

CHOOSE YOUR ELECTRICAL MEASUREMENT LOGGER

**L102**
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							With display
							Without display
Power							
							Power values
							Energy values
Current							
							Clamp format
BNC							Voltage inputs (format)
	Banane						Current inputs (format)
2	1	2	4	4			Number of inputs
See acc.	See acc.	MiniFlex®	MiniFlex®	AmpFlex®			Sensor type
Voltage							
							RMS
							DC
							Number of inputs



STRENGTHS

- Compatible with all electrical networks: single-phase, split-phase, three-phase with or without neutral, etc.
- Implementation without powering down the electrical network
- All the instruments can be powered by the phase
- Data recording on integrated SD card
- Compact and magnetized for mounting in closed cabinets

ADDITIONAL INFO

- The PEL Transfer analysis software is delivered as standard for:
- Configuration of the PEL100s
 - Verification of the connections before recording starts
 - Downloading of the recorded measurements
 - Display of the various measurement results and analyses

ACCESSORIES / REPLACEMENT PARTS

- Bag no. 23 P01298078
- Mains adapter P01102134
- See all the accessories on page 144

CONTENTS

- A PEL 102 or PEL 103 logger delivered with:
 - 4 measurement leads
 - 4 crocodile clips (black)
 - 1 x 2 GB SD card
 - 1 set of markers (for the ends of the leads and current sensors)
 - 1 mains power cable
 - 1 USB cable (Type A / Type B)
 - 1 Multifix mounting system
 - 1 carrying bag
 - 1 safety datasheet
 - PEL Transfer PC software
 - 1 SD USB adapter
 - 1 CD-ROM containing the user manual

PEL 102 - PEL 103

Ref.: P01157152

P01157153

1000 V
CAT III600 V
CAT IVIP
54

SPECIFICATIONS

	PEL 102		PEL 103	
Display	None		With triple digital display	
Type of installation	Single-phase, split-phase, three-phase with or without neutral, etc.			
Number of channels	3U / 4I			
Number of inputs	4U / 3I			
Measurements				
Network frequency	DC, 50 Hz, 60 Hz & 400 Hz			
Voltage (measurement range)	10.00 to 1,000 V _{AC/DC}			
Current	MN93	500 mA to 200 A _{AC}		
	MN93A	5 mA to 100 A _{AC}		
	C193	1 A to 1,000 A _{AC}		
	AmpFlex® A193 & MiniFlex® MA193	200.0 mA to 10.00 kA _{AC}		
	PAC93	1 A to 1,000 A _{AC} 1 A to 1,300 A _{DC}		
	E3N	50 mA to 10 A _{AC/DC} 100 mA to 100 A _{AC/DC}		
	J93	50 A to 3,500 A _{AC} / 50 A to 5,000 A _{DC}		
Calculated Measurements				
Ratios	Up to 650,000 V / up to 25,000 A			
Power	10 W to 10 GW / 10 var to 10 Gvar / 10 VA to 10 GVA			
Energy	Up to 4 EWh / 4 EVAh / 4 Evarh (E = 10 ¹⁸)			
Phase	cos φ, tan Φ, PF			
Harmonics	THD			
Additional functions				
Phase sequence	Yes			
Min / Max	Yes			
Mounting	Magnet, hook			
Recording				
Sampling rate / Acquisition interval / Aggregation	128 samples/period - 1 measurement/s from 1 min to 60 min			
Data storage	SD card, 8 GB (SD-HC card up to 32 GB)			
Communication	USB, Ethernet & BlueTooth®			
Power supply	110 V - 250 V (+10%, -15%) @ 50-60 Hz & 400 Hz			
Safety	IEC 61010 600 V CAT IV 1000 V CAT III			
Mechanical specifications				
Dimensions	256 x 125 x 37 mm without sensor			
Weight	900 g		950 g	
Casing	IP54, ETL			



PEL 105

Ref.: P01157155

1000 V
CAT IVIP
67

ADDITIONAL INFO

- When used with the DataView® software, the measurements made with the PEL105 can be processed directly for measurement report generation.
- Possibility of remote connection via an IRD server

ACCESSORIES / REPLACEMENT PARTS

- A196A current sensor P01120554
- Pole mounting kit P01102146
- See all the accessories on page 144

CONTENTS

- One PEL105 logger delivered with:
- 5 black silicone leads 3 m long, straight banana / straight banana
- 5 black crocodile clips, 1000 V CAT IV
- 1 set of inserts/rings
- 4 AmpFlex® IP67 A196 3 m long
- 1 set of waterproof caps
- 1 SD card
- 1 USB cable
- 1 bag
- 1 safety datasheet
- 1 USB key containing a quick startup guide and a user manual

