

# C.A 8331 - C.A 8333 - C.A 8336 - C.A 8435

## Power and Energy quality Analysers



### QUALI STAR+

- 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.

True **InRush**

## The experience of the Qualistar, ensuring high performance

- 5 voltage inputs & 4 current inputs
- 10-minute Inrush mode
- Calculation of distorting power
- IP67: all-terrain model available

# Qualistar+ range

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.



Designed to cover all 600 V CAT IV and 1000 V CAT III applications in compliance with the IEC 61010 standard, the Qualistar+ range is divided up according to the functions provided and the connections available:

- ▶ C.A. 8331 & C.A. 8333: 4 voltage inputs and 3 current inputs,
- ▶ C.A. 8336 & C.A. 8435: 5 voltage inputs and 4 current inputs.

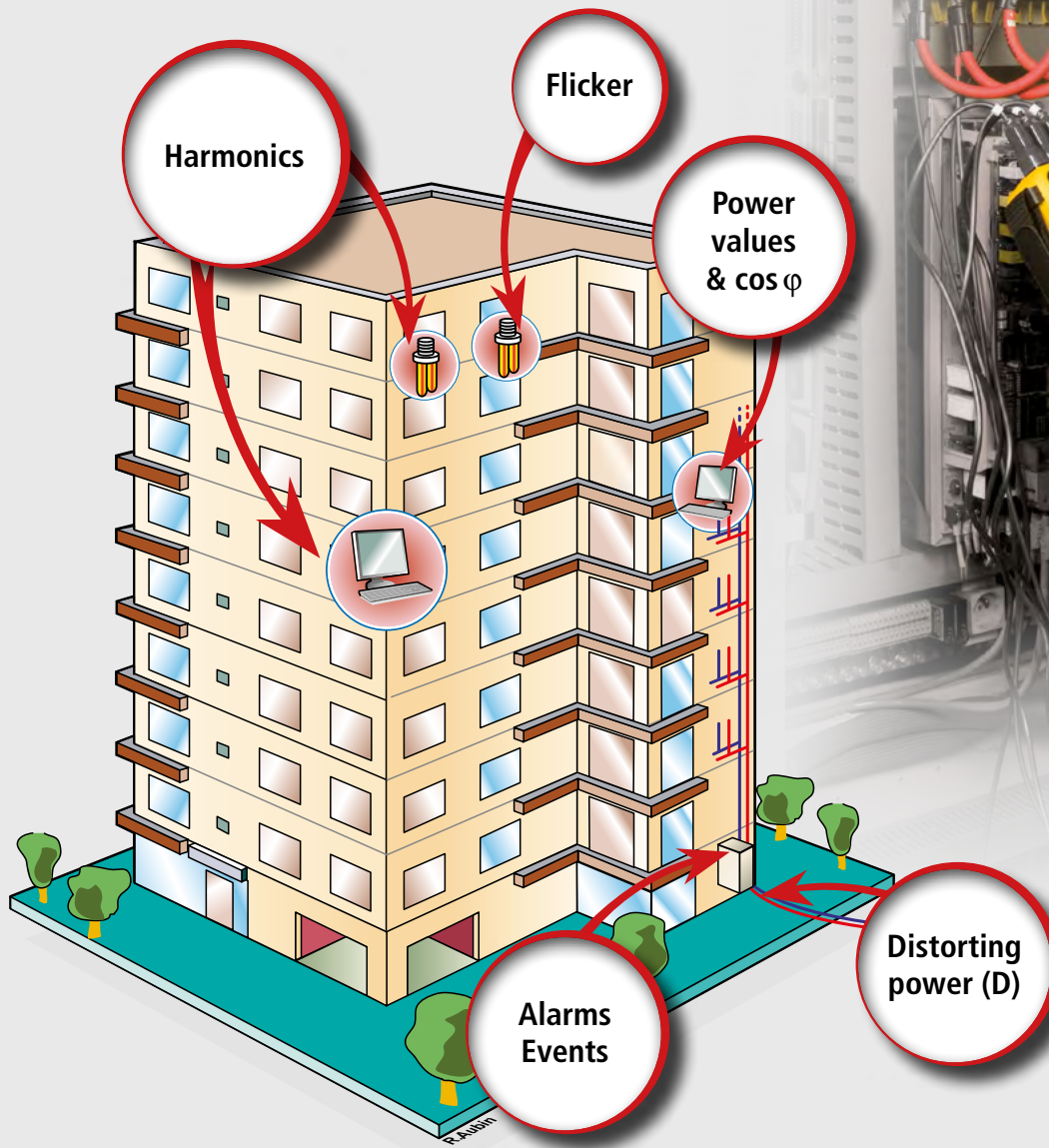
The whole range benefits from a set of inserts and rings for customizing the colour-coding in each country. Equipped with IP67 connections to ensure water-proofing, the C.A. 8435 is also compatible with all the existing Qualistar measuring accessories.





