Panelmeter AP 01

Technical documentation U-19

AP01-05-x-...
AP01-06-x-...
AP01-07-x-...
AP01-08-x-...
AP01-09-x-...
AP01-10-x-...
AP01-11-x-...

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Contents

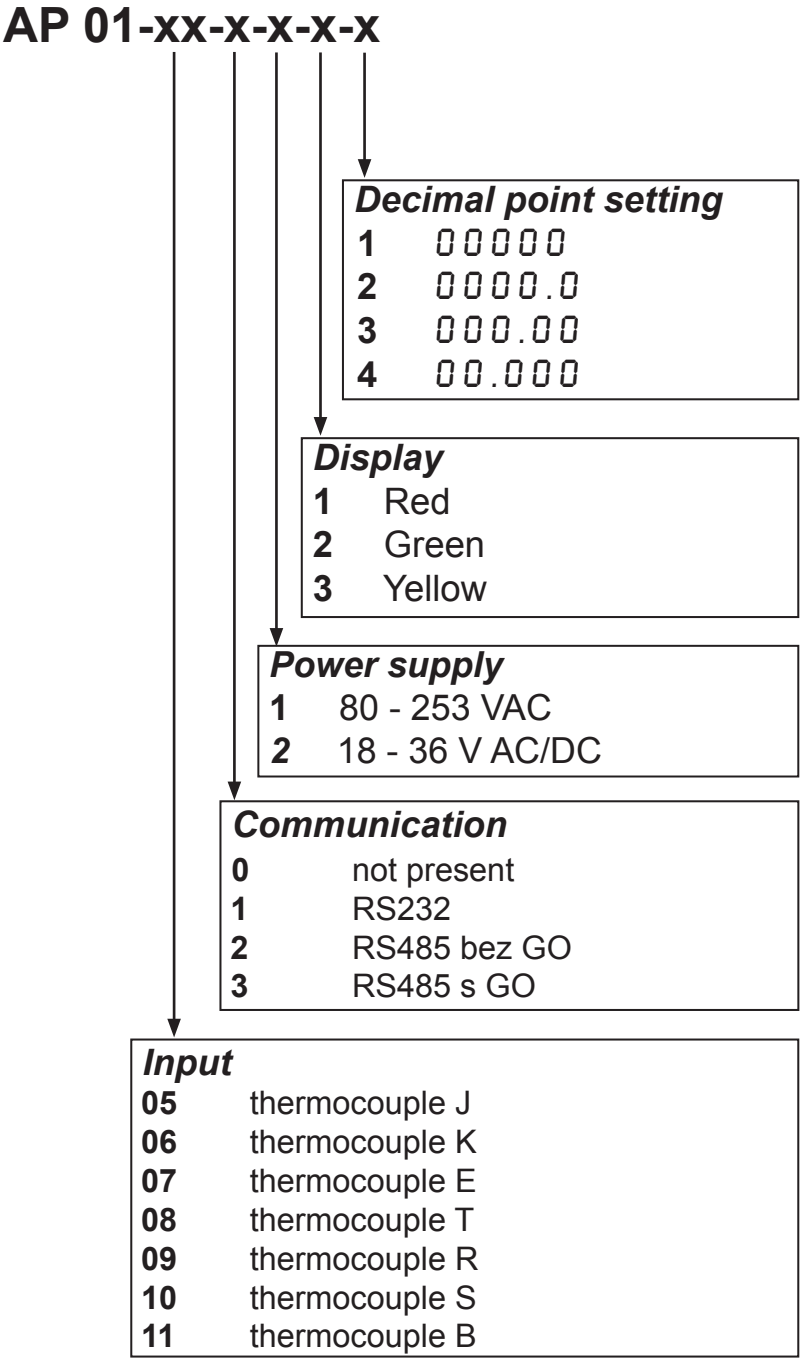
1 Introduction

Panelmeter AP 01 is 5 digit programmable instrument for universal use. Panelmeter is controlled with digital signal processor with A/D transducer. Offer of input signals includes thermocouple (J, K, E, T, R, S, B) . Panelmeter can be equipped with communication lines RS232 or RS485 (can be galvanic separated) are in ordering code. Two communication lines RS485 (one can be galvanic separated) or combination of two communication lines RS232 and RS485.

