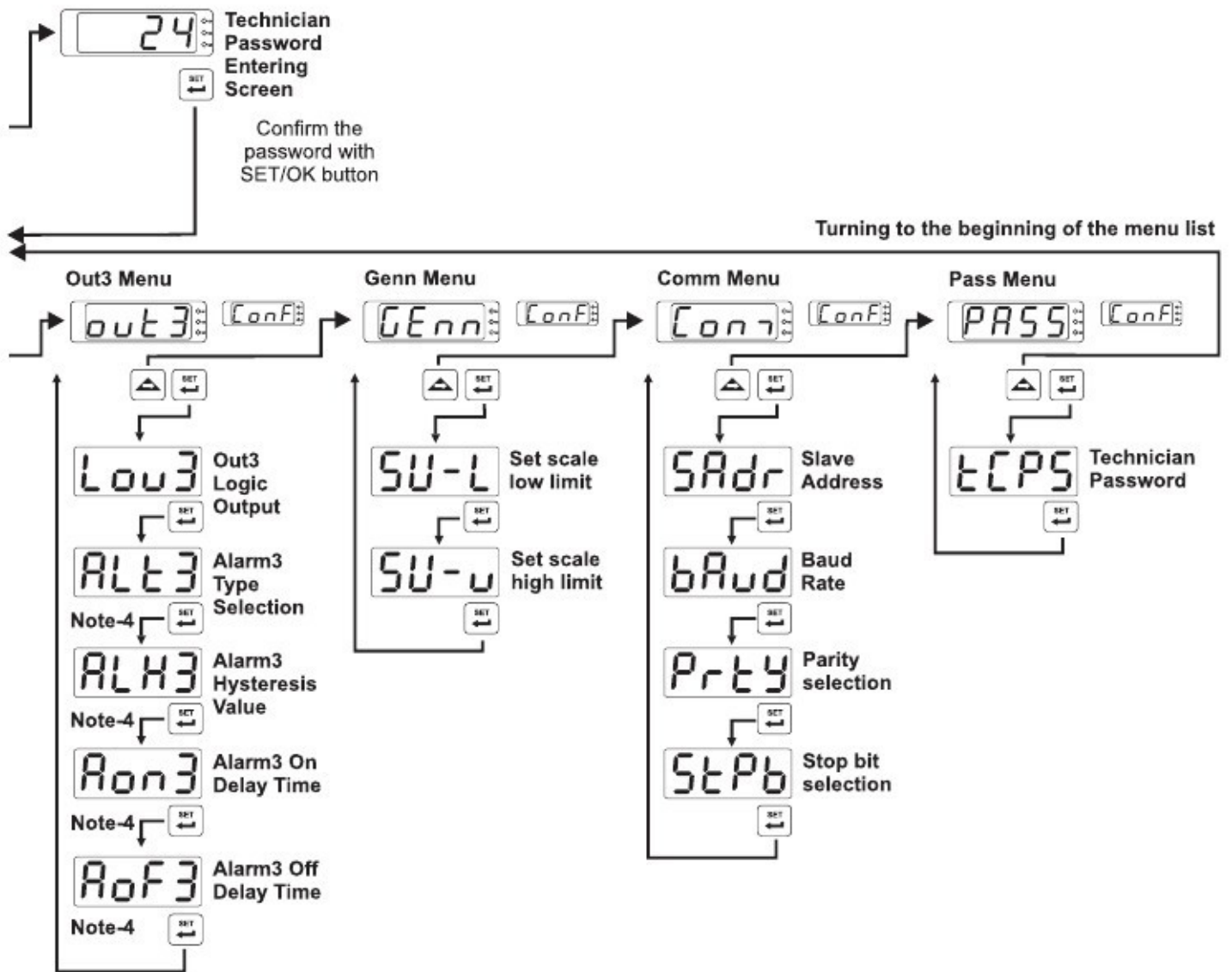
## 4.2 Easy Access Diagram for Technician Parameters



