

# **C.A 8230**

# In the field or in the lab: real-time monitoring of electrical installations

SINGLE-PHASE POWER AND QUALITY ANALYSER

C.A 8230

- Intuitive to use
- Large graphic screen, easy to read
- Measures very weak and very strong currents
- Analysis of energy quality
- Analysis of phase shift
- Energy balance
- "Data logging" function
- Display of the waveform of a motor starting current
- Parallel access to all measurement modes
- Excellent value for money

# C.A 8230: SINGLE-PHASE POWER AND QUALITY ANALYSER \_

The **C.A 8230** single-phase power analyser is intended for tradesmen and installers working in collective buildings, for the private and public sectors, and for maintenance departments. Economical and very simple to use, it is especially well suited to the monitoring of electrical installations, in particular those including systems using power electronics.

The number of quantities investigated (VA, VAR, W, PF, etc.) also makes this instrument very attractive for technical and technological training use. And the large graphic screen (320 x 240 pixels) is perfect for demonstrations.

Special care has been taken to make mastering the **C.A 8230** easy; access to the various functions is direct. For even more simplicity, and safety, it recognizes the type of sensor connected automatically.

It is perfectly at home in the field, but its retractable stand allows desktop use as well. Dataviewer software multiplies its capabilities tenfold (configuration and transfer of data to a PC for processing).

# **CHARACTERISTICS**

	<b>C.A 8230</b>		
V Max	600 V RMS		
I Max (according to sensors)	5 mA to 6 A / 300 mA to 120 A = <b>MN 93A</b> 2 A to 240 A = <b>MN 93</b> - 3 A to 1200 A = <b>C 193</b> 10 A to 1400 A = <b>PAC 93</b> - 10 A to 6500 A = <b>Ampflex 193</b>		
Power	1.2 VA to 3,9 MVA - W, VAR, PF / Cos / Tan		
Precision	0.5%		
Harmonics	THD V, A, VA, 50 orders, RMS and %. Expert mode on V and A		
Values	Min, Max, Peak, KF, PST, FC		
Functions	Surveillance of thresholds Phase rotation Viewing of motor starting		
Memory	1.5 Mo		
Pass band	40 -70 Hz		
Sampling frequency	12.8 kHz		
Power supply	Mains. Rechargeable NiMH batteries (40 h between charges with backlighting off - or 8 h).		

# **TO ORDER**

w ... 6

#### P01.1606.31

- 1 C.A 8230 (211 x 208 x 60 mm) instrument with: 1 carrying bag, 6 installed 1.2 V batteries, 1 red banana cord (straight-straight), 1 black banana cord (straight-straight), 2 4 mm probe tips (1 red and 1 black), 2 alligator clips (1 red and 1 black), 1 MN93A clamp, 1 lips power adapter 1 RS 222 optical cord, and Data Viewer processing software

1 line power adapter, 1 RS 232 optical cord, and Data Viewer processing software

### **OTHER ACCESSORIES**

• CLAMP MN93A BK	. P01.1204.34
• CLAMP MN93 BK	. P01.1204.25
• AMPFLEX A193 450 mm BK	. P01.1205.26
• AMPFLEX A193 800 mm BK	. P01.1205.31
• CLAMP PAC93 BK	. P01.1200.79
• CLAMP C193 BK	. P01.1203.23

YOUR DISTRIBUTOR

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DATA VIEWE

### FRANCE

Chauvin Arnoux 190, rue Championnet 75876 PARIS Cedex 18 Tel: +33 1 44 85 44 85 Fax: +33 1 46 27 73 89 info@chauvin-arnoux.fr www.chauvin-arnoux.fr

# UNITED KINGDOM

Chauvin Arnoux Ltd Waldeck House - Waldeck Road MAIDENHEAD SL6 8BR Tel: +44 1628 788 888 Fax: +44 1628 628 099 info@chauvin-arnoux.co.uk www.chauvin-arnoux.co.uk

#### MIDDLE EAST Chauvin Arnoux Middle East P.O. BOX 60-154 1241 2020 JAL EL DIB (Beirut) Tel: +961 1 890 425 Fax: +961 1 890 424 camie@chauvin-arnoux.com

www.chauvin-arnoux.com





# Keeping up with the standards



# C.A 8352

Power Quality Monitor

# Complete electrical network analysis at the tips of your fingers!

- All measurements for complete analysis: powers, harmonics, flicker, symmetry, remote control signals, etc.
- Self-explanatory use
- Touch screen user interface
- Data processing and report publishing software
- Monitoring as per EN 50160 standard
- Network connection

# Presentation

- Internal memory data storage:
   6 months recording capacity
- ✓ Navigable, easy-to-use file structure
- Monitoring and network connection capacity
- Protocol write-ups and test report publishing
- Simultaneous function display
- ✓ Instrument use simplified with touch screen and Windows<sup>™</sup> operating system

# Parameters

# Analysis parameters according to EN 50160 standard in effect

- Network frequency
- Supply voltage
- Fast and slow voltage variations
- Short and long interruptions in supply
- Voltage dips and asymmetries
- Harmonic and interharmonic voltages
- Temporary voltage swells at 50 Hz

### Flicker analysis

• Flicker analysis as per EN 61000-3 and EN 61000-4-15: short-term (Pst) and long-term (Plt) flicker