1.1 Ordering code

This technical documentation refers to the following chart of ordering codes. (fig.1)

fig. 1



2 Technical data

Input signals, accuracy					
	Input signal	meas.range	Accuracy of measurement (% of scale)	Norm	Code
thermo-couples	thermocouples J	-200 ~ 1200 °C	± 0,1%	IEC 584	05
	thermocouples K	-200 ~ 1300 °C	± 0,1%	IEC 584	06
	thermocouples E	-200 ~ 950 °C	± 0,1%	IEC 584	07
	thermocouples T	-200 ~ 400 °C	± 0,1%	IEC 584	08
	thermocouples R	-50 ~ 1550 °C	± 0,1%	IEC 584	09
	thermocouples S	-50 ~ 1700 °C	± 0,1%	IEC 584	10
	thermocouples B	-250 ~ 1800 °C s linearizací od 400 °C	± 0,1%	IEC 584	11
	Compensation of comparative ends of thermocouples inside - accuracy 0,5 °C at temperature 20 °C, temperature coefficient 50 ppm/ °C outside - regulable 20 °C, 50 °C, 70 °C or without compensation				

Power supply	
Power supply voltage	80 - 253 VAC, 50 Hz 18 - 36 VDC / 18 - 36 VAC, 50 Hz
Input	max. 12 VA
Display	
Display	-9999 ~ 0 ~ 99999
Height of digits	14 mm
Decimal point	Adjustable with program
Resolution	According to position of decimal point
Communication	
RS485	without galvanic separation or with galvanic separation, two way communication
RS232	without galvanic separation
Mechanical properties	
Type	Panelmeter
Dimensions	96 x 48 x 119 mm
Opening in panel	90,5 x 43,5 (openings in corners ø 3 mm with pitch 89,5 x 42,5 mm)
Weight	400 g

Operating conditions	
Working conditions	0 - 60 °C
Temperature coefficient	25 ppm/°C
Stabilizing time	Within 5 min after activation
Shielding	IP 54 (front panel) IP 20 (terminal board)
Calibration	at 25 °C and 40% relative humidity
Data back-up	electrically (EEPROM)
Connection	
Connector terminal board	
Max. section of conductor	2.5 mm2 for power supply and contact outputs 1 mm2 for other connectors
Safety class	I
Electromagnetic compatibility **ČSN EN 61326**	
Seismic resistibility **ČSN IEC 980: 1993, part 6**	
Electric safety **ČSN EN 61010-1: 2011**	

