

1. General

These LCD-/LED-voltmeter modules are 3 ½ digit modules for application in Voltmeter and Amperemeter.

They are suitable for measuring DC voltage up to max. 500 V, depending of the wiring of Ra and Rb. You can also measure DC current of 0.2 mA up to max. 2 A, depending of the rating of the used shunts at a max. voltage of the measuring circuit of 35 V DC.

Another application of the modules instead of the described is not allowed.

The models LDP-340 and LDP-140 are additionally provided with a backlight.

2. Safety regulations

EMC: EN 50081-1; EN 50082-1

Before connecting the modules, read and take note of the following safety regulations and instruction manual.

Damages resulting from failure to observe these safety precautions are exempt from any legal claims whatever.

- * During the measurement of voltages over $30 V_{\text{rms}}$ ($= 42 V_{\text{pp}}$) or $60 V$ DC with respective wiring of the module take care that the circuit, in which you use the module follows the relevant safety regulations of the IEC-1010.
- * Do not use these modules in installation with overvoltage category III according IEC 664. The modules are not protected against arcing (IEC 1010-2-031, part 13.101)
- * Use caution when working above $25 V$ AC or $35 V$ DC. Even such voltage poses a shock hazard.
- * Before you change the measuring range (another wiring of Ra and Rb) remove the probe tips from the circuit.

• **Measuring instruments don't belong to children hands**

3. Technical Data

max. input voltage
(basic instrument,
Ra = open;
Rb = shorted)

199,9 mV DC

max. display

1999 (3 ½-digit) with automatic
polarity indication

Display

LCD i. e. LED elements

Measuring principle	dual slope A/D converter
Cipher height	LDP-135/140: 13 mm LDP-335/340: 8 mm LDP-235/240: 14 mm
Overflow indication	“1” is displayed
Sampling rate	2...3 times per second
Input impedance	> 100 MΩ
Accuracy	± 0,5 % (at 23° C ± 5° C and a relative humidity of < 80 %)
Power dissipation	1 mA DC (LDP-135/335) 30 mA DC (LDP-340) 48 mA DC (LDP-140) 50...60 mA DC (LDP-235/240)
Decimal point	selectable with jumper
Mounting holes	LDP-135/140: 54,5 mm (W) x 38,8 (H) mm LDP-335/340: 43,5 mm (W) x 19,5 (H) mm LDP-235/240: 69,5 mm (W) x 46,5 (H) mm
Supply voltage	9 V DC (LCD) 9...12 V DC (LED)

Dimensions:

LDP-135/140: 68,5 x 40,5 x 18 mm

LDP-335/340: 47 x 20 x 16 mm

LDP-235/240: 83 x 49,5 x 22 mm

4. Operation

Before operating take care that the module is enough isolated and the air section and leakage path according VDE 0411 i. e. VDE 0410 and IEC-1010-1 is guaranteed.

Important!

Please use only soldering irons with max 20 W!

Connect a voltage of

- 9 V DC (LDP-135 / 140 / 335 / 340 LCD)

- 9 ... 12 V DC (LDP-235 / 240 LED) to the supply input (9 V battery).

Please consider the polarity.

Caution!

A simultaneously supply of the module and measuring of the supply voltage is not possible.

Operation of several modules with same power supply is not possible (one module = one power supply, i. e. 9 V battery).

4.1. Changing the voltage divider

- a) The voltage in the following chart can be added and the jumper plug accordingly displayed if required (resistors are optional components).

LDP-135 / 140 LCD:

Max. measuring voltage	Required voltage divider	Decimal point
200 mV	---	Short P3
2V	Ra = 1M Ω Rb = 9 M Ω	Short P1
20V	Ra = 100k Ω Rb = 9,9M Ω	Short P2
200V	Ra = 10k Ω Rb = 9,99M Ω	Short P3
500V	Ra = 1k Ω Rb = 9,999M Ω	

LDP 235 / 240 LED:

Max. measuring voltage	Required voltage divider	Decimal point
200 mV	---	Short P3
2V	Ra = 9M Ω Rb = 1 M Ω	Short P1
20V	Ra = 9,9 M Ω Rb = 100k Ω	Short P2
200V	Ra = 9,99M Ω Rb = 10k Ω	Short P3
500V	Ra = 9,999M Ω Rb = 1k Ω	

LDP 335 / 340 LCD:

Max. measuring voltage	Required voltage divider	Decimal point
200 mV	---	Short P3
2V	Ra = 9 MΩ Rb = 1 MΩ	Short P1
20V	Ra = 9,9 MΩ Rb = 100 kΩ	Short P2
200V	Ra = 9,99 MΩ Rb = 10 kΩ	Short P3
500V	Ra = 9,999 MΩ Rb = 1 kΩ	

Resistors Ra and Rb are ½ Watt; 0,5 % metal-foil resistors.