### Voltage and current analysis

- TRMS and average values
- · Peak value and crest factor

### **Power analysis**

- Generated and consumed active power
- Inductive and capacitive reactive power
- Apparent power, power factor, cos φ
- Calculation of energies on each phase

# Harmonics break-down up to 50th order

- Harmonics: current, voltage, active and reactive power in relation to the fundamental and in absolute
- Phase shift for each harmonic
- THD: overall and order by order
- Direction recognition for each harmonic order
- Interharmonics spectral analysis

### Unbalance and system symmetry analysis

- System symmetry measurement: positive, negative and zero sequence components
- Phase shifting
- Absolute value of voltage and current for the complete spectrum
- Fresnel diagram representation in 3U and 3I
- Overall unbalance of three-phase network

### HV network analysis (high voltage)

- Records "short-circuit" events (faultograph function)
- Remote control signal analysis: definition and verification of the frame



# **INPUT SPECIFICATIONS**

Voltage inputs: Current inputs:

Analogue inputs:

Binary input: With transient option: 4 channels up to 2 kVpp 4 channels, range depends on sensors used: MN 95: 0.2 to 6 A C145 clamp: 2 to 1200 A AmpFLEX A195: 25 to 3000 A Accuracy: < 1% Up to 16 channels, max.1 Hz (optional) For recording environmental conditions, depending on the application 1 external 24 Vbc channel for recording start-up 1 binary output, dry contact, 100 V max (for "transient triggering" status) 1 external 24 Vbc binary input (for "transient triggering" mode start-up)



Making reports

A4 report print out of analyzed data for selected time windows

# MAIN SYSTEM

Main processor: Working memory: Display: User interface: Equipment interface:

Sampling rate:



**GENERAL SPECIFICATIONS** 

256 Mbyte RAM for recording start-up

1 USB port for keyboard, 2 x RS232 ports: data logger (optional), printer, binary I/O

9.6 kHz/channel maximum (38.4 kHz in transient mode, be it 25 µs)

Analysis standards met:

EN 50160 EN 61000-2, -3, -4 EN 61000-4-15 EN 61000-4-30 IEC 61010-1, 500 V, category III pollution degree 2

Electrical safety:

10 Gbytes

touch screen

10" LCD color screen

# **ENVIRONMENTAL CONDITIONS**

Operating temperature: Storage temperature: Relative humidity: Dimensions: Weight: Supply voltage: -10°C to +50°C -20°C to +70°C 10% to 90% (with no condensation) 360 x 300 x 150 mm 4 kg 85 to 135 VAc and 180 to 265 VAc

### COMMUNICATION

Via modem as per publication: CCITT V90 56 kbds Via Ethernet



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To order the instrument configured to your needs, fill	l out the boxes in the order form below	
Power Quality Monitor	code C A 8 3 5 2	
Standard instrument includes harmonic analysis, oscillo standard model supplied with carrying bag, 4 current le 8 voltage leads, 8 crocodile clips, data processing softv USB cable, plus all options marked in the order form.	oscope mode, vector scope: eads (5 A max.), ware CD ROM,	
Optional functions		
Put a 1 to order a function (0 to leave it out)		
Power analyzer. RMS hp	0 or 1	
• Flicker meter, Quality analyzer	0 or 1	
Transient recorder	0 or 1	(
Data logger	0 or 1	
Remote control signals ······	••••••• 0 or 1	
Power 2: symmetry, impedance	0 or 1	
Remote drive via modem	0 or 1	
Current sensors		
• None		···· X X
<ul> <li>Set of 4 x C145 clamps (1000 A - Ø 52 mm</li> </ul>	n)	C X
<ul> <li>Set of 4 x AmpFLEX A195 (3000 A - Ø 140</li> <li>Set of 4 x AmpFLEX A195 (3000 A - Ø 250</li> </ul>	mm / length 450 mm)	···· A 1
<ul> <li>Set of 4 x MN95 clamps (5 A - Ø 20 mm)</li> </ul>	mm / length 800 mm)	M N
User manual languages		· · ·
French (by default) ······		······FR
English		GB
Spanish		F S
opanion		20
2P+E mains supply lead		: _
French, German or Spanish (by default)		F
• English		G
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• SWISS		

# ACCESSORIES

• 4 current leads (maxi 5 A)	P01.2951.84A
• 4 x C145 clamps (1200 Å)	P01.1203.19A
• 8 voltage leads (4 blue, 4 black)	P01.2951.83
• 4 x AmpFLEX A195 800 mm (3000 A)	P01.1205.20
• 4 x AmpFLEX A195 450 mm (3000 A)	P01.1205.19
• 4 x MN95 clamps (5 A)	P01.1204.29
• 1 USB connecting cable	P01.2951.85
Carrying bag	P01.2980.34

# **COMPLEMENTARY ORDERS**

Optional functions to add to those already on your instrument can be ordered. Be sure to include the instrument's serial number in the order form.