**Note-1 :** It can be observed if logic output function Lou1 is selected 0 as alarm output.

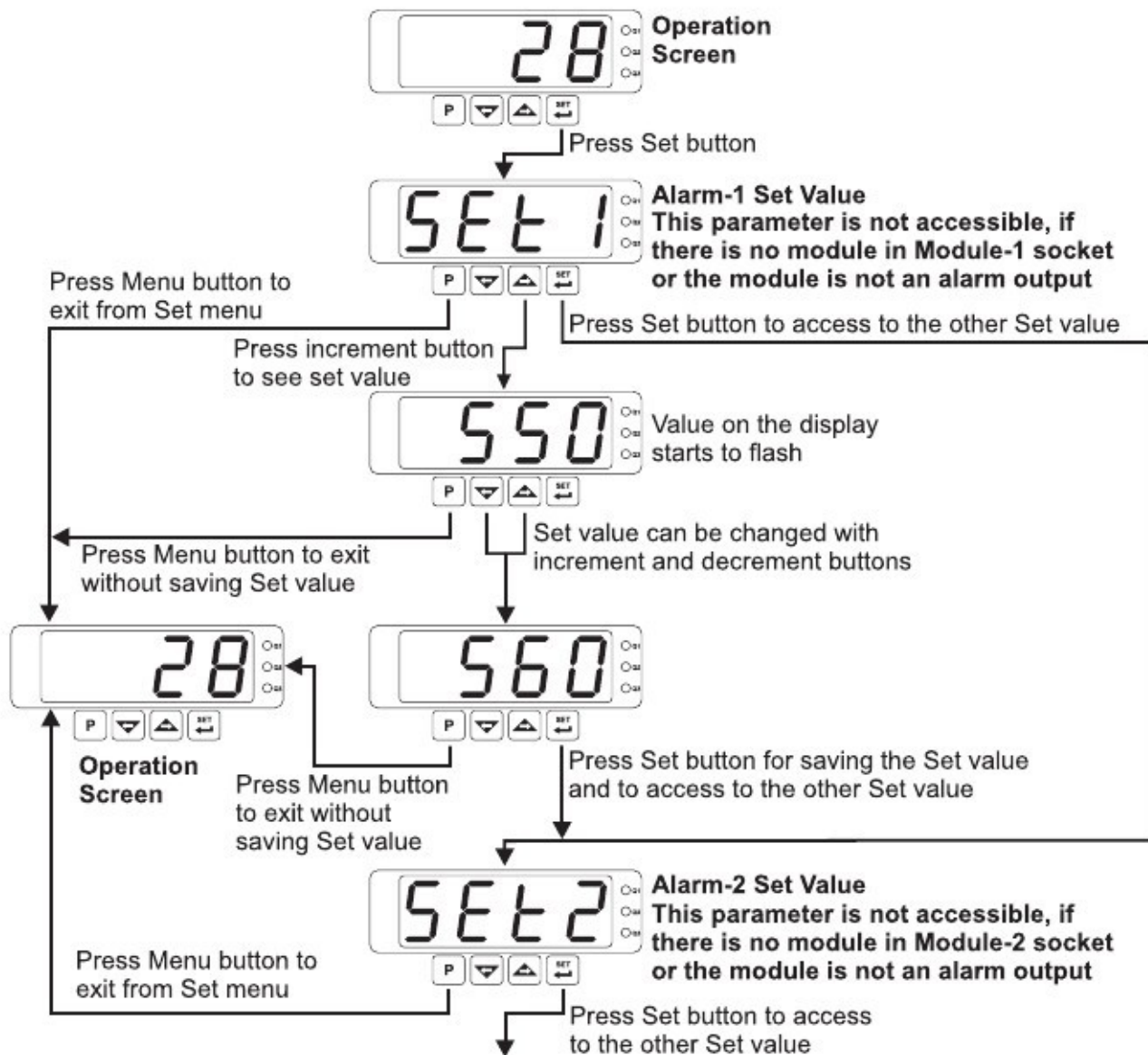
**Note-2 :** It can be observed if logic output function Lou2 is selected 0 as alarm output.

**Note-3 :** This menu can not be observed if there is no module in the module socket.



**Note-4 :** It can be observed if logic output function `Low3` is selected `0` as alarm output.

### 4.3 Adjustment of Alarm Set Values



### 4.4 Parameters

Parameters are divided into two groups. These are Alarm Set and Technician parameters. Technician parameters are grouped into subgroups according to their functions. The subgroups are named as menu pages.

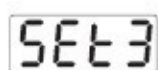
#### 4.4.1 Alarm Set Parameters



If EMO-400 Relay output module is plugged in Module-1 socket and output is configured as an alarm output, this parameter defines the set value of the alarm output.