# Power and energy quality analysers

## 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
- ▶ Measurement on any type of installation: three-phase, Aron, etc.
- ▶ Integration of all the DC components
- ▶ Measurement, calculation and display of harmonics up to the 50<sup>th</sup> order,
- ▶ Display of phasor diagram
- ▶ Measurement of P, Q, S and D power values (total and per phase)
- ▶ Energy measurement (total and per phase)
- ▶ Calculation of the K Factor & FHL
- ▶ Calculation of distorting voltages and currents
- ▶ Calculation of the  $\cos \phi$  displacement power factor (DPF) and the power factor (PF)
- ▶ Inrush over up to 10 minutes
- ▶ Capture of hundreds of transients lasting several tens of  $\mu$ s
- ▶ Calculation of Pst & Plt flicker values
- ▶ Unbalance calculation (current and voltage)
- ▶ Monitoring of the electrical network with setting of alarms
- ▶ IEC 61000-4-30 Class B
- ▶ 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

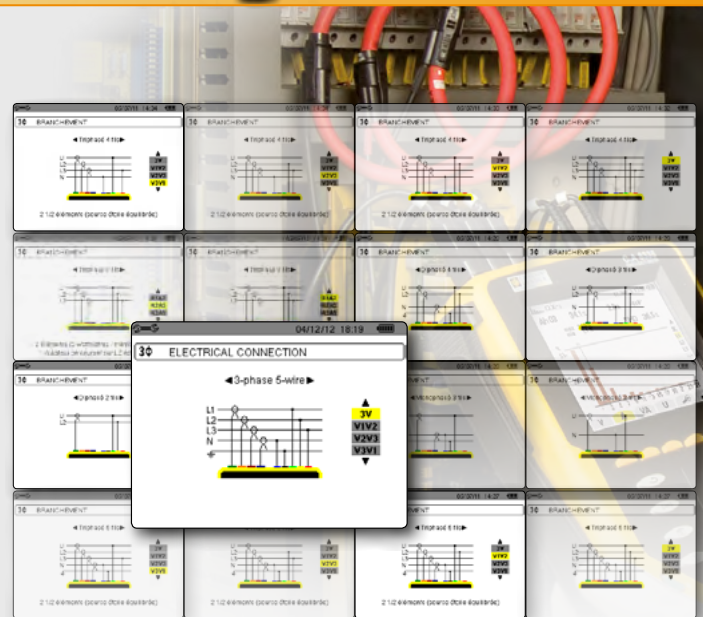
# Qualistar+ range

## Functions

### Connections

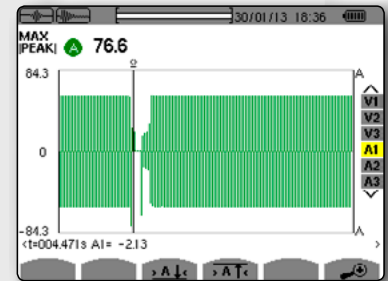
The Qualistar models are ideal for applications on all types of electrical networks, from the simplest to the most complex:

- Single-phase, split-phase and three-phase with or without neutral
- All types of 2, 3, 4 and 5-wire electrical networks
- 2-wattmeters method
- ARON
- 2 ½ elements...

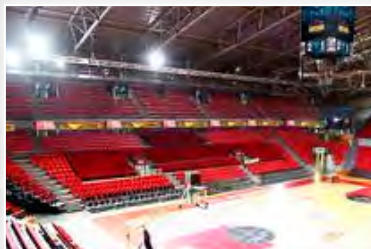


### Longer Inrush... over 10 minutes!

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



The Inrush is measured over a period of 10 minutes. Once you have chosen the acquisition mode (RMS or peak), the Qualistar captures everything.



### Short or long-term flicker

The flicker (as defined by the IEC/EN standard) characterizes voltage variations which cause lighting fluctuations, for example.

According to the applicable standards, the Flicker level is expressed by two parameters:

- **Pst ( short-term flicker)**  
Calculation of the Pst, which is used to assess the flicker level, is based on statistical processing of the voltage signal sampled. It is measured over a period of 10 minutes
- **Plt (long-term flicker)**  
This is a multiple of the Pst. It is measured over a period of 2 hours.