O P T Serial number
Power analyzer, RMS hp 0 or 1
Flicker meter, EN 50160 analyzer 0 or 1
Transient recorder 0 or 1
Data logger 0 or 1
Remote control signals 0 or 1
Power 2: symmetry, impedance 0 or 1
Remote drive via modem 0 or 1



TOOR DISTRIBUTOR	

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#### UNITED KINGDOM

Chauvin Arnoux Ltd Waldeck House - Waldeck Road MAIDENHEAD SL6 8BR Tel: +44 1628 788 888 Fax: +44 1628 628 099 info@chauvin-arnoux.co.uk www.chauvin-arnoux.co.uk

#### LEBANON

Chauvin Arnoux Middle East P.O. BOX 60-154 1241 2020 JAL EL DIB (BEIRUT) Tel: +961 1 890 425 Fax: +961 1 890 424 camie@chauvin-arnoux.com www.chauvin-arnoux.com





C.A 8332B C.A 8334B C.A 8335

# The experience of the Qualistar ensuring high performance



# QUALISTAR +

4 voltage inputs & 4 current inputs Inrush mode Unprecedented memory capacity Voltage and current ratios <sup>(NEW)</sup> POWER AND ENERGY QUALITY ANALYSERS

Measure all the necessary voltage, current and power parameters for full diagnosis of an electrical installation.

Capture and record all the parameters, transients, alarms and wave forms simultaneously.

Proven simplicity of use.

# **Power and energy quality analysers**

Designed for inspection and maintenance teams in industrial or administrative buildings, the Qualistar can provide a snapshot of the main electrical network quality characteristics.

Easy to handle and precise, these instruments also offer a large number of calculated values and several processing functions.



# **C.A 8335**

# FUNCTIONS



- Real-time display of wave forms (4 voltages and 4 currents)
- Half-period RMS measurements of voltages and currents
   Intuitive use
- ✓ Automatic recognition of the different types of current sensors
- Integration of all the DC components
- Measurement, calculation and display of harmonics up to the 50<sup>th</sup> order, with their phase information
- Calculation of Total Harmonic Distortion (THD)
- ✓ Capture of transients as short as one sample (1/256<sup>th</sup> of a period)
- Display of phasor diagram
- Measurement of the total VA, W and var power values, as well as the values per phase
- Measurement of total VAh, Wh and varh values, as well as the values per phase

- ✓ Calculation of the K-Factor
- Calculation of the cos φ displacement power factor (DPF) and the power factor (PF)
- Capture of up to 210 transients

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- Flicker calculation
- ✓ Unbalance calculation (current and voltage)
- Monitoring of the electrical network with setting of alarms
- Back-up and recording of screenshots (image and data)
- Recording and export on PC
- Software for data recovery and real-time communication with a PC.

IIII

# **Power and energy quality analysers**

# SETUP

Users enter the instrument's general parameters (date and time, display contrast, etc.) directly.

They then select the type of network to which the Qualistar is connected. The sensors connected are recognized automatically.

Verification is possible on the corresponding screen.



# TRANSIENTS



~			11 /07/00	09:19 mm
<u>1</u> , тғ	RENDMODE			
• Urma	+ Uthd	◇ Ucf		+ Hz
♦ Vrma	♦ Vthd	♦ Vcf	<ul> <li>Vunb</li> </ul>	<ul> <li>PST</li> </ul>
<ul> <li>Arms</li> </ul>	<ul> <li>Athd</li> </ul>	♦ Acf	♦ Aunb	≎KF
• W	VAR	¢VA		
• PF	♥ DPF	∘ Tan		
+ Uh	$01 \rightarrow$	21	o Odd only	
Ah	01 $\rightarrow$	40	<ul> <li>Odd only</li> </ul>	
tar	1/2/	(a)	1/02	
<u>404</u>	±€4 ±	<u> </u>	#34	

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	4	ALARM MO	DDE			
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# **INSTANTLY VIEW THE CHARACTERISTICS OF A NETWORK**

# **OBSERVATION**



# Harmonics mode

Global THD and phase by phase in U, I, V, VA in %, and RMS value, phase shift of harmonics. Only the C.A 8334 & C.A 8335 models have the function for harmonics in VA and the "expert mode"

This mode can be used to analyse the influence of the harmonics on heating of the neutral or on rotating machines.

#### **GLOBAL THD** $\vee \vee$

# DIAGNOSIS

# **\** Power/Energy mode

This mode displays all the values concerning power and energy. The "start" and "stop" keys can be used to activate and deactivate totalizing of the energies.

# Measurements of: W, var, VA Wh, varh, VAh

PF. DPF or cos o AND tan o

# POWER MEASUREMENT

Ŵ	5	0.01 Hz 1	9/11/09 17:42	
<b>1</b> 9	/11/09 17:12:	64 🖱	19/11/09 17:4	2:08
	1	(2)	3	
kW Wh	+10.25 0000238	+6.44 0000149	+6.41 0000146	3L
kvar Varh	+ -0.03 E0000000 +0000002	+ -0.02 E0000001 +0000000	ế +0.04 ế0000001 ÷0000000	L2 L3 X
kVA VAh	10.25 0000238	6.44 0000149	6.41 0000146	Ý

# **INTEGRATION OF POWER / ENERGY OVER A PERIOD OF TIME**



Practical advantages

Accessible on the front panel of the Qualistar®, screenshots can be produced simply by pressing a key. The Help function is available at every stage when you use the Qualistar<sup>®</sup>.

3/05/08 11:32

3/05/08 11:32



If you have any hesitations, the **Help** key clearly ex

to	the
SCI	reen
dis	splay

plains	the functions applicable
N	10/07/08 08:19 🛲 🎟
16	Inductive effect
÷	Capacitive effect
w	Active power
Wh	Active energy (load side)
VAP	Reactive power
VAP	<ul> <li>Reactive energies (load side)</li> </ul>
VA	Apparent power
VAN	Apparent energy (load side)

#### **Screenshot** FOI

When this key is pressed, the instrument takes a screenshot. The screen displayed

W

/05/08 11:31

3/05/08 11:31

3/05/08 11:31

/05/08 11:3

is then saved automatically with time/ date-stamping. Deletion

To avoid overloading the memory, the user can select the type of file

to delete and only keep what is useful.