If EMO-400 Relay output module is plugged in Module-2 socket and output is configured as an alarm output, this parameter defines the set value of the alarm output.



If OUTPUT-3 relay output module is configured as alarm output, this parameter defines the set value of the alarm output.

Set1,2 and 3 can be adjusted from minimum value of set scale **5U-L** to maximum value of set scale **5U-U**



## 4.4.2 Technician Parameters

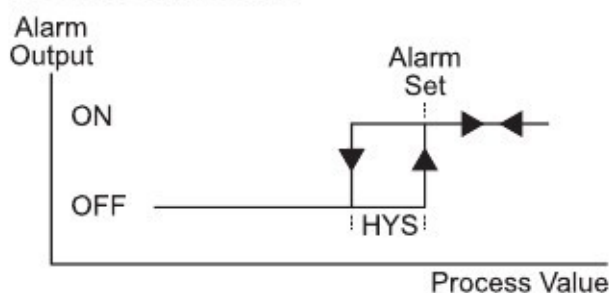
### 4.4.2.1 Process Input Type and Relevant Parameters with Process Input

<b>uASL</b>	It defines process input type and scale.	<b>dPnt</b>	Defines point position for displays.
<input type="text" value="1"/>	0-5V $\equiv$ (-1999 ; 9999)	<input type="text" value="0"/>	No point
<input type="text" value="2"/>	0-10V $\equiv$ (-1999 ; 9999)	<input type="text" value="1"/>	"0.0"
<input type="text" value="3"/>	0-20mA $\equiv$ (-1999 ; 9999)	<input type="text" value="2"/>	"0.00"
<input type="text" value="4"/>	4-20mA $\equiv$ (-1999 ; 9999)	<input type="text" value="3"/>	"0.000"
<b>LoL</b>	Minimum value of operating scale. It can be changed according to input type and scale of the process.		
<b>uPL</b>	Maximum value of operating scale. It can be changed according to input type and scale of the process.		
<b>PUoF</b>	Display offset for process value. It can be adjusted from -10% to +10% of scale. The defined value is added to process value.		
<b>.fLT</b>	Defines filter time for input signal. It can be adjusted from 0.0 to 900.0.		
<b>Fn</b>	It decides if offset function is active or not.		
<input type="text" value="YES"/>	Offset function is active.		
<input type="text" value="no"/>	Offset function is not active.		

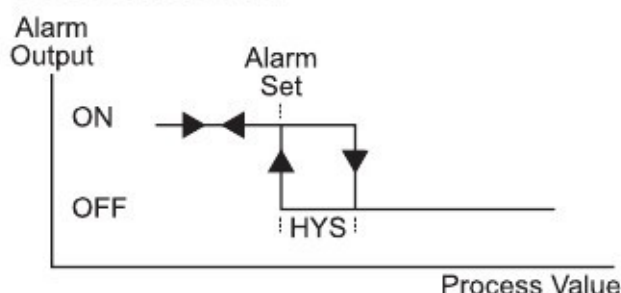
### 4.4.2.2 Module-1 Configuration Parameters

<b>LoU1</b>	It determines logic output function of the output module in Module-1 socket
<input type="text" value="0"/>	Alarm output
<input type="text" value="1"/>	Sensor break alarm output
<input type="text" value="2"/>	Output is active when the process value is out of the band which is defined with minimum value of operating scale "LoL" and maximum value of operating scale "uPL".
<b>ALt1</b>	It determines alarm type. It is active if logic output function of Module-1 is adjusted alarm output. It can be adjusted as "0 -> Process high alarm" or "1 -> Process low alarm".

#### Process high alarm



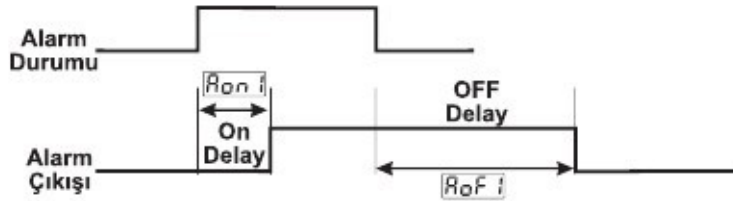
#### Process low alarm



**ALH 1** Alarm- 1 hysteresis value. It is active if logic output function of Module-1 is selected alarm output. It can be adjusted from 0% to 50% of process input scale ( *UPL - LOL* ).