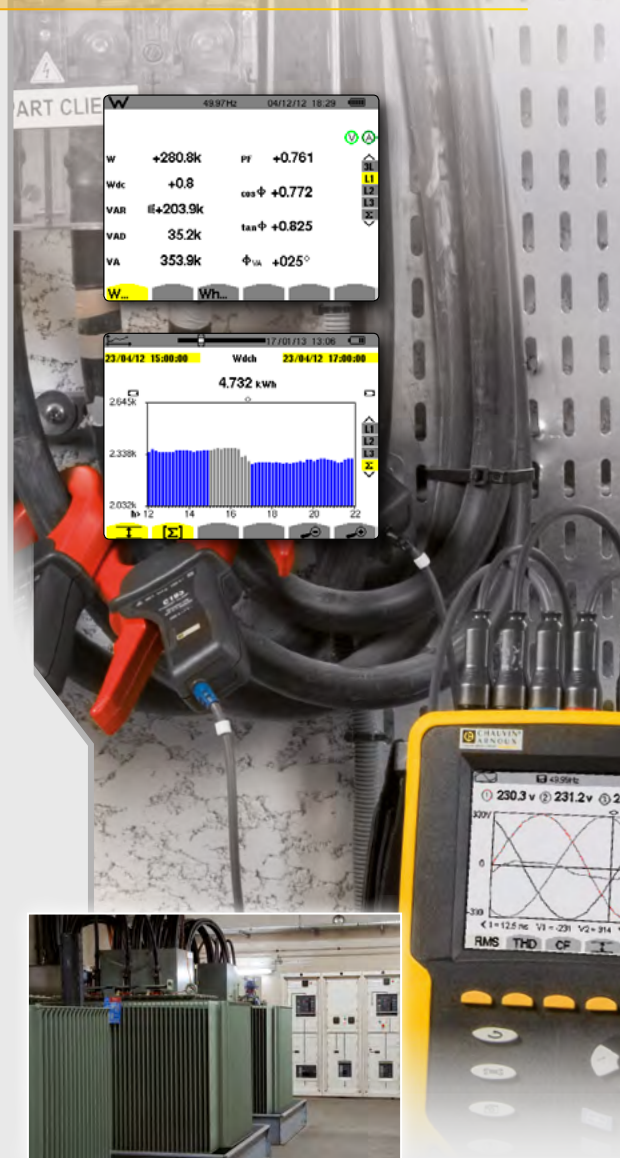
# Power and energy quality analysers

## Energy values, including Tonnes Oil Equivalent

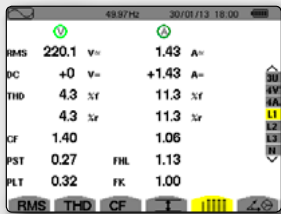
The Qualistar models measure energy. This mode displays all the values relating to power and energy.



- "Start" and "Stop" keys to activate and deactivate summing of the energy values.
- A new feature is the wide variety of units available: kW, Joule, nuclear toe, non-nuclear toe, BTU, etc



## Calculation of K factor for transformers



The harmonic currents flowing in a network lead to increased losses in the windings. This results in heating of the transformer and reduces the life span of the instruments connected.



- compliance with the NF EN 50464-3 standard for calculating transformer derating.
- the FHL and European K factor parameters are recorded and measured simultaneously.

## Harmonics

All the useful parameters are measured: global THD and per phase on U, I, V and VA, phase offset of harmonics. Some models offer a VA harmonics function and an "expert mode".

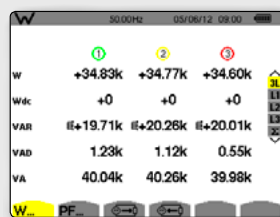
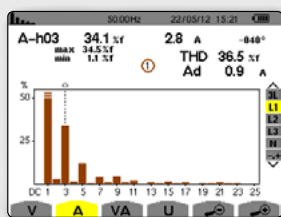


## Distorting power

### New!

Breakdown of the reactive power values, with the concept of non-active power (N), distorting power (D) and reactive power (Q & Q<sub>1</sub>).

- Breakdown of the reactive power to find the distorting power linked to the harmonics (VAD).
- Distorting power for sizing the harmonic filters.
- Reactive power (var) of the fundamental for sizing the battery of the power-correction capacitor.



New: the harmonics measurement function is more comprehensive:

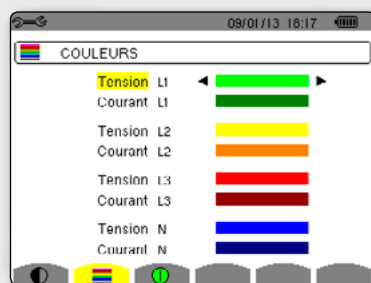
- calculation of the harmonics in %f and %r
- decomposition of the harmonics on the neutral conductor
- calculation of the distorting voltages and currents

# Qualistar+ range

## Configuration

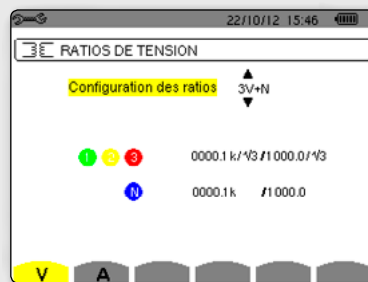
- ▶ Users enter the instrument's general parameters directly (date and time, display contrast, colour, etc.).
- ▶ The menus, help screens and pop-ups are translated into all the languages.
- ▶ They select the type of network to which the Qualistar is connected.
- ▶ They configure the measurement and recording parameters.

