

PECA 301

Analyseur de signaux alternatifs *Signal Analyser for Electrical Networks*

Tout type de réseau : monophasé, triphasé équilibré avec ou sans neutre

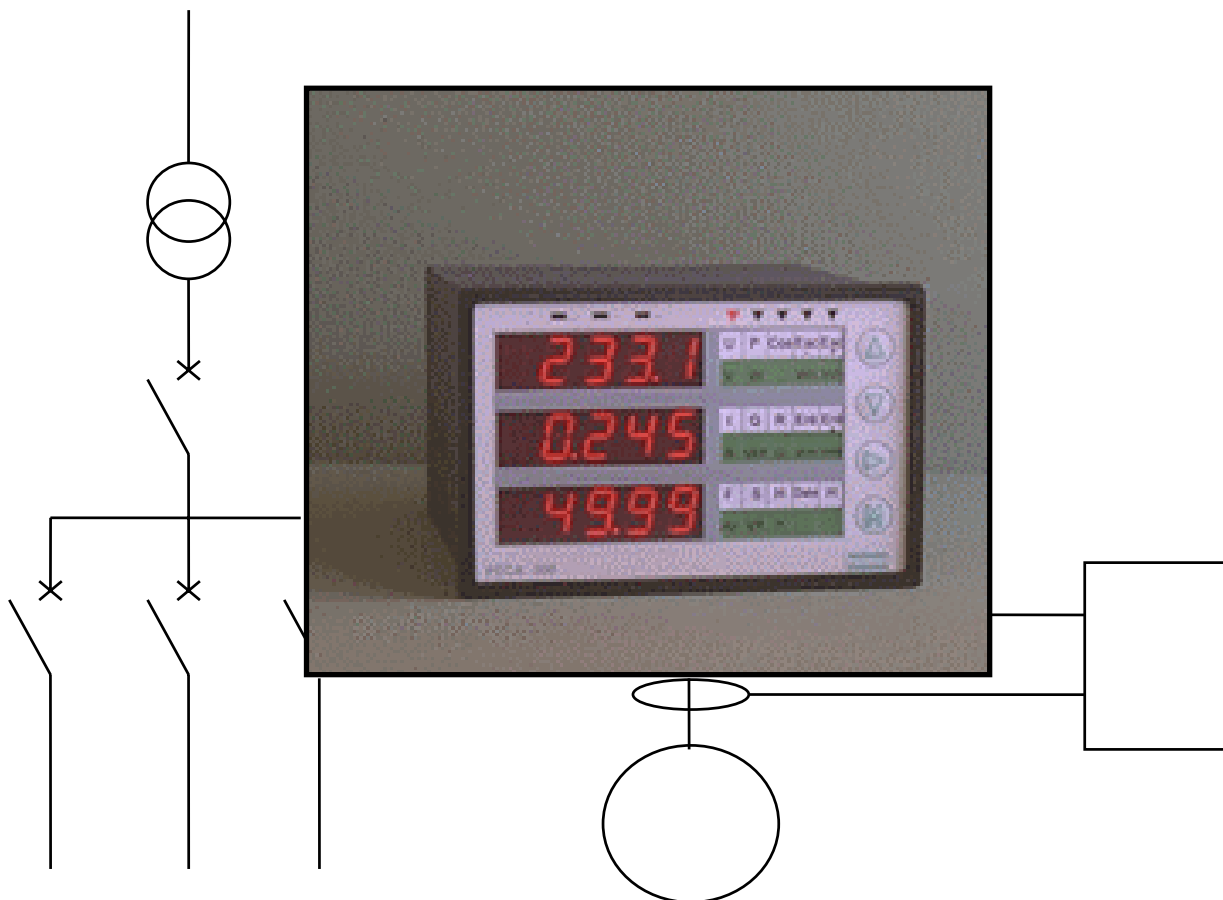
All types of network: single phase, 3-phase balanced, unbalanced, with or without neutral