**ROn 1** Alarm on delay time. It can be adjusted from 0 to 9999 seconds. It is active if logic output function of Module-1 is alarm output.

**ROF 1** Alarm off delay time. It can be adjusted from 0 to 9998 seconds. When the value is greater than 9998, " *TECH* " is seen on the display. It means alarm latching output is selected. It is active if logic output function of Module-1 is alarm output.



#### 4.4.2.3 Module-2 Configuration Parameters

**LOU2** It determines logic output function of the output module in Module-2 socket. It is same as " *LOU 1* ".

**ALT2** Defines alarm type. - It is same as " *ALT 1* ".

**ALH2** Alarm-2 hysteresis value. It is same as " *ALH 1* ".

**ROn2** Alarm on delay time. It is same as " *ROn 1* ".

**ROF2** Alarm off delay time. It is same as " *ROF 1* ".

#### 4.4.2.4 Output-3 Configuration Parameters

**LOU3** It determines logic output function of the output-3. It is same as " *LOU 1* ".

**ALT3** Defines alarm type. - It is same as " *ALT 1* ".

**ALH3** Alarm-3 hysteresis value. It is same as " *ALH 1* ".

**ROn3** Alarm on delay time. It is same as " *ROn 1* ".

**ROF3** Alarm off delay time. It is same as " *ROF 1* ".

#### 4.4.2.5 General Parameters

**SU-L** Minimum value for process set and alarm set values. It is named as low limit of set scale. It can be adjusted from low limit of input selected with " *ISSL* " parameter to " *SU-U* " parameter.

**SU-U** Maximum value for process set and alarm set values. It is named as high limit of set scale. It can be adjusted from " *SU-L* " to high limit of input selected with " *ISSL* " parameter.

#### 4.4.2.6 Parameters for Configuration of Serial Communication

**SAdr**

Communication Accessing Address. It can be adjusted from 1 to 247.

**bAud**

Communication Baud Rate. It can be adjusted as "0 -> 1200 Baud Rate", "1 -> 2400 Baud Rate", "2 -> 4800 Baud Rate", "3 -> 9600 Baud Rate" or "4 -> 19200 Baud Rate".

**PrtY**

Parity Selection for Communication. It can be adjusted as "0 -> No parity", "1 -> Odd parity" or "2 -> Even parity".

**StPb**

Stop Bit Selection for Communication. It can be adjusted as "0 -> 1 Stop bit" or "1 -> 2 Stop bits".

#### 4.4.2.7 Technician Password

**TCPS**

It is used for accessing to the technician parameters. It can be adjusted from 0 to 9999. If it is "0"; there is no password protection while entering to the technician parameters.