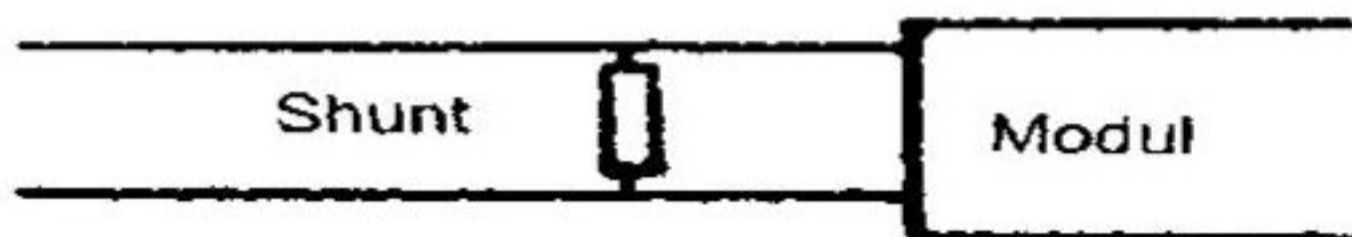
- b) Connect module to an external DC voltage source.
- c) The accuracy on all ranges except 200 mV range should be adjusted with a calibrated voltage of 50% of the selected range (i. e. 100 V for 200 V range). Adjust potentiometer for equal reading of scale.
- d) Connect the voltage to be measured to terminals VIN and GND (4). Connect DC voltages to the input terminals only.

4.3. Measuring DC current

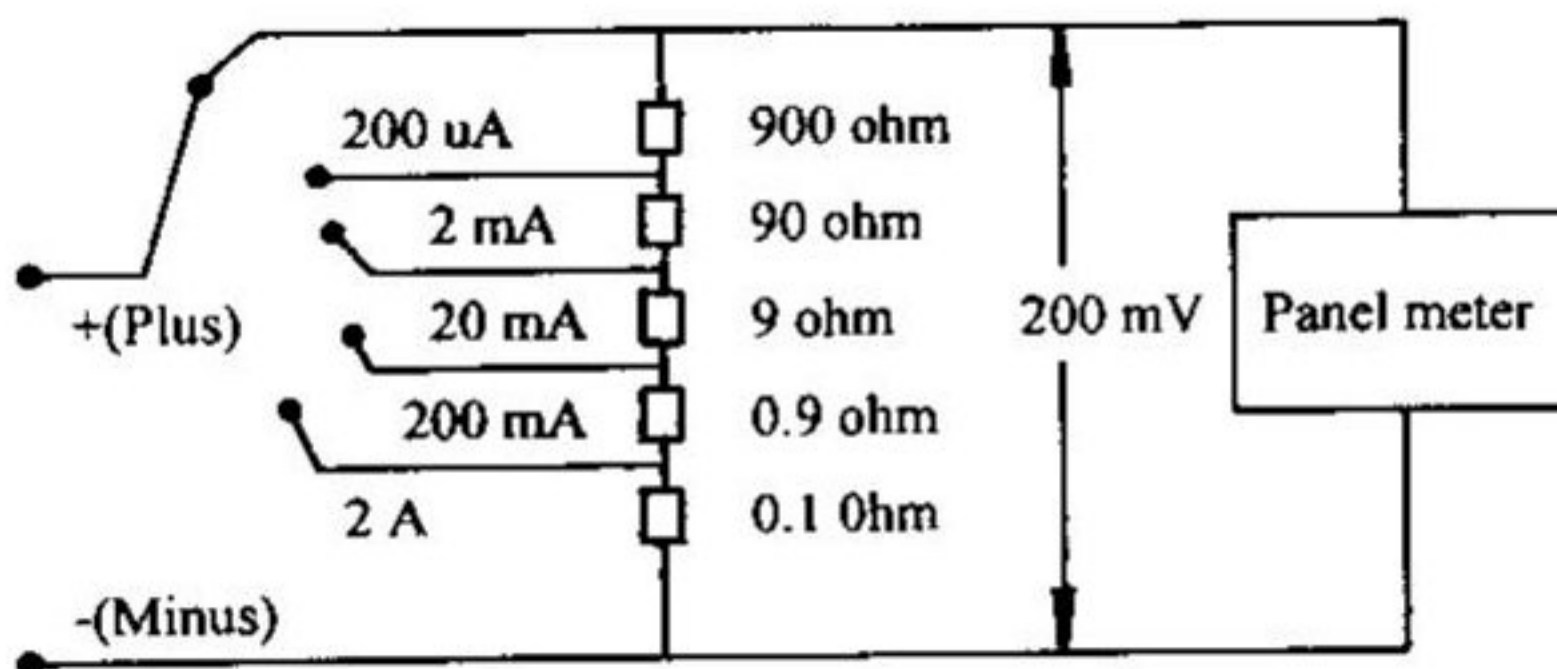
To measure DC current, wiring measuring input (4) as per following table:

Range	Decimal-point	Shunt
200 mA	Short P3	1 k Ω
2 mA	Short P1	100 Ω
20 mA	Short P2	10 Ω
2000 mA		0,1 Ω

Caution! The max. voltage should not exceed 35 V DC in the circuit. The measuring input for current/voltage is not protected.

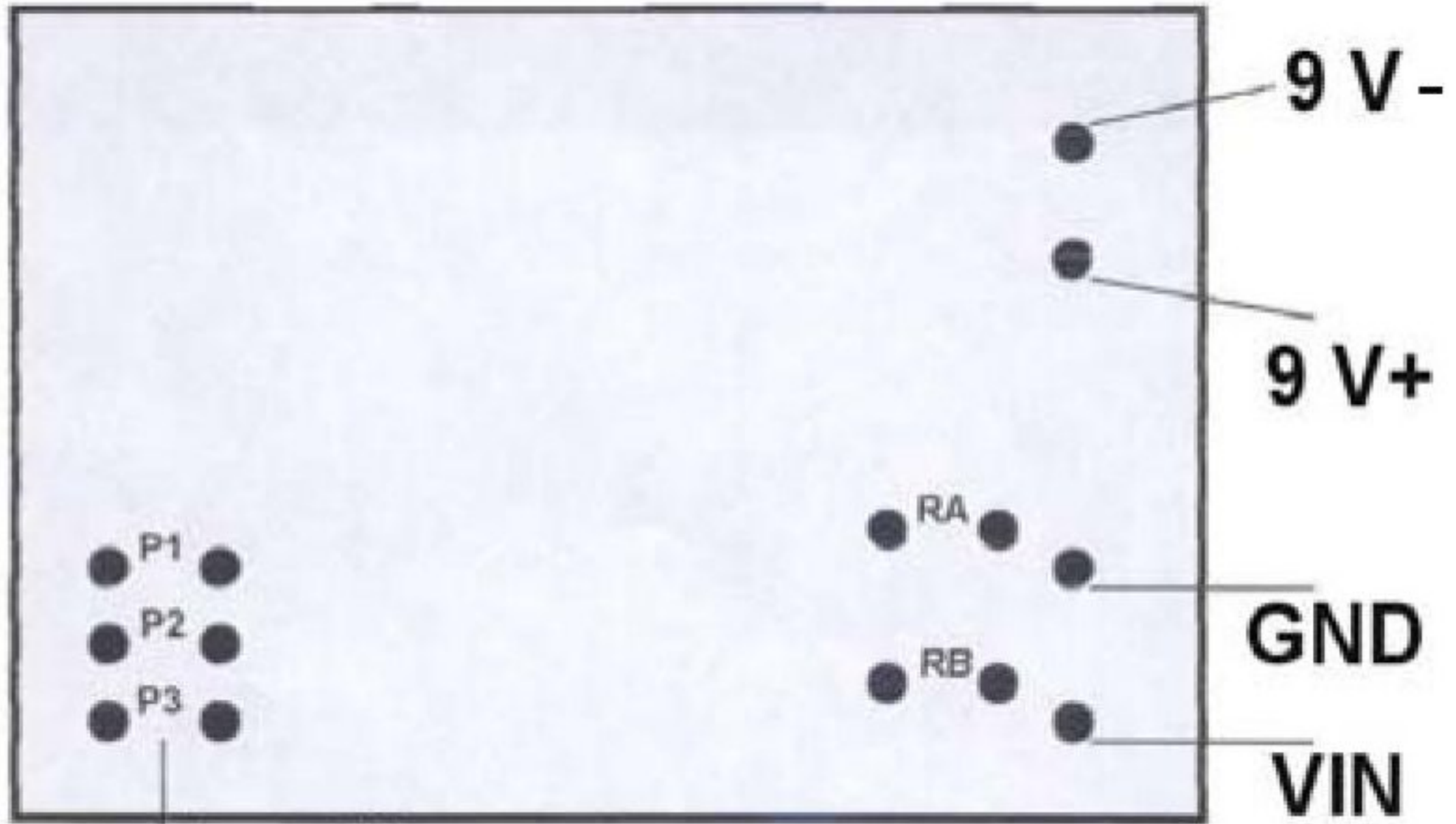


4.3. Recommended circuit configurations



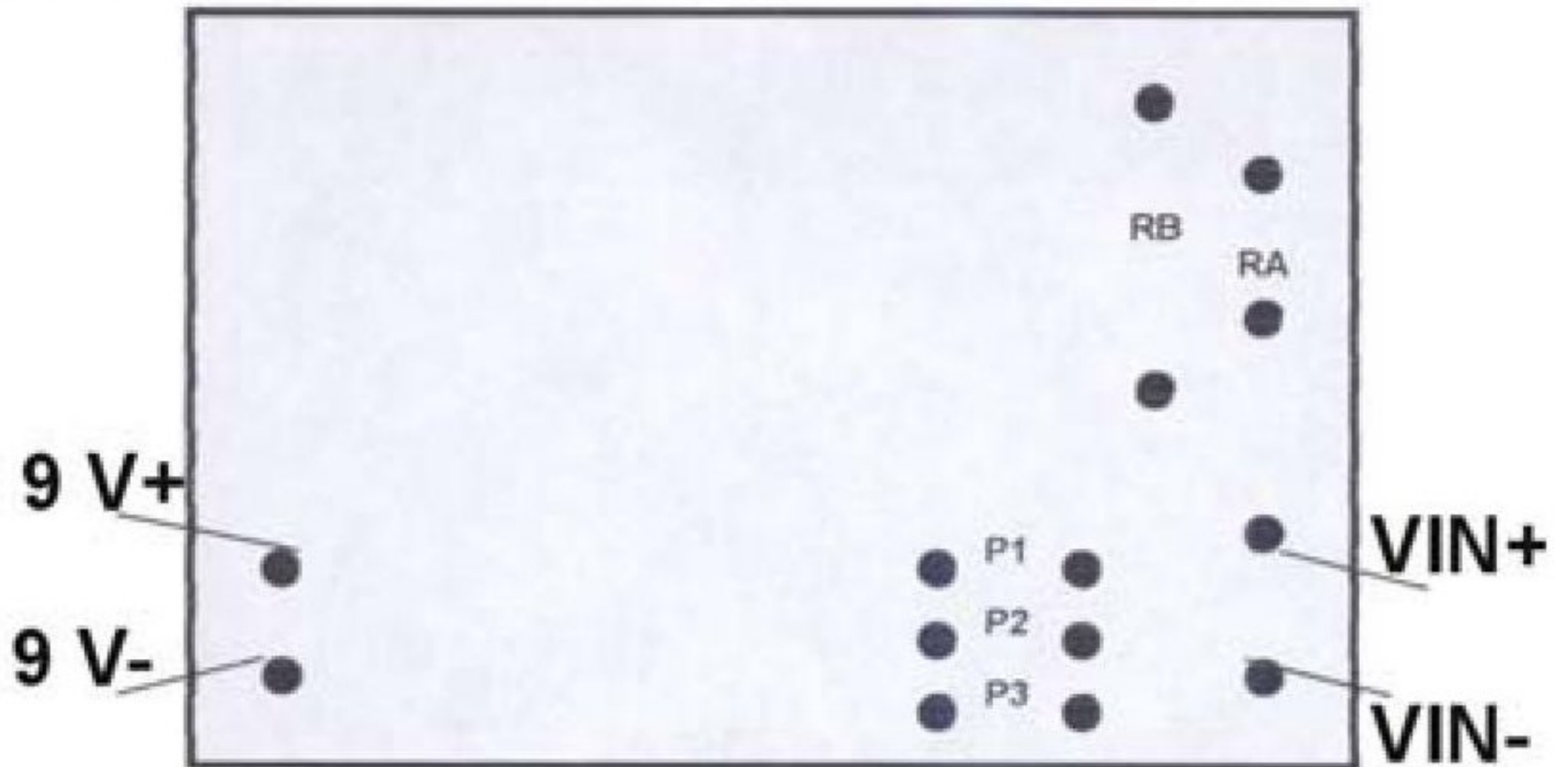
5. Connecting diagram

LDP-135 / LDP-140 Back-view:

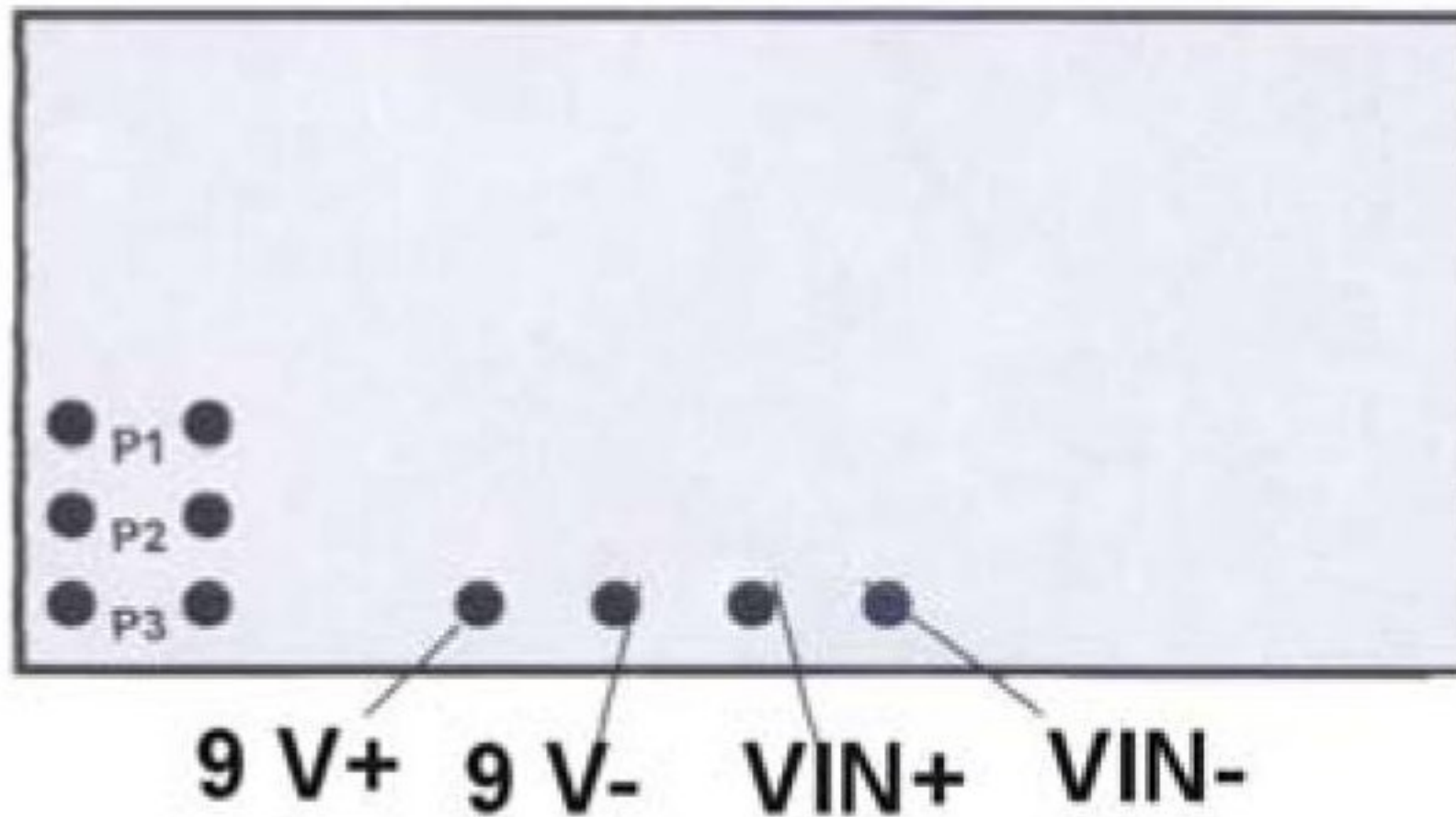


For setting
the decimal-point

LDP-235 / LDP-240 Back-view:



LDP-335 / LDP-340 LCD Back-view:



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This manual is according the latest technical knowing. Technical changing which are in the interest of progress reserved.

We herewith confirm that the units are calibrated by the factory according to the specifications as per the technical specifications. We recommend to calibrate the unit again, after 1 year.