♦ MESURES EFFICACES VRAIES

TRUE RMS

**Tensions, courants, puissances,
énergies, fréquence, cosinus...**

**Voltage, current, power,
energies, frequency, cosinus...**



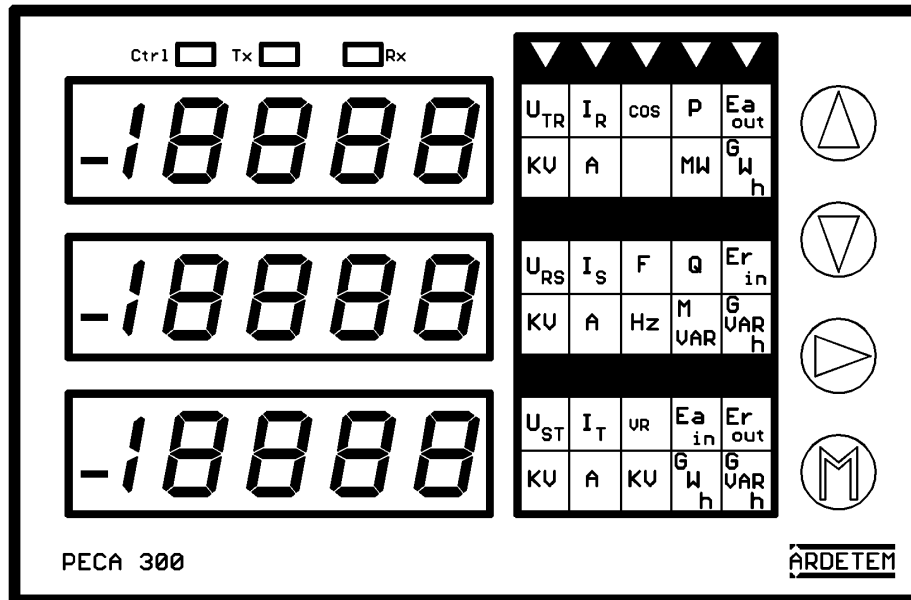
PECA 301

Signal Analyser for Electrical Networks

All types of networks :
Single phase, 3-phase balanced, unbalanced, with or without neutral

- ◆ True RMS
- ◆ Simultaneous display of 3 measured parameters
- ◆ 15 parameters displayed as 5 pages
- ◆ Indication on the front panel of the 15 measured parameters and units
- ◆ Housing 144 x 96 mm
- ◆ Display with 15mm extra bright digit

Voltages, currents, powers, energies, frequencies, $\cos \varphi$, etc. ...



PECA 301

Signal Analyser for Electrical Networks

DESCRIPTION

The ARDETEM PECA 301 analyser is designed to measure, monitor and control all the parameters in an electrical network.

The analyser consists of a panel mounted in a compact housing, which includes the following functions as selected :

- **Digital indication by pages of 3 measured parameters**
- **Relay outputs**
- **Analogue outputs**
- **Pulse outputs**
- **RS485 and RS422 digital output, protocol Modbus-Jbus**
- **Analogue inputs**
- **Logic inputs**
- **Data storage with real timekeeping**
- **Harmonics analysis**

according to chosen options.

The PECA 301 analyser's front panel comprises three 15 mm **extra bright digital indicators**.

A scroll system provides a 5 pages display.

Display of **15 parameters** to choose among a list of 90.

The units are displayed on the front panel for all parameters.

This equipment can be used on **all types of network** :

- Single phase
- 3-phase balanced, with or without neutral
- 3-phase unbalanced with neutral
- 3-phase unbalanced, without neutral, with or without current leak
- With or without current measuring transformer, and voltage measuring transformer.

The device is **fully programmable** by means of the front panel keys.

An easy programming, with complete setting display possibility.

A detailed instruction leaflet is provided.

Identification labels corresponding to the standard variables and their respective units are provided, along with blank labels.

Every data programmed by the operator is stored in a non-volatile memory and thus saved in case of auxiliary power supply failure.

ADVANTAGES

- Compact
- Multi-purpose, adapts to all types of network
- Fully programmable display of 5 pages comprising 3 measured parameters each
- High brightness
- 4-quadrant power measurement
- True RMS measure value with an accuracy of 0,5 (0,2 in option)
- Programmable digital filters
- Security codes
- RS 485/422 serial interface, Modbus-Jbus
- Relay, analogue or pulse outputs as options
- Analogue inputs, logic input in option

■ Universal switch mode power supply

PECA 301**Technical data**

Casing	polycarbonate, black
Format	96 x 144 , DIN 43700 standard
Mounting	panel-mounted - Requires 92 x 138 cut-out
Tightening	by tie rods
Protection	IP 20 for housing - IP 40 frontal protection
Connection	on rear face, 2,5 mm ² capacity (for I) screw in terminals
Indicators	3 x +/- 20 000 count indicators, extra bright digits, 15mm high
Parameters indication	labelled, protected by the front panel
Programming	by means of keys on front panel, detailed instructions provided