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3 Panelmeter description

3.1 Front panel

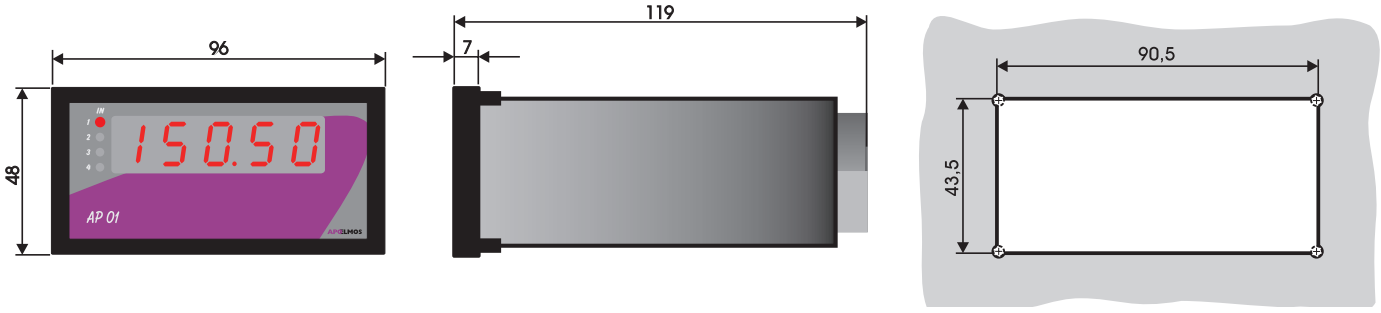
fig. 2

5-digit segment diplay

3.2 Dimensions of panelmeter and assembly opening

Dimensions for power supply 80 - 253 VAC, 50 Hz (fig. 3a)

obr. 3a



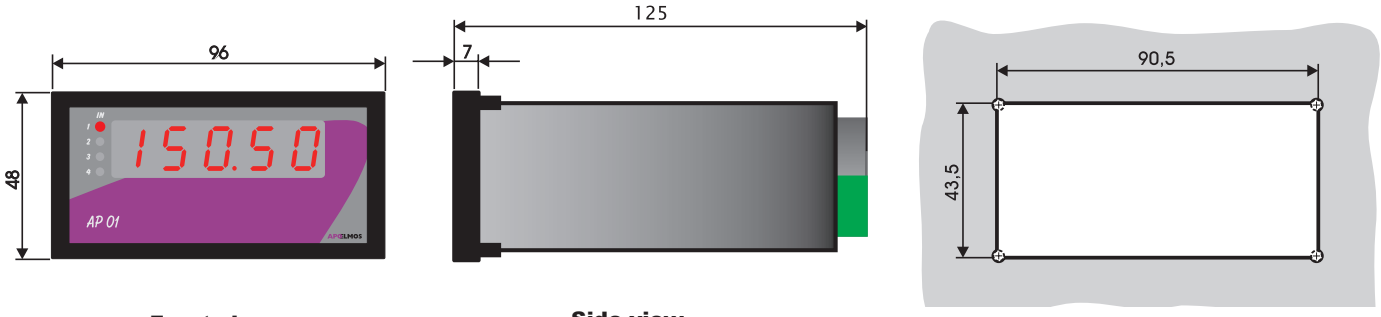
Front view

Side view

Opening in panel
panel thickness 0.5 - 30 mm
holes in corners 3 mm with pitch
89.5 x 42.5 mm

Dimensions for power supply 18 - 36 VDC / 18 - 36 VAC, 50 Hz (fig. 3b)

obr. 3b



Front view

Side view

Opening in panel
panel thickness 0.5 - 30 mm
holes in corners 3 mm with pitch
89.5 x 42.5 mm

4 Connection

4.1. Description of back panel

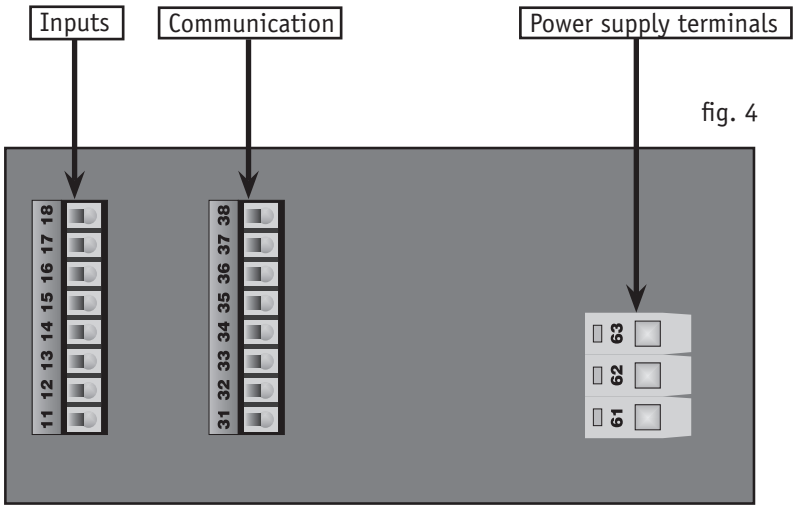


fig. 4

Attention danger of risk
Watch for power voltage

4.2 Instructions for installation into panel and connecting

Fix panelmeter into panel with two clamps (included in delivery).
Connect conductors into screw connectors on the back panel of instrument. Connectors are designed as separately detachable constructions blocks as follows:

connectors 11 to 18 – inputs
connectors 31 to 38 - communication
connectors 61 to 63 – power supply

Pull each block with connectors out from device (locking force has to be surpassed) in backward direction. Then connect conductors to released blocks with connectors and then insert blocks back to device. Max. cross section of conductors on relay connectors and power supply is 2,5 mm2, on other connectors 1 mm2.

Reducing of interference influence

Following rules should be observed with designing of the system:
a) All power supply conductors and power lines has to be led separately from signal lines (e.g. thermocouple, communication). Min. gap between both types of lines should be 30 cm.
b) If signal line crosses power line they should intersect in right angle.
c) Lead the lines out of the potential source of interference.
d) Don‘t install relay and contactors too close to panelmeter.
e) Use twisted and screened conductor for signal line.

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4.3 Connecting of power supply

Caution!

Danger: Don't connect device to power supply until all inputs are connected. Wrong connection of device can cause injury!

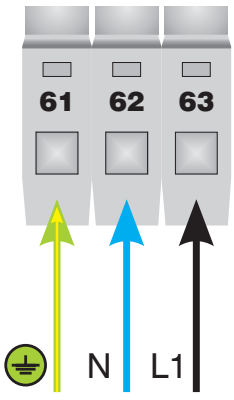
Device connection
During connecting of apparatus main switch or safety circuit breaker has to be:
- part of building installation
- in the close vicinity of equipment
- easy to reach for operating personnel
- marked as equipment disconnecting element

If the equipment is used in different manner than specified by producer, protection provided with equipment can be disturbed.

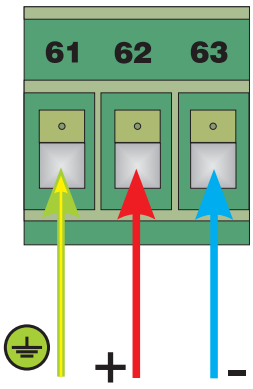
Recommended safety fuse for power supply 230 V je 1 A / 250 VAC
Recommended safety fuse for power supply 24 V je T 3,15 A / 250 V

Connection of power supply conductors in terminal board

Alternating supply voltage 80 - 253 VAC, 50 Hz



Supply voltage 18 - 36 VDC



Supply voltage 18 - 36 VAC

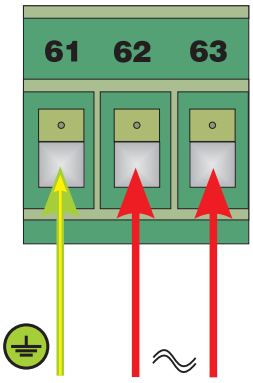


fig. 5

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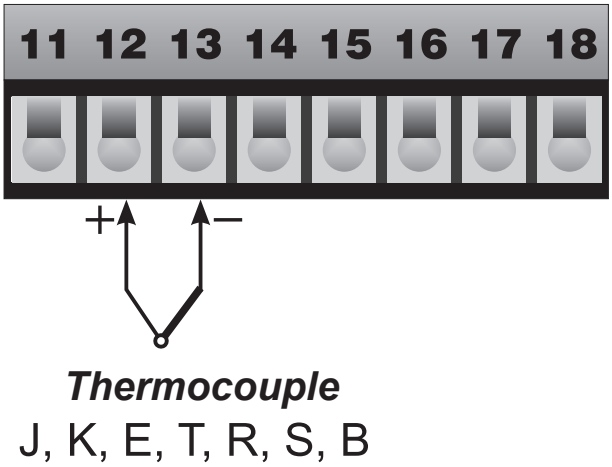
4.2 Connection of thermocouples J, K, E, T, R, S, B