5=0	01/08/08	09.35	
ERASE MEMORY			
o Trend recordings			
Transients			
Inrush current captur	e		
♦ △ Alarms			
<ul> <li>Snapshots</li> </ul>			
og <b>=S</b> Set-up			
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11 /07/00 10:52m CIII 50.01 Hz 3.7 x 🔿 47.3 x Ø 380 V 10 A 3U 3V 3A L1 L2 L3 -10 -380 5.0ms V1= +334 I1= -0

THD PHASE BY PHASE

RMS THD CF I IIII

# Power and energy quality analysers



# MONITORING

All the monitoring operations are applied to all the characteristics **simultaneously!** 

# ▲ Alarms mode

The alarms are defined when setting up the instrument. Users directly define all the thresholds to be monitored when measuring. Every time there is an alarm threshold overrun, the instrument time/date-stamps the event and records its duration, as well as its Min and Max values.

### Recording mode (Min / Max only on C.A 8335)

When a recording is made, all the parameters required are saved with graphic display of all the parameters selected. In addition, a bargraph at the top of the window indicates the total recording time. The recording period and storage rate are both programmable.





# Transient mode

Transient mode can be used to capture events on the voltage and current, triggered according to thresholds. They are displayed over 4 periods of the event captured at a rate of 256 points/ period, with the possibility of zooming in or out.



# **C.A 8335**

# INRUSH



The Inrush current is the maximum input current drawn by an electrical device when it is powered up. This measurement helps to size the electrical installation correctly.

# Envelope mode



# **RMS** values



# Wave form



# SOFTWAREAR

Measurements made with the *Qualistar* can be processed with 2 software products;

Power Analyzer Transfer for basic processing, and DataView for more comprehensive processing.

# Power Analyzer Transfer

- Configuration of the instrument: setup, recording, alarms
- Processing of recorded data and alarms
- Analysis of the data according to the EN50160 standard
- Transfer of screenshots and transients
- Export of the data into Excel spreadsheet
- Export of the data in graphic form in Windows™

# DataView How of the easy-to-use DataView so

The easy-to-use **Data***View* software automatically recognizes the instrument connected to the PC and opens the corresponding menu.

### Users have direct access to:

CHAUVIN

- $\checkmark$  the data recorded in the instrument
- $\checkmark$  its configuration
- ✓ the various real-time measurements
- $\checkmark$  printing of reports
- $\checkmark$  database management

These instruments are connected to the PC via a USB link or RS232 interface. **DataView** is compatible with other Chauvin Arnoux<sup>®</sup> products.

Minimum Operating System requirements:

- ✓ Windows<sup>®</sup> 2000
- ✓ Windows<sup>®</sup> XP
- ✓ Windows<sup>®</sup> Vista
- ✓ Windows<sup>®</sup> 7



Power Analuzer Transfe

Logiciel d'e PC data ---



# **ACCESSORIES**

In its standard configuration, the **Qualistar** is supplied in a carrying bag with its measurement leads and crocodile clips, its mains power supply, a PC connection cable and processing software.

Users can then choose the current clamps as required.

New with the C.A 8335! Colour-coded rings can be fitted at each end of the measurement leads, making it easier to identify your connections.



# **Technical specifications**

# C.A 8332B - C.A 8334B - C.A 8335

			Qualistar+	
MEASUREMENTS	C.A 8332B	C.A 8334B	C.A 8335	
Voltage (TRMS AC+DC) Phase-Phase	30 6 V to	7 41 960 V	40 / 41	
Phase Neutral	6 V to	900 V	10 V to 1,000 V	
Voltage ratio	8 V 10	400 V	up to 500 kV	
Current (TRMS AC+DC)		100 mA to 6.500 A		
MN clamps	MN93: 2 to 240 AA	c ; MN93A: 0.005 AAC to 5 AAC	/ 0.1 AAC to 120 AAC	
C193 clamp		3 A to 1,200 AAC		
AmpFLEX or MA clamps		30 A to 6,500 AAC		
PAC93 clamp	10	A to 1,000 AAC / 10 A to 1,400	Adc	
E3N clamp			50 mA to 10 AAC/DC	
			100 mA to 100 AAC/DC	
Current ratio			10 mA to 50 kA	
Frequency		40 Hz to 69 Hz		
Power values		W, VA, var, PF, DPF, $\cos \varphi$ , tan $\varphi$	p	
Energy values		Wh, varh, VAh		
Harmonics		yes		
THD		yes, orders 0 to 50, phase		
Expert mode	-	У	es	
Transients	-	50	210	
Flicker		yes		
Inrush mode	-	yes, on 4 periods	yes, > 1 minute	
		yes		
recording with/wax recording	21 minutos	0 42 minutos	yes 1 month	
of a colorition of normatics with accuration every 10 min	21 minutes	42 minutes	r month	
Alarms	/ 000 of 10 d	> 57 days	10 000 of 40 different types	
Recognition of current sensors	8 9			
Peak		Ves	J	
Vectorial representation	automatic			
Display	Colour ¼ VGA I CD screen 320 x 240 diagonal 148 mm			
Capture of screens and curves	8	12	50	
Electrical safety	IEC 6	51010   1,000 V <u>CAT III / 600 V C</u>	AT IV	
Languages	6 25+			
Communication interface	Optical RS232 / USB			
Power supply	9.6 V NiMH rechargeable battery or external mains charger			
Dimensions		240 x 180 x 55 mm		
Weight	2.1	kg	1.9 kg	