Electrical dataAuxiliary power supply

Voltage	version High Voltage : 90 to 270 Vac or 88 to 350 Vdc version Low Voltage : 20 to 53 Vac or 20 to 75 Vdc
Power consumption	18VA max in ac, 8W max in dc

Inputs

Voltage	2 programmable ranges Un = 150 or 500 Vac
Current	In = 1 A or 5 A to be specified on order
Measurable inputs	1.5 In ; 1.2 Un
Overloads	continuous : 750 V, 2 In ; during 10s : 1000 V, 10 In
Power consumption	voltage inputs impedance 1 M ohms, current inputs: < 0,2 VA
Voltage insulation	2 KV , 50 HZ / 1 min
Frequency	50 / 60 Hz, other frequencies on request
Network types	single phase, 3-phase balanced or unbalanced, with or without neutral

Measurements

Parameters number	90
Accuracy	0,5 for U, I & P (0,2 on request) 1 for energies (0,5 on request)
Measurement method	rapid & simultaneous sampling of the 3 voltages & the 3 currents digital computation on 32 bits
Display refreshing	twice per second
Digital filtering	5 programmable integration levels
Energies	stored every 5 min, reading on 8 digits
Cycle time	325ms for a 3-phase unbalanced network 180ms for a 3-phase balanced network

Test and operating conditions

Operating temperatures	0 to +55 °C conform IEC60068-2-1 and IEC60068-2-2
Storage temperatures	-25 to +70 °C conform IEC60068-2-1 and IEC60068-2-2
Operating humidity	40°C and 93% no condensation, 10 days : IEC60068-2-30
Vibrations	1,5mm or 2g from 10 to 150Hz conform IEC60068-2-6
Reference standards	IEC 61000-4-2 : level 3 or 6KV on contact, 8KV in the air IEC 61000-4-3 : level 3 or 10V/m from 80MHz to 1GHz with amplitude modulation from 1KHz to 80% IEC 61000-4-4 : supply level 4 (4KV), inputs/outputs level 4 IEC 61000-4-6 : 10Veff from 150KHz to 80MHz amplitude modulation 1KHz at 80%
Generic standards	immunity: IEC 61000-6-2 rejections : 61000-6-4 Test standard : EN 55011 class A Conform with European Directive 89/336 rev. 92/31 CE marking

PECA 301

Possible options

THE INSTRUMENT CAN INCLUDE SIMULTANEOUSLY

- ◆ 1 output RS 485-422 protocole Modbus-Jbus
- ◆ 1 insulated logic input (or more on request, use to be specified on order) (option)
- ◆ Harmonics analysis (option)
- ◆ Time-dated savings of measures with PC software (option)
- ◆ 2 boards on choice among the following list (option)

LIST OF THE OPTION BOARDS

■ 3 analog inputs

Input signal	:	0/20mA - 4/20mA - 0/10V (specify on order)
Input impedance	:	50 ohm in current - 1 Mohm in voltage
Resolution	:	10 bits
Scale factor	:	programmable

■ 3 setpoint relay outputs

Type of contact	:	2 outputs 2 contacts – 1output 1 contact
Switching capacity	:	5A - 250V Ac
Setting of the setpoints	:	0 to 100% of measure range by programming
Switching hysteresis	:	0 to 200% of setpoint by programming
Time delay	:	0 to 25s by programming

■ 3 pulse outputs

Types of outputs	:	on potential free contact
Count rate	:	0 to 10 pulses per second
Pulse width	:	50 - 100 - 250 ms by programming

■ 3 analog outputs

Galvanic partition	:	3 outputs, insulated at 500V
Output signal	:	programmable : -20/20mA -10/10mA -5/5mA 0/5mA 0/10mA 0/20mA 4/20mA
Scale setting	:	0 to 100% of measure range by programming
Admissible load	:	up to 600 ohm (20 mA)
Board resolution	:	5000 points
Board accuracy	:	<0,1% of full scale on -20/20mA (in relation to the display)
Residual ripple	:	+/-2,5mV on 50 ohm load
Response time	:	30 ms