Connect thermocouples to 12, 13 fig.6.

fig. 6



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5 Communication

Panelmeter AP01 can be equipped with communication line of type that is selected with order of panel-meter according to ordering code. Following options of communication lines are available. RS232, RS485 without galvanic separation, RS485 with galvanic separation (further referred to as GS), 2 x RS485 without GS, RS485 with GS + RS485 without GS, RS485 with GS + RS232.

Diagram of communication lines RS232 and RS485 connections

fig. 17

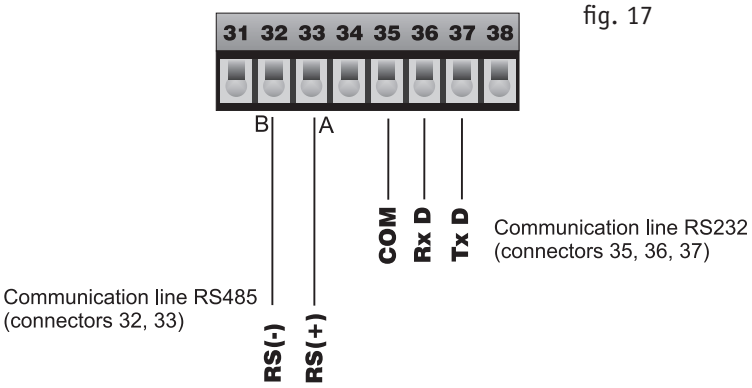
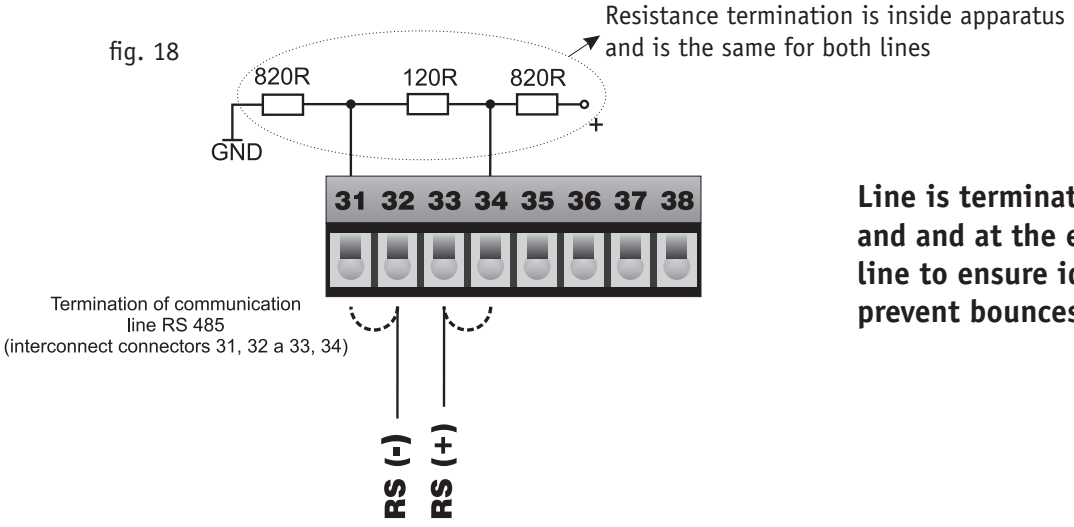