## Display

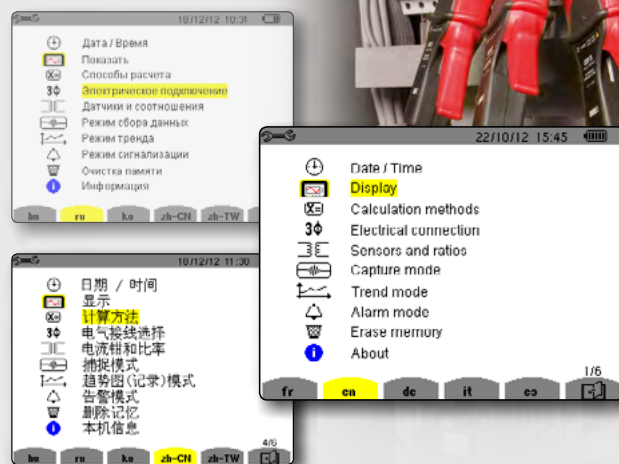


## Ratios and sensors

When they are connected, the current sensors are recognized automatically by the Qualistar. By configuring the ratios, it is possible to obtain **direct readings of the measurements** on the transformer primary.



## Languages

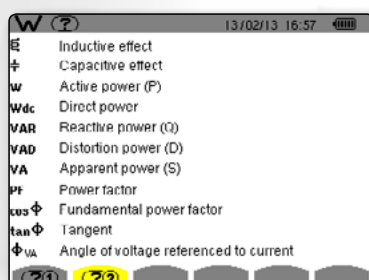


## Practical advantages

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.

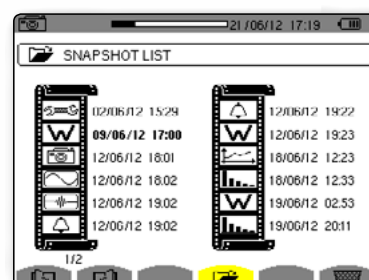
### Help

If you have any hesitations, the **Help** key clearly explains the functions applicable to the screen display.



### Screenshot

When this key is pressed, the instrument takes a screenshot. The screen displayed is then saved automatically with time/date-stamping.





# Power and energy quality analysers

## Display

View the characteristics of a network instantaneously

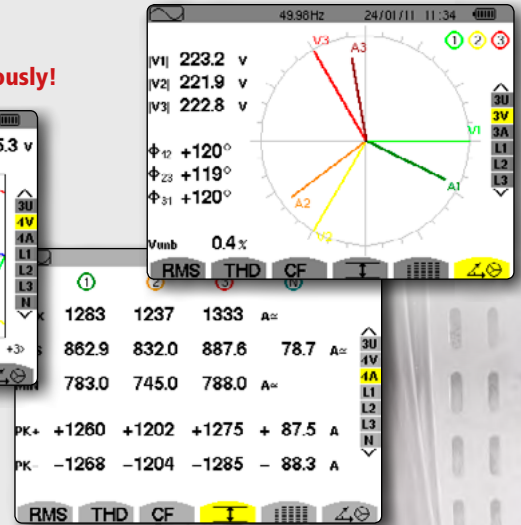
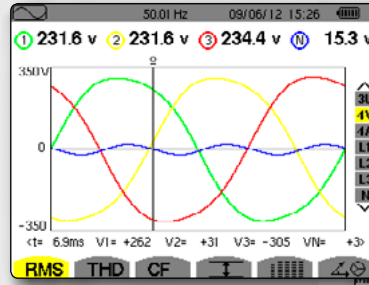
### OBSERVATION



Graphics

The Qualistar models allow you to view all the inputs simultaneously. The measurements are displayed as waveforms; values or Fresnel diagrams.

View all the channels simultaneously!



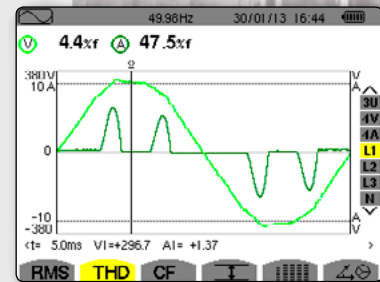
### DIAGNOSTICS



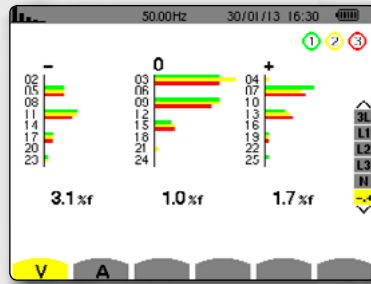
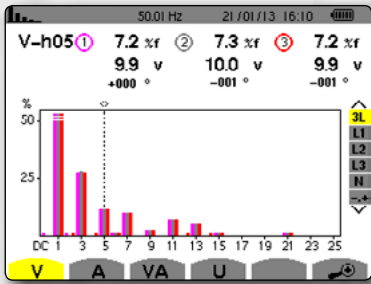
Harmonics mode

Global THD and per phase on U, I, V and VA in % and RMS value, phase offset of harmonics. They offer the expert mode for the Harmonics function. These two instruments can be used to analyse the influence of the harmonics on heating of the neutral or on rotating machines.