■ Mixed board : 3 analog outputs / 2 setpoint relays

Same as the board of 3 analog outputs, with 2 relays in addition :

Types of contacts	:	2 outputs 1 contact
Switching capacity	:	2A - 125V Ac
Setting of the setpoints	:	0 to 100% of measure range by programming
Switching hysteresis	:	0 to 200% of the setpoint by programming
Time delay	:	0 to 25s by programming

■ Mixed board : 3 analog outputs / 2 relay outputs

Same as the board of 3 analog outputs, with 2 pulse outputs in addition :

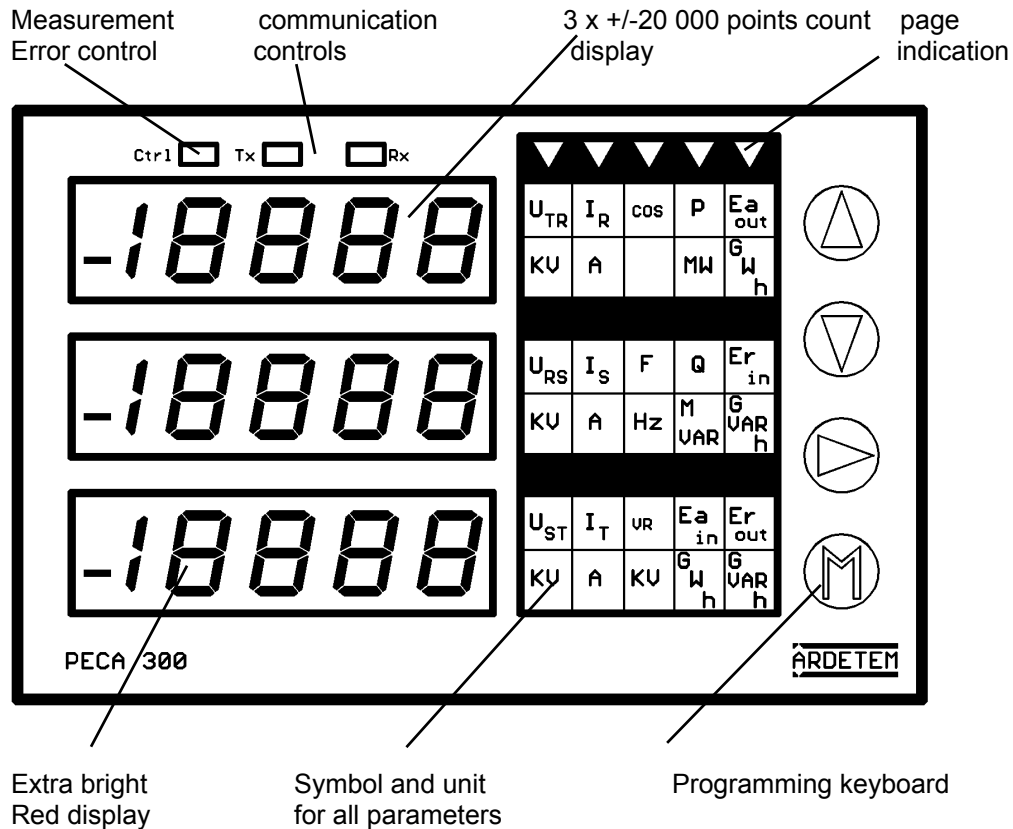
Types of outputs	:	on potential free contact
Count rate	:	0 to 10 pulses per second
Width of the pulses	:	50 - 100 - 250 ms by programming

■ 4 logic inputs

Input signal	:	0 / 24 V others on request
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Input impedance : 3,3k Ω / galvanic partition at 500v between the 4 inputs

PECA 301



Programmable parameters

- ◆ RMS mesh and simple voltage
- ◆ RMS line current
- ◆ Neutral leak current
- ◆ Equivalent total power factor (cos)
- ◆ Frequency
- ◆ Impedance
- ◆ Total active power
- ◆ Total reactive power
- ◆ Total apparent power
- ◆ 10 or 15 min average power
- ◆ Active energies IN and OUT normal tariff or special (please get in touch with us)
- ◆ Reactive energies IN and OUT normal tariff or special (please get in touch with ARDETEM)
- ◆ Power factor per phase (cos)
- ◆ Active and reactive power per phase
- ◆ 3 analogue inputs
- ◆ 10 or 15 min peak average current
- ◆ Harmonics and THD