#### STATE AT DELIVERY

C.A 8332B and C.A 8334B: delivered with 1 carrying bag No. 22, an optical RS232 lead, a mains power cable, 4 x 3 m voltage leads with 4 mm banana connectors, 4 crocodile clips, 1 safety plug, 1 operating manual, PC software for data recovery. Plus the set of current sensors chosen.
 C.A 8335: delivered with 1 carrying bag No. 22, 1 USB lead, 1 power supply charger, 1 mains power cable, 5 x 3 m voltage leads with Ø 4 mm banana connectors, 5 crocodile clips, 1 x 12-colour identification set for leads and inputs, 1 protective film for screen, 1 safety plug, 1 multilingual operating manual, PC software for data recovery.

#### **REFERENCES FOR ORDERING**

#### ACCESSORIES

C.A 8335 alone P011605	77
C.A 8332B-F MN93A clamp P011605	22
С.А 8334B-F MN93A clamp P011605	52
C.A 8332B-F Amp <i>FLEX</i> ™ 450 mm P011605	23
C.A 8334B-F Amp <i>FLEX</i> <sup>™</sup> 450 mm P011605	53
C.A 8332B-INT MN93A clamp P011605	25
С.А 8334B-INT MN93A clamp P011605	55
C.A 8332B-INT Amp <i>FLEX</i> ™ 450 mm P011605	26
C.A 8334B-INT Amp <i>FLEX</i> ™ 450 mm P011605	56
Other models: please contact us.	

MN93 clamp	. P01	120425B
MN93A clamp	. P01	120434B
C193 clamp	. P01	120323B
PAC93 clamp	. P01	120079B
AMP450 clamp	. P01	120526B
AMP800 clamp	. P01	120531B
Mini-AmpFLEX™ MA193, 200 mm	. P01	120580
E3N clamp*	. P01	120043A
E3N adapter*	. P01	120081
E3N mains power pack*	. P01	120047

P01296024
P01102059
P01102060
P01298055
P01298056
P01295190A
P01295291
P01101959
P01102057
P01102095
8332B



#### FRANCE

**Chauvin Arnoux** 190, rue Championnet 75876 PARIS Cedex 18 Tel: +33 1 44 85 44 38 Fax: +33 1 46 27 95 59 export@chauvin-arnoux.fr

### UNITED KINGDOM

Chauvin Arnoux Ltd Unit 1 Nelson Ct, Flagship Sq, Shaw Cross Business Pk Dewsbury, West Yorkshire - WF12 7TH Tel: +44 1924 460 494 Fax: +44 1924 455 328 info@chauvin-arnoux.co.uk www.chauvin-arnoux.com

#### MIDDLE EAST

Chauvin Arnoux Middle East P.O. BOX 60-154 1241 2020 JAL EL DIB - LEBANON Tel: +961 1 890 425 Fax: +961 1 890 424 camie@chauvin-arnoux.com www.chauvin-arnoux.com

#### For assistance and ordering

# TRMS three- and single phase digital wattmeters



# For measurements on-site or in a laboratory, a new concept: the digital power meter!

- DC or AC TRMS networks: balanced single-phase (PX 110) or three-phase (PX 120)
- Voltage, current, active/reactive/apparent powers and power factor measurements
- High degree of sensitivity
- Simple and quick implementation with direct access keys
- Numerous automatic functions: current range switching, HOLD, filtering, starting current, etc.
- Excellent readability: 3 quantities displayed simultaneously with a digit height of 14 mm
- Digital transmissions protected by infrared communication interface
- Mains power supply (optional)



# PX 120 and PX 110: TRMS three- and single phase digital wattmeters

### More than a wattmeter, a power meter!

Given their wide measuring range and their sensitivity, the PX 120 and PX 110 are intended for both general teaching and vocational training; examples of which are installers and company maintenance departments. To be more precise, their ability to measure RMS values in AC + DC (or TRMS) enables them to carry out measurements in the 4 quadrants on signals which are disturbed and polluted by harmonics. For these applications the PX 120 and 110 go well beyond the functions generally available on traditional wattmeters. That is why we should be talking about a new breed of instrument: the power meter!

The only difference between the two models is that the PX 120 measures powers using the three-phase three balanced wire system, whereas the PX 110 is reserved for single-phase networks.

### Easy implementation

Although they offer elaborate functions, the PX 120 and PX 110 are very simple to implement. Each of the five (PX 110) or six (PX 120) keys corresponds to a single clearly identifiable function. The latter is then accessible via a single press of the key. Finally, the automatic change of range means that the user avoids having to carry out any adjustments. The instrument can be powered by batteries or the mains power supply.

### User comfort and sturdiness

Their casing reinforced with an elastomer mould gives these instruments an excellent handholding capability and a sturdiness which is second to none.

In the event of it being used on a table, a stand allows the instrument to be propped up at an angle of 30°, thus making it easier to read the results. This stand is retracted into its housing on the back of the casing when measurements are carried out on site.