**If it is different from "0" and user wants to access to the technician parameters;**

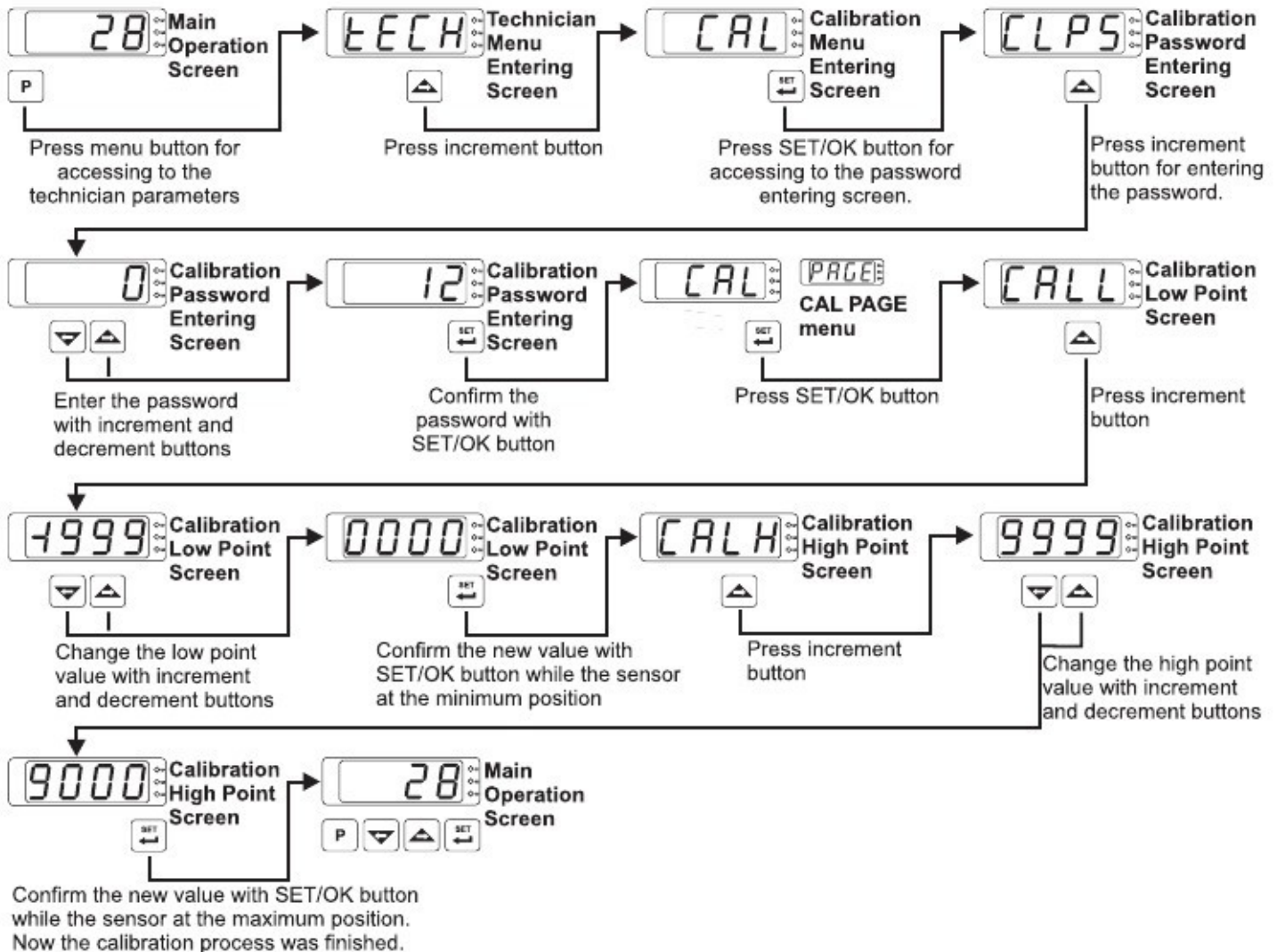
**1-** If user does not enter the password correctly;

It turns to operation screen without entering to operator parameters.

**2-** When "TCPS" in top display and "0" in bottom display, if user presses SET button without entering "TCPS" password (For observing parameters)

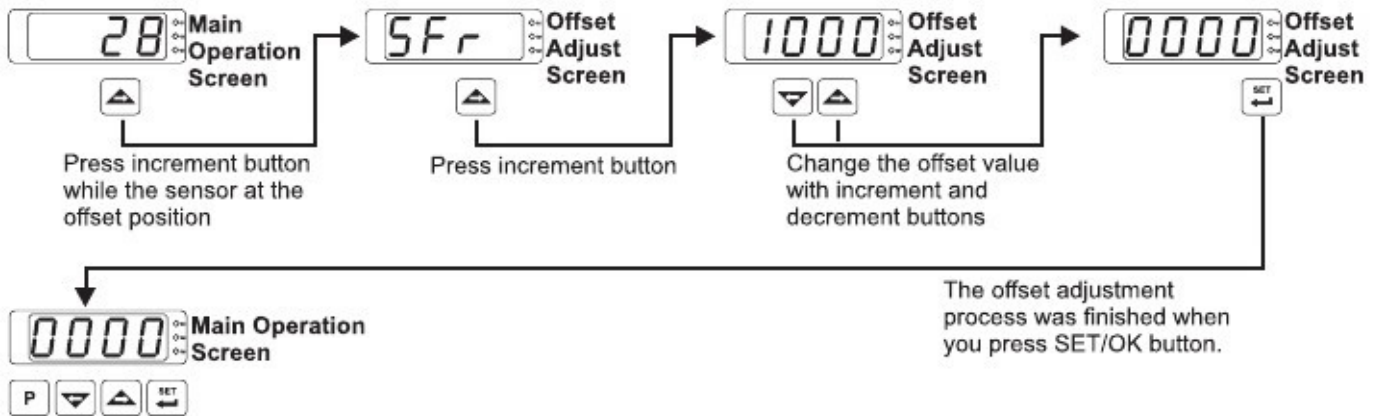
User can see all menus and parameters except Technician Password menu ("Pass Conf") but parameters can not be changed.