MEASURABLE PARAMETERS LIST

Nr	MEASURED PARAMETERS	network nr				
		1	2	3	4	5
1	UTR (mesh voltage)	X	X	X	X	X
2	URS (mesh voltage)			X	X	X
3	UST (mesh voltage)			X	X	X
4	Umean = (UTR+URS+UST) / 3			X	X	X
5	VR (single voltage phase R)				X	
6	VS (single voltage phase S)				X	
7	VT (single voltage phase T)				X	
8	IR (line current phase R)	X	X	X	X	X
9	IS (line current phase S)			X	X	X
10	IT (line current phase T)			X	X	X
11	Imean = (IR+IS+IT) / 3			X	X	X
12	Leak current In				X	X
13	IR max (on N minutes*)	X	X	X	X	X
14	IS max (on N minutes*)			X	X	X
15	IT max (on N minutes*)			X	X	X
16	COS total	X	X	X	X	X
17	Frequency	X	X	X	X	X
18	Impedance	X	X	X	X	X
19	Total active power	X	X	X	X	X
20	Total reactive power	X	X	X	X	X
21	Total apparent power	X	X	X	X	X
22	Mean active power (on N minutes*)	X	X	X	X	X
23	Mean reactive power (on N minutes*)	X	X	X	X	X
24	Active energy OUT	X	X	X	X	X
25	Active energy IN	X	X	X	X	X
26	Reactive energy OUT	X	X	X	X	X
27	Reactive energy IN	X	X	X	X	X
28	Active energy OUT, meter 2	X	X	X	X	X
29	Active energy IN, meter 2	X	X	X	X	X
30	Reactive energy OUT, meter 2	X	X	X	X	X
31	Reactive energy IN, meter 2	X	X	X	X	X
32	COS, phase R				X	
33	COS, phase S				X	
34	COS, phase T				X	
35	Active power, phase R				X	
36	Active power, phase S				X	
37	Active power, phase T				X	
38	Reactive power, phase R				X	
39	Reactive power, phase S				X	
40	Reactive power, phase T				X	
41	Analog DC input Nr 1	X	X	X	X	X
42	Analog DC input Nr 2	X	X	X	X	X
43	Analog DC input Nr 3	X	X	X	X	X
44	Running time counter	X	X	X	X	X

* N minutes = average value on the N last minutes (N programmable : 1 up to 60mn)

Optional parameters :

Nr	MEASURED PARAMETERS	network nr				
		1	2	3	4	5
45	Year	X	X	X	X	X
46	Day, Month	X	X	X	X	X
47	Hours, Minutes	X	X	X	X	X
48	Voltage distortion rate	X	X	X	X	X
49	Current distortion rate	X	X	X	X	X
50	Samples dots number	X	X	X	X	X
51	Filling ratio of the saving memory (%)	X	X	X	X	X
52	UTR harmonic 2	X	X	X	X	X
53	UTR harmonic 3	X	X	X	X	X
	...	X	X	X	X	X
60	UTR harmonic 10	X	X	X	X	X
61	UTR harmonic 11	X	X	X	X	X
	...	X	X	X	X	X
70	UTR harmonic 20	X	X	X	X	X
71	non used	X	X	X	X	X
72	IR harmonic 2	X	X	X	X	X
73	IR harmonic 3	X	X	X	X	X
	...	X	X	X	X	X
80	IR harmonic 10	X	X	X	X	X
81	IR harmonic 11	X	X	X	X	X
	...	X	X	X	X	X
90	IR harmonic 20	X	X	X	X	X

- Network 1 = single phase
- Network 2 = 3-phase balanced
- Network 3 = 3-phase unbalanced without neutral & without leak current (IR+IS+IT=0)
- Network 4 = 3-phase unbalanced with neutral
- Network 5 = 3-phase unbalanced without neutral, measurement of the 3 currents IR, IS, IT & In leak.

The impedance and the harmonics are calculated on the R phase.