### Starting current

There are loads, such as engines, some heating resistors or lighting systems which, when started up, cause a considerable rush of current. Although they last only a short time, these currents can trigger the safety devices or even damage an installation. To counter this, the PX 120 and PX 110 are provided with the INRUSH function, which consists

in measuring the maximum value of the samples over a halfperiod (with this value being maintained until a new and higher value is measured).

T

Tottering contacts are a thing of the past, the connection is now performed merely by a magnetised optical head which is simply placed on the front panel of the instrument.

Owing to their stand, the PX 120 and PX 110 are as much at ease on a table as in your hand.

and processing software package.

Multilingual data acquisition



PX 120



### Smoothing function

The SMOOTH function is very useful from the moment the measurement in question is an unstable one. It filters the measurements with a time constant of approximately 3 seconds. Display stability then goes from 5 counts to 2 counts.

### **Exceptional readability**

In addition to a particularly large digit size (14 mm), the readout unit of the PX 120 and PX 110 has a display capacity of 9,999 counts (4 digits) on three lines. The user thus simultaneously displays three values. Two different tables then suffice to display all the quantities measured by the instruments.

This digital display is supplemented by different symbols which, at any moment, indicate the operating mode used, the units of each quantity or the state of the battery.

# Protected digital link and software

The PX 120 and 110 have an infrared digital link, thus making it easier to put the connection into place. Moreover, this transmission mode guarantees the user improved safety; besides, the PX 120 and 110 comply with the IEC 61010-1 standard (Category III - 600 V - Pollution level 2).

A processing software package then enables different quantities to be displayed on the screen of a PC, screen print-outs to be obtained, and even measurement files to be transferred to a spreadsheet and stored.

kVAR		spreadsneet and stored.
KVA NRIUSH N	Display kept visible	
	Smoothing mode	SMOOTH Units
	Communication mode	► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ►
	Balanced three-phase ——	
	Battery rundown	PF Power factor
		With the 73 x 54.3 mm LCD display, the user knows what the situation is at a glance. The battery rundown indicator light warns him when the period of autonomy is down to one hour.
	_	Accessories and information required for ordering
1		Accessories included Basically, each wattmeter is delivered with 2 voltage cables (1 red, 1 black), two 20 A current cables, 2 test probes (1 red, 1 black), 6 batteries, a verification certificate and an operating manual.
a		Accessories available as optional extras
94 94 94		HX0011 Wattmeter switch
14 14 14		HX0012 Multiratio AC transformer (10, 15 and 30 A)
14		HY0013 Data acquisition and processing software package*

Accessories available as optional extras					
HX0011	Wattmeter switch				
HX0012	Multiratio AC transformer (10, 15 and 30 A)				
HX0013	Data acquisition and processing software package*				
	for PX 120 and PX 110 wattmeter				
HX0021	Mains power supply				
* Includes the softwa	are package on CD and the RS 232 optical lead.				
To order					
PX0120	DC/AC three-phase three balanced wire digital wattmeter				
PX0110	DC/AC single-phase digital wattmeter				



metrix

# PX 120 and PX 110: TRMS three- and single phase digital wattmeters

TECHNICAL CHARACTERISTICS	PX 120	PX 110
Network type	single-phase and three-phase 3 balanced wire (T3FE)	Single-phase
Number of counts	3 lines of 4 digits (14 mm)	3 lines of 4 digits (14 mm)
Bandwidth	DC to 1 kHz	DC to 1 kHz
Active power		
Range	10 W to 1 kW – 1 kW to 6 kW	10 W to 1 kW – 1 kW to 6 kW
Resolution	0.1 W – 1 W	0.1 W – 1 W
Basic AC / DC accuracy	1% R $\pm$ 2 digits / 2% R $\pm$ 3 digits	1% R $\pm$ 2 digits / 2% R $\pm$ 3 digits
Apparent/reactive power		
Range	10* to 1 k* – 1k* to 6 k*	10* to 1 k* – 1k* to 6 k*
Resolution / Basic accuracy	0.1* - 1* / 2% R ± 2 digits	0.1* - 1* / 2% R ± 2 digits
Power factor		
Range	1.00	1.00
Resolution	0.01 / 3% R ± 2 digits	0.01 / 3% R ± 2 digits
Voltage		
Range	0.5 to 600 V RMS	0.5 to 600 V RMS
Resolution	100 mV	100 mV
Basic AC / DC accuracy	0.5% R $\pm$ 2 digits / 1% R $\pm$ 3 digits	0.5% R ± 2 digits / 1% R ± 3 digits
Input impedance	1 MΩ	1 MΩ
Current		
Range	10 mA to 2 A - 2 A to 10 A RMS	10 mA to 2 A - 2 A to 10 A RMS
Resolution	1 mA – 10 mA	1 mA – 10 mA
Basic AC / DC accuracy	0.5% R $\pm$ 2 digits / 1% R $\pm$ 3 digits	0.5% R $\pm$ 2 digits / 1% R $\pm$ 3 digits
Starting current		
Range	5 A – 65 A (peak)	5 A – 65 A (peak)
Resolution / Accuracy	100 mA / 10% R ± 2 digits	100 mA / 10% R ± 2 digits

\*Apparent power = VA - reactive power = VAR - In three-phase, the measurement is only exact for sinusoidal signals.