#### 4.5 Calibration





## 4.6 Offset Adjustment



## 5. Ordering Information

<b>OP-LDP2</b> (96x48 1/8 DIN)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
				1	/			/	0	0	0	0

A	Supply Voltage
1	100-240V $\sim$ (-%15;+%10) 50/60Hz
2	24 V $\sim$ (-%15;+%10) 50/60Hz    24V $\equiv$ (-%15;+%10)

BC	Input Type	Scale
42	0...5 V $\equiv$	-1999,9999
43	0...10 V $\equiv$	-1999,9999
44	0...20 mA $\equiv$	-1999,9999
45	4...20 mA $\equiv$	-1999,9999

D	Serial Communication	Product Code
0	None	-
1	RS-232	EMC-400
2	RS-485	EMC-410

E	Output-1
1	Relay Output ( 5A@ 250V $\sim$ at Resistive Load)

FG	Module-1	Product Code
00	None	-
01	Relay Output Module ( 3A@250V $\sim$ at Resistive Load)	EMO-400

HI	Module-2	Product Code
00	None	-
01	Relay Output Module ( 3A@250V $\sim$ at Resistive Load)	EMO-400

All order information of OP-LDP2 are given on the table at left. User may form appropriate device configuration from information and codes that at the table and convert it to the ordering codes.

Firstly, supply voltage then output modules and other specifications must be determined. Please fill the order code blanks according to your needs.

Please contact us, if your needs are out of the standards.



$\sim$   $\Rightarrow$  Vac,

$\equiv$   $\Rightarrow$  Vdc

$\sim$   $\Rightarrow$  Vdc or Vac can be applied

## 6. Specifications

<b>Device Type</b>	: Position Measurement and Control Unit
<b>Housing&amp;Mounting</b>	: 96mm x 48mm x 86.5mm 1/8 DIN 43700 plastic housing for panel mounting. Panel cut-out is 92x46mm.
<b>Protection Class</b>	: NEMA 4X (IP65 at front, IP20 at rear).
<b>Weight</b>	: Approximately 0.21 Kg.
<b>Environmental Ratings</b>	: Standard, indoor at an altitude of less than 2000 meters with none condensing humidity.
<b>Storage/Operating Temperature</b>	: -40 °C to +85 °C / 0 °C to +50 °C.
<b>Storage/Operating Humidity</b>	: 90 % max. (None condensing)
<b>Installation</b>	: Fixed installation.
<b>Over Voltage Category</b>	: II.
<b>Pollution Degree</b>	: II, office or workplace, none conductive pollution.
<b>Operating Conditions</b>	: Continuous.
<b>Supply Voltage and Power</b>	: 100 - 240 V ~ (-%15 / +%10) 50/60 Hz. 6VA 24 V ~ (-%15 / +%10) 50/60 Hz. 6VA 24 V === (-%15 / +%10) 6W
<b>Process Inputs</b>	: Potentiometer, === Voltage, === Current
<b>Potentiometer Input</b>	: 1-10kohm.
<b>=== Voltage Input</b>	: Selectable by parameters 0...5V === , 0...10V ===
<b>=== Current Input</b>	: Selectable by parameters 0...20mA === , 4...20mA ===
<b>Accuracy</b>	: ± 0,5% of full scale for Potentiometer, ± 0,25% of full scale for Voltage, ± 0,70% of full scale for Current.
<b>Sampling Cycle</b>	: 10 samples per second.
<b>Input Filter</b>	: 0.0 to 900.0 seconds.
<b>Control Form</b>	: Programmable ON / OFF
<b>Standard Relay Output</b>	: 5A@250V~ at resistive load. (Electrical Life : 100.000 Operation (Full Load))
<b>Output Modules</b>	: EMO-400 Relay Output Module (3A@250V~ at resistive load)
<b>Standard Communication Module</b>	: EMC-400 RS-232 Communication Module
<b>Optional Communication Module</b>	: EMC-410 RS-485 Communication Module
<b>Communication Protocol</b>	: MODBUS-RTU.
<b>Process Display</b>	: 20.3 mm Red 4 digit LED display
<b>Led Indicators</b>	: Q1 / Q2 / Q3 (Outputs) LEDs
<b>Approvals</b>	: GOST-R

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