The harmonic distortion rate is calculated like below :

$$THD = 100 \times \frac{\sqrt{Y_2^2 + Y_3^2 + \dots + Y_{30}^2}}{Y_1}$$

Y_n is the harmonic range of the rank n

$$= \sqrt{H_2^2 + H_3^2 + \dots + H_{30}^2}$$

H_n is the % rate of the n harmonic (H_n display value)

The measured parameters are programmed on the indicators like below : (details page 21)

- Standard parameters :

Parameter Nr → display unit → decimal point position

- Max. current and average power on N minutes :

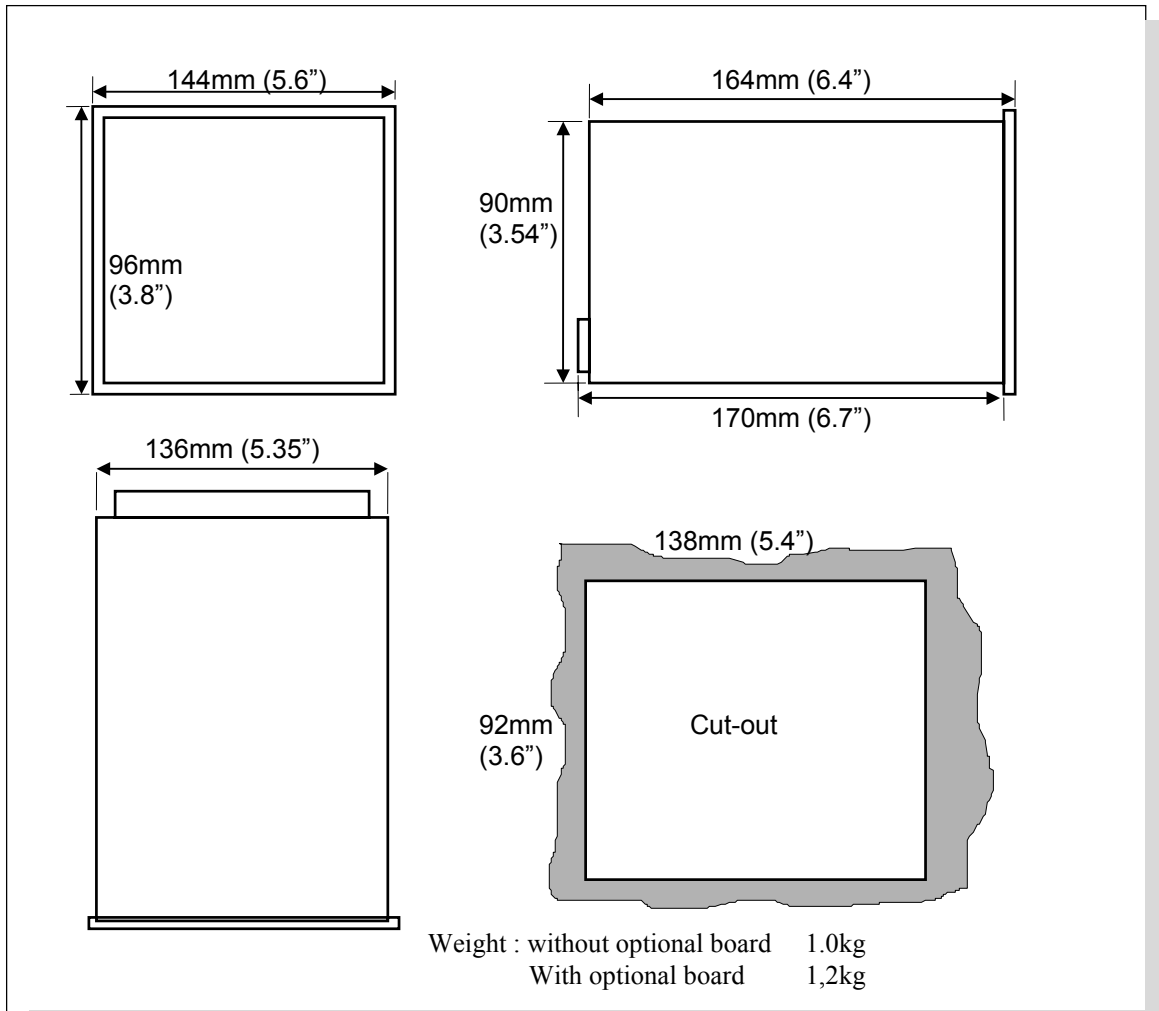
Parameter Nr → N minutes (10, 15mn...) → display unit → decimal point position

- Analog DC inputs:

Parameter N° → display down scale → display full scale → decimal point position

PECA 301

Cut-out and dimensions in mm (in inches)



Subject to change

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