GENERAL CHARACTERISTICS	PX 120	PX 110
Interfaces and software	yes	yes
Operating temperature	0 to 50°C	0 to 50°C
Storage temperature	-40 to 70°C	-40 to 70°C
Power supply	6 batteries of 1.5 V (LR6)	6 batteries of 1.5 V (LR6)
Autonomy	40 hours	40 hours
Dimensions (depth x length x height)	60 x 108 x 211 mm	60 x 108 x 211 mm
Weight	835 g	835 g
IEC 61010 safety standard	600 V, Cat. III, pollution level 2	600 V, Cat. III, pollution level 2
Guarantee	1 year	1 year

Characteristics subject to modifications according to technological developments.



FRANCE 190, rue Championnet 75876 PARIS Cedex 18 Tel: +33 1 44 85 44 86 Fax: +33 1 46 27 95 59 e-mail: export@chauvin-arnoux.fr www.chauvin-arnoux.fr UNITED KINGDOM /Chauvin Arnoux Ltd Waldeck House -Waldeck Road MAIDENHEAD SL6 8BR Tel: 01628 788 888 Fax: 01628 628 099 e-mail: info@chauvin-arnoux.co.uk www.chauvin-arnoux.co.uk For assistance and ordering

### C.A 8220



### IEC1010/EN61010 CAT III-600V

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# NEW !

POWER ANALYSER AND MOTOR DIAGNOSTIC TOOLS

Firmly geared towards electrotechnics and the verification of rotating machinery, the C.A 8220 is intended for companies' testing and maintenance teams.

Equipped with a segmented liquid crystal display, compact and shock-resistant, its ergonomic manmachine interface makes it simple and pleasant to use because it is intuitive.

Like the C.A 8230, the C.A 8220 can be used to obtain a snapshot of the main characteristics of a single-phase or balanced three-phase grid.

It also measures all the characteristics needed to check rotating machinery.

It allows accurate measurements from a few millamperes to several kiloamperes, as required, by means of a wide range of sensors.

Rotation speed: predictive maintenance requires regular verification of the rotation speed of rotating machinery. The C.A 8220, an all-in-one instrument, fulfils this need simply and efficiently.

Temperature: the motors and rotating machinery currently used are equipped with temperature probes which are easily accessible on a terminal block. This makes it possible to measure the motor's internal temperature directly by simply connecting the C.A 8220 to this terminal block.

The C.A 8220 is supplied with the PAT (Power Analyser Transfer) software for processing the measurements on a PC (display, analysis, etc).

This software is available free of charge for download from our internet site (www.chauvin-arnoux.com/SUNSUPPORT/support).

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MEASUREMENTS	F09 CLAMP N	IX 2040 CLAMP	C.A 8220	C.A 8230	C.A 8332B	C.A 8334B	C.A 8352	C.A 8340/42
VOLTAGE AC								
DC								
CURRENT AC								
DC			•					•
FREQUENCY								
POWER W	•		•					•
VA								
var	•		•			•	•	•
PF								
DPF/cos $\phi$			•				•	•
tan $\phi$								
<b>ENERGY</b> Wh			•				•	•
varh								
VAh			•	•		•	•	•
HARMONICS								
THD			•	•		•	•	•
FLICKER								
Pst						•		•
Plt				Soft	Soft	Soft		
Sliding Plt								•
UNBALANCE								Three /
INRUSH	Single		Single	Single				Single
RECORDING			Software					
ALARMS						•	•	•
TRANSIENTS								
TEMPERATURE			•					
RESISTANCE								
CONTINUITY			•					
PHASE ROTATION Manu /Au	o M		М	М	A	A	А	А
MIN/MAX		•	•	•	•		•	•
PEAK								
General specifications								
Display	4 000 cts	3 000 cts 1	LCD 73 segments backlit	Colour LCD 1/4 VGA	Colour LCD 1/4 VGA	Colour LCD 1/4 VGA	Colour LCD 10 inch Touch screen	Colour LCD Touch screen
Electrical savety	CAT III	CAT IV	CAT III	CAT III	CAT IV	CAT IV	CAT III	CAT III
	600 V	600 V	600 V	600 V	600 V	600 V	500 V	600 V
Associated software		SX DCOM	P.A.T. Dataview®	Dataview <sup>®</sup>	Dataview <sup>®</sup> QualistarView	Dataview <sup>®</sup> QualistarView	P.Q.M.	<b>Dranview</b> <sup>®</sup>
Communication		Series port	Series port USB	Series port USB	Series port USB	Series port USB	modem, Series port Ethernet	Ethernet, USB Series port via adapter
Dimensions (mm)	193 x 70 x 37	270 x 90 x 50	<mark>211 x 108</mark> x 60	<mark>211 x 108</mark> x 60	<mark>240 x 180 x 55</mark>	<mark>240 x 180 x 5</mark> 5	3 <mark>60 x 300 x 15</mark> 0	<mark>300 x 64 x 20</mark> 3
Weight	260 g	550 g	840 g	880 g	2.1 kg	2.1 kg	4 kg	1.9 kg

# F09 fully automatic AC+DC TRMS pocket multimeter clamp

Single-phase and balanced three-phase power. Voltage, current 400 A-AC/DC. Multi-purpose format.

### State of delivery:

Carrying case, set of 2 leads with test probes, one 9V battery, 1 crocodile clip.

## **C.A 8220** "motor maintenance" power analyser

Half-period voltage calculation (EN 50160). Power analyser Transfer software (P.A.T.) to process the measurements on PC. Motor temperature measurement.

### State of delivery:

6 fitted AA batteries, 1 black banana lead (straight-straight),
2 x 4 mm test probes, 2 crocodile clips (1 red, 1 black),
1 RS232/USB optical lead.