Diagram of communication line RS485 termination

fig. 18

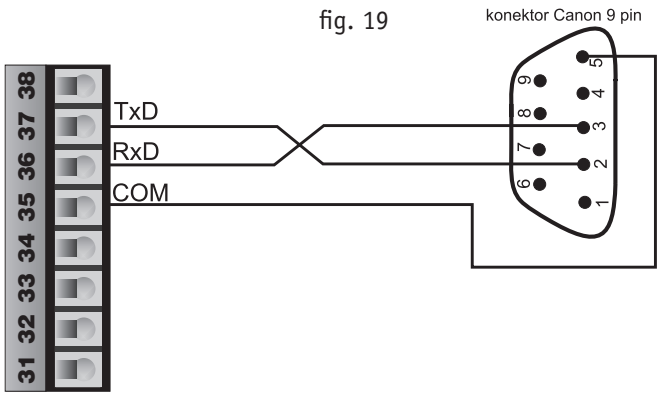


Line is terminated at the beginning and and at the end of communication line to ensure idle conditions and to prevent bounces in line.

Communication line RS485

Diagram of communication line RS232 connection to PC (connector Canon 9 pin)

fig. 19



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EC DECLARATION OF CONFORMITY

We,

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IČO: 60111615

declare under our sole responsibility that the below specified product meets requirements of technical directives and regulations, under specified conditions is save to use and we adopted all measures to guarantee the compliance of all products of below specified type introduced on market with technical documentation and requirements of relating government and European directives.

Product: **Panelmeter AP 01**

Type: **AP 01**

Manufacturer: A.P.O. - ELMOS v.o.s.
Pražská 90
509 01 Nová Paka
The Czech Republic

The product is intended for measurement and displaying of temperature or analogue signals.

Assessment of product compliance was performed within the frame of assessment of production quality system by authorised person (no. AO 201, Electro-technical Testing Institute, Pod lisem 129, Prague 8 – Troja) and monitoring of proper maintaining of the system.

Above mention product is in compliance with the following standards

ČSN EN 61010-1 ed.2:2011 including amendment
ČSN EN 61326-1:2013 including amendment

EN 61010-1:2010 including amendment
EN 61326-1:2013 including amendment

NV 17/2003 Sb. including amendment
NV 616/2006 Sb. including amendment
481/2012 Sb. including amendment

2006/95/EC including amendment
2004/108/EC including amendment
2011/65/EU including amendment

Sample was examined by accredited testing laboratory no. 1103, VOP-026 Šternberk, s.p., division VTÚPV Vyškov, that issued for the product Protocol of safety type test no. 6450-20/2006 dated 28/3/2006, Protocol of EMC test no. 6440-68/2006 dated 2/3/2006 and no. 6440-129/2006 dated 20/3/2006.

The last two digits of the year when the product was certified with mark CE: 06

Place of issue: Nová Paka
Date of issue: 2.5.2006

Name: Ing. Libor Lukeš
Position: Company director

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Pražská 90, 509 01 Nová Paka
DIČ: CZ60111615

Stamp: .....

Signature: .....

7 Quality certificate

Product: **Panelmeter AP 01**

Specification acc. to code: **AP 01** - | | - | | - | | - | | - | |

Serial number: 88-1901-08888

Hereby we confirm that above mentioned product is complete, complies with technical conditions and is duly inspected and tested.

8 Certificate of quality and completness

Manufacturer is responsible for the product to have properties specified by technical standards for stipulated period of time, to be complete and without any defects. Manufacturer is also liable for the defects found by customer within guarantee period and that are timely claimed. The basic condition to be entitled to claim any defect is that the panelmeter is used in the manner specified by technical documentation.
Guarantee period is 36 months since the date of purchase.
Complaint can be claimed on material defects or product malfunction. Guarantee repairs are performed in accordance with internal regulations of A.P.O.-ELMOS in company's workshop. Faulty product has to be properly protected not to be damage during transport.
Guarantee expires if any modifications are performed on product or guarantee tags are broken and if the product was damaged mechanically or by improper use.

Guarantee and after guarantee service is provided exclusively by A.P.O. – ELMOS.

Date of purchase: .....

Signature: .....

.

Stamp

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