THD PHASE BY PHASE



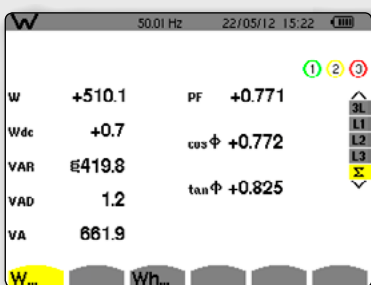
GLOBAL THD



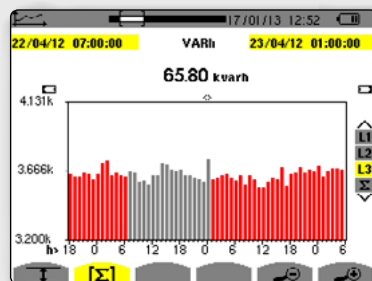
### Power/Energy mode

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.

POWER MEASUREMENT



INTEGRATION OF POWER / ENERGY OVER A PERIOD OF TIME



# Qualistar+ range

## Monitor everything,

### Configuration

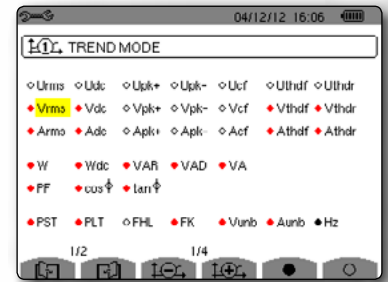
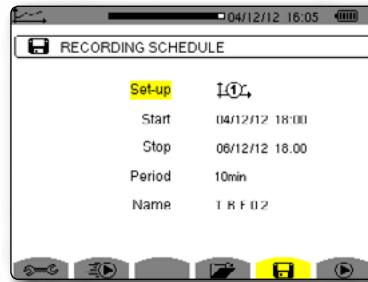


#### Recording mode

- More than 450 recordable values with all the required parameters and graphic display.
- Programmable recording period and storage rate.

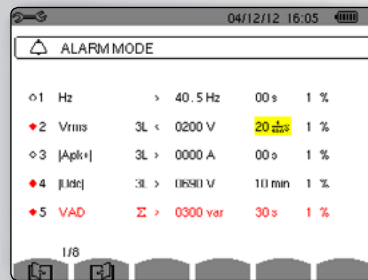
#### New! Quick start-up:

- **Immediate start of recording**
- Automatic indication of Min/Max values
- Auto-completion of measurement campaign names



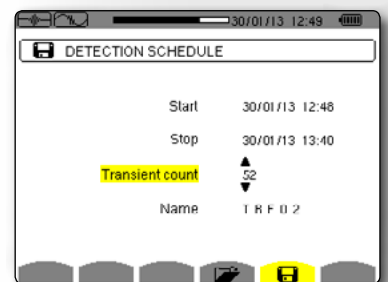
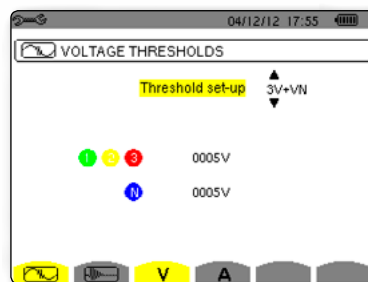
#### Alarms mode

- **Up to 40 alarms can be set simultaneously!**
- Threshold overruns to be monitored can be configured during set-up.
- For each alarm threshold overrun, a time/date-stamped recording of the event is made with the duration and the extreme values.
- Possibility of modifying the end dates for programmed alarms.



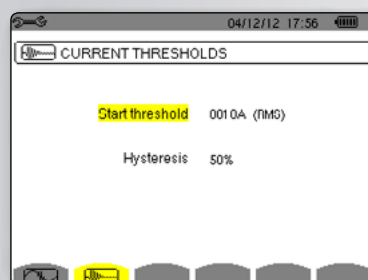
#### Transients mode

- Capture of events on the voltage and current with triggering according to thresholds.
- **Capture of hundreds of transients.**
- Display of events as short as a few tens of  $\mu$ s.



#### Inrush & TrueInrush

- Monitoring of the Inrush current for a load when it is powered up.
- **Records the currents, voltages and frequency.**
- For correct sizing of electrical installations.
- To view source switching faults.





# Power and energy quality analysers

## with more parameters

Acquisition in progress 

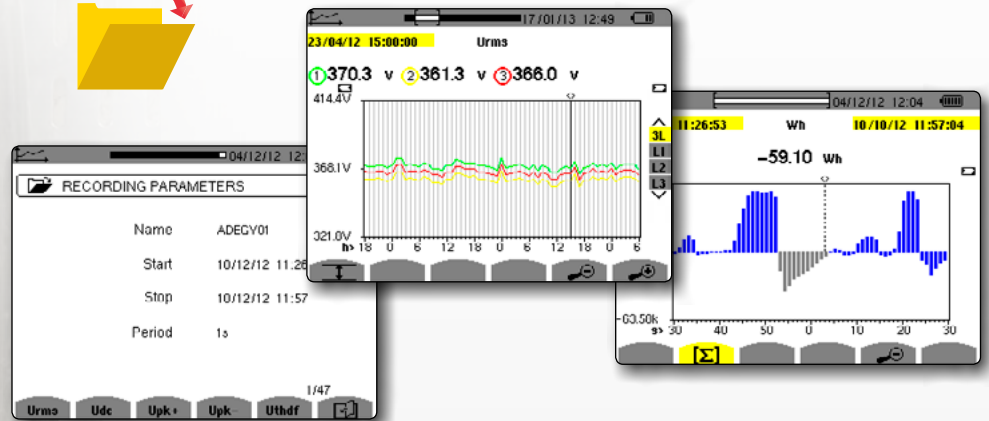
Analysis 



During acquisition:

- ▶ Operation of several modes in parallel,
- ▶ Possibility of viewing the data during a campaign.