STRENGTHS

- Suitable for installation on an electricity pole
- All-terrain casing resistant to shocks, UV light and high temperatures
- Self-powered by its voltage inputs up to 1,000 V
- Continuous recording with a 200 ms acquisition interval
- Measurements in compliance with the IEEE 1459 standards

SPECIFICATIONS

PEL 105	
Display	With triple digital display
Type of installation	Single-phase, split-phase, three-phase with or without neutral, etc.
Number of channels	4U / 4I
Number of inputs	5U / 4I
Measurements	
Network frequencies	DC, 50 Hz, 60 Hz & 400 Hz
Voltage (measurement range)	10.00 V to 1,000 V _{AC/DC} @ 50/60 Hz 600 V _{AC} @ 400 Hz
Current	MN93 500 mA to 200 A _{AC}
	MN93A 5 mA to 100 A _{AC}
	C193 1 A to 1,000 A _{AC}
	AmpFlex® A193 & MiniFlex® MA193 200 mA to 10 kA _{AC}
	PAC93 1 A to 1,000 A _{AC} / 1 A to 1,300 A _{DC}
	E3N 50 mA to 10 A _{AC/DC} / 100 mA to 100 A _{AC/DC}
J93	50 to 3,500 A _{AC} / 50 to 5,000 A _{DC}
Calculated measurements	
Power	20 W to 10 GW 20 var to 10 Gvar 20 VA to 10 GVA
Energy	Up to 4 EWh / 4 EVAh / 4 Evarh (E = 10 ¹⁸)
Phase	cos φ, tan φ, PF
Harmonics	THD
Additional functions	
Phase sequence	Yes
Min / Max	Yes
Recording	
Sampling rate / Acquisition interval / Aggregation	128 samples./period 5 measurements/s From 1 min to 60 min
Data storage	8 GB SD card (SD-HC card up to 32 GB)
Communication	Ethernet, Bluetooth®, WiFi and USB
Power supply	Self-powered internally from 94 to 1,000 V @ 50-60 Hz & 400 Hz / DC
Safety	IEC 61010 - 1000 V CAT IV
Mechanical specifications	
Dimensions	245 x 270 x 180 mm
Weight	< 4 kg
Casing	IP67



TRMS VOLTAGE/CURRENT LOGGER



L562

Ref. : P01157060

600 V
CAT III300 V
CAT IV

TRMS



STRENGTHS

- Detects voltage drops and surges
- Monitors power consumption on single-phase networks, as well as energy consumption
- Up to 240,000 measurements saved in non-volatile memory
- Recording rate from 8/s to 1/day

SPECIFICATIONS

	L562	
Number of channels	2	
Connection	Current channel	Voltage channel
Input connection	BNC	Banana connector
Input range	0 to 1 V _{AC}	0 to 600 V _{AC}
Resolution	0,1 mV	0,1 V
Accuracy (50/60 Hz)	0 to 10 mV: not specified	0 to 5 V: not specified
	10 to 50 mV: ± (0,5 % R + 1 mV)	5 to 50 V: ± (0,5 % R + 1 V)
	50 to 1,000 mV: ± (0,5 % R + 0,5 mV)	50 to 600 V: ± (0,5 % R + 0,5 V)
Sampling rate	64 samples per period	
Storage interval	Programmable from 125 ms to 1 day	
Recording modes	Stop when full, FIFO, XRM™ extended recording mode and recording on alarms	
Recording duration	15 minutes to 8 weeks, programmable using DataView®	
Data storage	240,000 measurements (512 kB). The recorded data are stored in non-volatile memory, even if the battery is low or absent	
Communication	Optically-isolated USB 2.0	
Power supply	2 x 1.5 V LR06 batteries	
Battery life	100 hours to > 45 days (depending on recording interval/duration)	
Mechanical specifications		
Dimensions	136 x 70 x 32 mm	
Max. conductor sizes	Depends on current sensor	
Weight (with battery)	181 g	
Casing	UL94-V0	
Vibration	IEC 60068-2-6 (1,5 mm, 10 à 55 Hz)	
Shocks	IEC 60068-2-27 (30 G)	
Falls	IEC 60068-2-32 (1 m)	
Environment		
Operating temperature	-10 to +50 °C	
Storage temperature	-20 to +60 °C	

ADDITIONAL INFO

- Automatic report generation with the DataView® software

CONTENTS

- L562 delivered with:
 - 1 USB cable 2 m long, type A to mini-B 5-pin
 - PC communication software
 - 2 banana leads 1.5 m long
 - 2 crocodile clips
 - 2 x 1.5 V LR06 alkaline batteries

ACCESSORIES / REPLACEMENT PARTS

- Standard PVC leads with straight 4 mm male plugs P01295288Z
- 32 A crocodile clips P01102052Z
- See all the accessories on page 144



CL601

Ref.: P01157010

600 V
CAT III300 V
CAT IV

TRMS

STRENGTHS

- Stand-alone with safe connections
- Alarm function
- Overload indication
- Monitoring of machine loads, electrical troubleshooting, etc.