# C.A 8332B CAT IV/600V

Instant display of network analysis.

### State of delivery:

QualistarView software, DB9F optical series lead, 4 banana/banana voltage leads – length 3 m, 4 crocodile clips, 1 mains power lead.



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# C.A 8340 Electrical grid analyser

Colour touch screen 61000-4-30 Class A



1 charger mains adapter,

4 insulated male banana/banana voltage leads,

- 4 insulated crocodile clips, 1 shoulder bag,
- 128 MB memory card, 1 operating manual.

# C.A 8352

# electrical grid quality analyser

Intuitive use. Working memory expanded to 10 GB on internal hard disk.

### State of delivery:

1 carrying bag, 4 current leads, 8 voltage leads, 8 crocodile clips, PC processing software.

A wide range of clamps are available as accessories (delivered as standard with the instruments or optional). The models must be specified when ordering (Ampflex, MN, PAC and C clamps).

FRANCE Chauvin Arnoux 190, rue Championnet 75876 PARIS Cedex 18 Tel: +33 1 44 85 44 85 Fax: +33 1 46 27 73 89 info@chauvin-arnoux.fr www.chauvin-arnoux.fr UNITED KINGDOM Chauvin Arnoux Ltd Waldeck House - Waldeck Road MAIDENHEAD SL6 8BR Tel: +44 1628 788 888 Fax: +44 1628 628 099 info@chauvin-arnoux.co.uk www.chauvin-arnoux.co.uk MIDDLE EAST Chauvin Arnoux Middle East P.O. BOX 60-154 1241 2020 JAL EL DIB (Beyrouth) Tel: +961 1 890 425 Fax: +961 1 890 424 camie@chauvin-arnoux.com www.chauvin-arnoux.com



# MX 2040 2,000 A power clamp

Measurements on three-phase systems, Energy metering. IEC 61010 Cat. IV, 600 V

### State of delivery:

3 measurement leads, 3 test probes, 3 crocodile clips, batteries, operating manual.



# POWER ENERGY DISTURBANCE

# C.A 8230 economical power analyser

Single-phase and balanced three-phase power, Direct access to the different functions, Automatic recognition of the type of sensor connected, Recording and capture of events, Inrush.



# Test the quality of your electrical installation from A to Z



# State of delivery:

1 carrying bag, 6 accumulators, 1 red banana lead (straight-straight), 1 black banana lead (straight-straight), 2 x 4 mm test probes (1 red, 1 black), 2 crocodile clips (1 red, 1 black), 1 mains adapter, 1 RS232/USB optical lead and DataViewer® processing software.

# C.A 8334 B CAT IV/600V

Analyser for 3-phase electrical grids and transients (4 MB memory),

### State of delivery:

QualistarView software, DB9F optical series lead, 4 banana/banana voltage leads – length 3 m, 4 crocodile clips, 1 mains power lead.



### C.A 8342 electrical grid analyser with high-frequency option

Advanced power analysis. 1 MHz sampling rate. 61000-4-30 Class A.



State of delivery: 1 charger mains adapter, 4 insulated male banana/banana voltage leads, 4 insulated crocodile clips, 1 shoulder bag, 128 MB memory card, 1 operating manual.

# DISTRIBUTOR



# THE STANDARDS

# EN 50160

Defines the measurements required to qualify the voltage delivered by the electrical grid: rms voltage, outages, voltage dips, swells, flicker, frequency, harmonics (up to the 40th order) and three-phase system unbalance.

# IEC 61000-4-30

Defines the methods and accuracies for the power quality measurements listed in the EN 50160 standard (rms voltage, outage, voltage dips and swells, harmonics).

# IEC 61000-4-7

Defines the method for measuring harmonics and interharmonics

# IEC 61000-4-15

Defines the flicker measurement method including:

- Pst short-term flicker indicator: Quantitative evaluation of the flicker over a 10-minute period.
- Plt long-term flicker indicator: Quantitative evaluation of the flicker over a 2-hour period, using 12 successive short-term flicker (Pst) values.



Causes: Loads such as a

switching power supply, compact fluorescent lamps, etc., connected to a star + neutral installation generate harmonics of order 3 and multiples of 3. **Risks:** Fire, untimely tripping of safety systems, etc. **Measurements:** THD, THD per harmonic order. **Recommended instruments:** C.A 8220, C.A 8230, C.A 8232B/34B, C.A 8340/42, C.A 8352



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# Alarms/Events

**Purpose:** Detecting and providing notification of a specific event and testing the quality of the electricity supplied.

**Risks:** Equipment containing digital electronic components is sensitive to micro-cuts, overvoltage, harmonics, disturbance, etc.

> **Recommended instruments:** C.A 8230, C.A 8332B/34B, C.A 8340/42, C.A 8352



**Cause:** Loads drawing high currents, leading to flickering, frequency variations, etc.

**Risks:** Medical (malaise, fatigue, headache, etc.)

**Recommended instruments:** C.A 8230, C.A 8332B/34B, C.A 8340/42, C.A 8352

# Reactive power (VAR)

Applications: Non-linear current loads (variable speed drive, switching power supply, etc.). Risks: Fire, untimely tripping

of electrical protection devices, fire, over-billing, etc.

Recommended instruments: C.A 8220, C.A 8230, C.A 8232B/34B, C.A 8340/42, C.A 8352