Users can view all the parameters, so they can be checked at any time.



DETECTION LIST

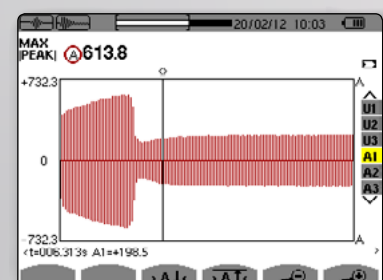
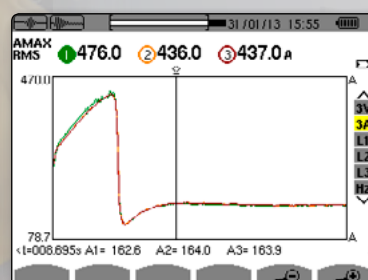
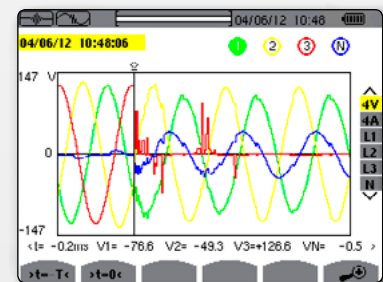
TRY01	20/04/12 15:43	>03/05/12 09:53
TRF02	04/12/12 18:00	>06/12/12 18:00
ADEG	13/01/13 13:26	>13/01/13 14:11

ALARM LIST

04/12/12 16:43	L1 Vrms	231%	2s
16:49	L2 Vrms	0V	2s
18:30	L2 Vrms	0V	43ms
18:43	L1 Arms	1A	1s
18:50	L3 Vrms	218V	2ul 3h
05/04/12 05:49	L2 Vrms	213V	12h5min

TRANSIENT LIST

TRY01	053	20/04/12 15:46:47	.507	V2
	054	20/04/12 15:46:51	1594	V2
	055	20/04/12 15:46:51	.681	V2
	056	20/04/12 15:46:52	.609	V2
	057	20/04/12 15:47:00	1.53	V2
	058	20/04/12 15:47:07	.126	V2
	059	20/04/12 15:47:14	.210	V2
	060	20/04/12 15:47:16	.961	V1



# Special all-terrain C.A 8435

A rugged, waterproof C.A 8435, the special Qualistar+ for all conditions and all seasons!

IP  
67



- Indoor and outdoor use, including in the rain
- 5 voltage inputs, 4 current inputs
- Continuous, simultaneous recording of all the parameters
- Monitoring with alarms
- All installation types



Specific caps have been developed to ensure maximum waterproofing for the C.A 8435 analyser.



Specific accessories for this model: mains lead, sets of voltage leads and AmpFlex® clamps.

The rugged site case is ideal for industrial use in factories, production workshops, etc. It is so rugged that it can even withstand projections of solids or liquids.

## ACCESSORIES

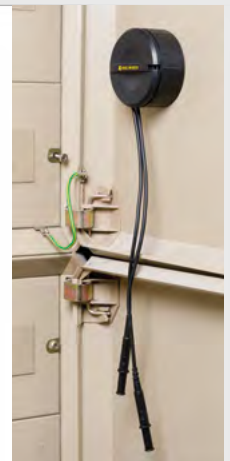
### Essailec plug for all the Qualistar models

A cable with an ESSAILEC plug can be used for testing without disturbances or interruptions in the power supply circuit on meters and the protective relays installed in the secondary circuits of the current or voltage transformers. The main advantage is quick and simple measurement with maximum user safety.



### Reeling Box

This practical magnetized winder equipped with the MultifIX system allows you to adjust the length of your cables. It can be opened so that users can install banana-type leads for voltage measurements or MiniFlex® MA193-250 flexible sensors for current measurements. It also provides a simple means of stowing your cables.



### PA31ER adapter

This enables self-powering of the Qualistar+ via the phase from 100 V to 1,000 V, AC or DC. It is connected directly to the voltage inputs and is:

- IP53
- IEC 61010 CAT III 1,000 V / CAT IV 600 V.





# Accessories and software

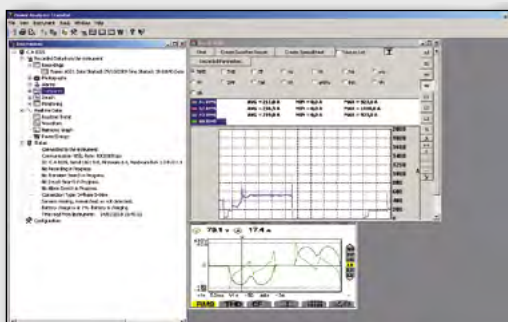
## ACCESSORIES



Model	MN93	MN 93A	MA193-250	MA193-350	PAC93	A196-450 A193-450	A193-800	C193	E3N	J93
Measurement range	500 mA to 200 AAc	0.005 AAc to 100 AAc	100 mA to 10 kAAc	100 mA to 10 kAAc	1 A to 1,000 AAc 1 A to 1,300 AAc	100 mA to 10 kAAc	100 mA to 10 kAAc	1 A to 1,000 AAc	50 mA to 10 AAc/bc 100 mA to 100 AAc/bc	50 A to 3,500 AAc 50 A to 5,000 AAc
Clamping Ø / length	20 mm	20 mm	Ø 70 mm / 250 mm	Ø 100 mm / 350 mm	1 x Ø 39 mm 2 x Ø 25 mm	Ø 140 mm / 450 mm	Ø 250 mm / 800 mm	52 mm	11.8 mm	72 mm
IEC 61010	600 V CAT III / 300 V CAT IV		1,000 V CAT III / 600 V CAT IV		600 V CAT III / 300 V CAT IV	1,000 V CAT III / 600 V CAT IV		600 V CAT IV	600 V CAT III / 300 V CAT IV	600 V CAT III / 1,000 V CAT IV

## SOFTWARE

The measurements made with the Qualistar can be processed using two software products; **Power Analyzer Transfer** delivered as standard and **DataView** available as an option.



## Power Analyzer Transfer

- ▶ Configuration of the instrument: setup, recording, alarms
- ▶ Real-time display
- ▶ Processing of the recorded data and the alarms
- ▶ Transfer of screenshots and transients
- ▶ Data export into Excel spreadsheets
- ▶ Data export in graphic form in Windows™



## DataView®

The simple-to-use **DataView** software automatically recognizes the instrument connected to the PC and opens the corresponding menu. Users have direct access to:

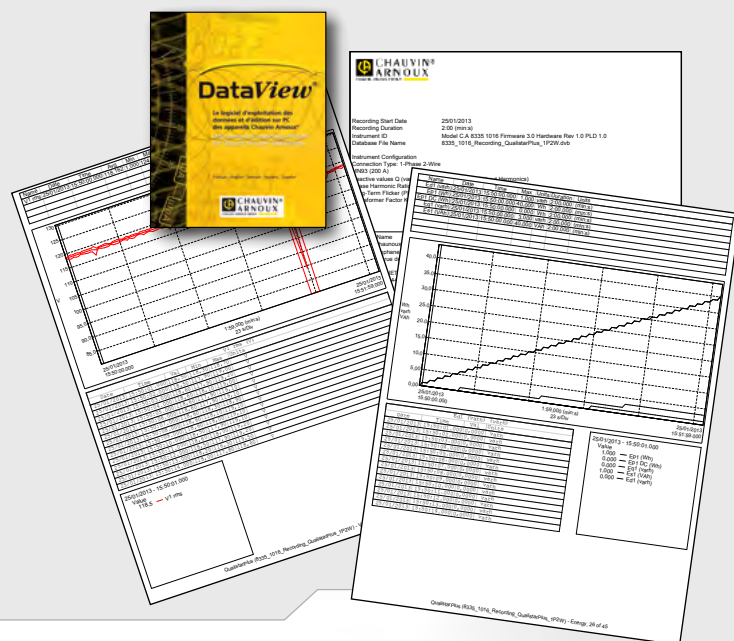
- ▶ database management
- ▶ EN 50160 report management

**DataView** is compatible with other Chauvin Arnoux® products:

Qualistar+ power analysers, C.A 8220 & C.A 8230 power analysers, F400 and F600 multimeter clamps, and other measuring instruments.

Minimum operating system requirements:

Windows® 2000, Windows® XP, Windows® Vista, Windows® 7 and 8.



## EN 50160

The EN 50160 European standard regulates the quality of the voltage distributed by electricity suppliers. To define the quality of the voltage, a measurement campaign must be carried out over a 7-day period with an IEC 61000-4-30 instrument.

The measurements correspond to the different types of disturbances liable to affect the voltage: voltage drops, outages, overvoltages, slow voltage variations, network frequency variations, voltage unbalance, harmonics, rapid voltage variations, flicker.

Once these measurements have been taken, the recorded data are analysed.

The PAT software automatically configures the instrument in compliance with the standard.

The DataView® software can be used to generate the report automatically in compliance with the EN50160 standard.

## Technical specifications

	C.A 8331	C.A 8333	C.A 8336	C.A 8435
<b>Number of channels</b>	3U / 4I		4U / 4I	
<b>Number of inputs</b>	4V / 3I		5V / 4I	
<b>Voltage (TRMS AC+DC)</b>	2 V to 1,000 V up to 500 kV			
<b>Current (TRMS AC+DC)</b>	MN93: 500 mA to 200 A <sub>AC</sub> ; MN93A: 0.005 A <sub>AC</sub> to 100 A <sub>AC</sub>			
	C193 clamp 1 A to 1,000 A <sub>AC</sub>			
	AmpFlex® or MA193 clamps 100 mA to 10,000 A <sub>AC</sub>		30 A to 6,500 A <sub>AC</sub>	
	PAC93 clamp 1 A to 1,300 A <sub>AC/DC</sub>			
	E3N clamp 50 mA to 100 A <sub>AC/DC</sub>			
	Current ratio up to 60 kA 40 Hz to 69 Hz			
<b>Frequency</b>	40 Hz to 69 Hz			
<b>Power values</b>	W, VA, var, VAD, PF, DPF, cos φ, tan φ			
<b>Energy values</b>	Wh, varh, VAh, VADh			
<b>Harmonics</b>	yes			
	THD yes, orders 0 to 50, phase			
	Expert mode -   -   yes			
<b>Transients</b>	-   50   210			
<b>Flicker</b>	Pst -   -   yes Plt -   -   Yes			
<b>Inrush mode</b>	-   yes on 4 periods   yes > 10 minutes			
<b>Unbalance yes</b>	yes			
<b>Recording</b>	Min/Max yes			
	of a selection of parameters at the max. sampling rate 4 hours to 2 weeks   A few days to several weeks   2 weeks to several years			
<b>Alarms</b>	-   4,000 of 10 different types   10,000 of 40 different types			
<b>Peak</b>	yes			
<b>Vectorial representation</b>	automatic			
<b>Display</b>	Colour ¼ VGA TFT screen, 320 x 240, diagonal 148 mm			
<b>Capture of screens and curves</b>	12		50	
<b>Electrical safety</b>	IEC 61010 1,000 V CAT III / 600 V CAT IV			
<b>Protection</b>	IP53 / IK08		IP67	
<b>Languages</b>	more than 27			
<b>Communication interface</b>	USB			
<b>Battery life</b>	up to 13 hours			
<b>Power supply</b>	9.6 V NiMH rechargeable battery or external mains charger			
<b>Dimensions</b>	240 x 180 x 55 mm		270 x 250 x 180 mm	
<b>Weight</b>	1.9 kg		3.7 kg	

### STATE AT DELIVERY FOR THE C.A 8336, C.A 8333 AND C.A 8331

#### Models without sensors

One Qualistar+ analyser delivered with a bag for accessories, 5 x 4 mm banana voltage leads 3 m long, 5 crocodile clips, a set of 12-colour inserts/rings for identifying the leads and inputs, a scratch-proof screen-protection film (mounted), a USB cable, a mains power cable, a mains power pack, a safety datasheet, a multi-language operating manual CD and a PC data retrieval software CD (Power Analyser Transfer).

### STATE AT DELIVERY FOR THE C.A 8335

**C.A 8435 AMP450:** delivered with bag no. 22, USB cable, IP67 mains power cable, 4 AmpFlex® 450 IP67 A196 current sensors, 5 x 3 m black IP67 BB196 banana leads, 5 lockable crocodile clips, 12-colour identification kit for the leads and inputs, scratchproof screen-protection film (mounted), safety datasheet, CD containing the multi-language operating manual and CD PC data retrieval software and CD containing PC data retrieval software (Power Analyzer Transfer).

### References for ordering

C.A 8336 alone .....	P01160591
C.A 8333 alone .....	P01160541
C.A 8331 alone .....	P01160511
C.A 8435 alone .....	P01160585
C.A 8435 AmpFlex® 450 mm .....	P01160587

### Accessories and replacement parts

MN93 clamp .....	P01120425B	Qualistar screen film .....	P01102059
MN93A clamp .....	P01120434B	Set of id. rings/inserts .....	P01102080
MiniFlex® MA193, 250 mm .....	P01120580	Set of caps (C.A 8435) .....	P01102117
MiniFlex® MA193, 350 mm .....	P01120567	Set of 5 x 3 m IP67 (BB196) banana leads .....	P01295479
PAC93 clamp .....	P01120079B	Carrying bag no. 21 .....	P01298055
AmpFlex® A193 450 mm clamp .....	P01120526B	Carrying bag no. 22 .....	P01298056
AmpFlex® A193 800 mm clamp .....	P01120531B	USB-A USB-B lead .....	P01295293
AmpFlex® A196 450 mm IP67 clamp .....	P01120552	5 A box .....	P01101959
C193 clamp .....	P01120323B	Mains power pack (C.A 8331-33-35-36) .....	P01102057
E3N clamp .....	P01120043A	IP67 mains lead (C.A 8435) .....	P01295477
E3N Adapter .....	P01102081	Dataview® Software .....	P01102095
E3N mains power pack .....	P01120047	Lockable crocodile clips (x 5) .....	P01102099
J93 clamp .....	P01120110	Kit containing 5 banana leads, 5 crocodile clips and 1 set of coloured rings .....	P01295483
Battery pack .....	P01296024	Kit containing 4 banana leads, 4 crocodile clips and 1 set of coloured rings .....	P01295476
ESSAILEC casing .....	P01102131		
Reeling Box .....	P01102149		
PA31ER mains adapter .....	P01102150		