SPECIFICATIONS

	CL601
Number of channels	1
Input connection	Split-phase current transformer AC current
Current range	0 to 600 A _{AC}
Resolution	0,1 A
Accuracy (50/60 Hz)	0 to 5 A: not specified 5 to 50 A: $\pm(1\% R + 1 A)$ 50 to 400 A: $\pm(1\% R + 0.5 A)$ 400 to 600 A: $\pm(3\% R + 1 A)$
Sampling rate	64 samples per period
Storage interval	Programmable from 125 ms to 1 day
Storage modes	Start/end, FIFO and XRM™ extended recording mode
Recording duration	15 minutes to 8 weeks, programmable using DataView®
Data storage	240,000 measurements (512 kB). The recorded data are stored in non-volatile memory, even if the battery is low or absent
Communication	Optically-isolated USB 2.0
Power supply	2 x 1.5 V LR06 batteries
Battery life	100 hours to > 45 days (depending on recording interval/duration)
Mechanical specifications	
Dimensions	235 x 102 x 41 mm
Max. conductor size	1 conductor \varnothing 42 mm, 2 conductors each with \varnothing 25.4 mm
Weight (with batteries)	485 g
Electrical safety	IEC 61010, 300 V CAT IV / 600 V CAT III
Casing	UL94-V0
Vibration	IEC 60068-2-6 (1.5 mm, 10 to 55 Hz)
Shocks	IEC 60068-2-27 (30 G)
Falls	IEC 60068-2-32 (1 m)
Environment	
Operating temperature	-10 to +50 °C
Storage temperature	-20 to +60 °C

ADDITIONAL INFO

- Automatic report generation

CONTENTS

- CL601 delivered with:
 - 1 USB cable 2 m long, type A to mini-B
 - 5 pins
 - PC communication software
 - 2 x 1.5 V LR06 batteries



TRMS CURRENT LOGGERS



L101 - L102 - L111

Ref. : P01157020 P01157030 P01157080

50 V
CAT III

TRMS

STRENGTHS

- **L101** records on request and can be used to monitor current on 1 channel
- **L102** can be used to monitor the neutral current in relation to the earth, as well as split-phase loads. It is equipped with 2 independent channels
- **L111** has the same function as the L101 but with single-channel connection via banana socket for clamps with current output

SPECIFICATIONS

	L101	L102	L111
Number of channels	1	2	1
Input connection	BNC	One BNC connector per channel	2 flush-mounted banana sockets
Current range	0 to 1 Vac depending on sensor		
Resolution	0,1 mV		0,1 mA
Accuracy (50/60 Hz)	0 to 10 mV: not specified 10 to 50 mV: ± (0.5 % R + 1 mV) 50 to 1,000 mV: ± (0.5 % R + 0.5 mV)		0 to 10 mA: not specified 10 to 50 mA: ± (0.5 % R + 1 mA) 50 to 1,000 mA: ± (0.5 % R + 0.5 mA)
Sampling rate	64 samples per period		
Storage interval	Programmable from 125 ms to 1 day		
Storage modes	Start/end, FIFO, XRM™ extended recording mode and recording on alarms		
Recording duration	15 minutes to 8 weeks, programmable using DataView®		
Data storage	240,000 measurements (512 kB). The recorded data are stored in non-volatile memory, even if the battery is low or absent		
Communication	Optically-isolated USB 2.0		
Power supply	2 x 1.5 V LR06 batteries		
Battery life	100 hours to > 45 days (depending on recording interval/duration)		
Mechanical specifications			
Dimensions	136 x 70 x 32 mm		132 x 70 x 32 mm
Max. conductor size	Depends on current sensor		
Weight (with batteries)	180 g		
Electrical safety	IEC 61010, 50 V CAT III		
Casing	UL94-V0		
Vibration	IEC 60068-2-6 (1,5 mm, 10 to 55 Hz)		
Shocks	IEC 60068-2-27 (30 G)		
Falls	IEC 60068-2-32 (1 m)		
Environment			
Operating temperature	-10 to +50 °C		
Storage temperature	-20 to +60 °C		

ADDITIONAL INFO

- Automatic report generation

CONTENTS

- **L101** and **L102** delivered with:
 - 1 USB cable 2 m long, type A to mini-B 5-pin
 - PC communication software
 - 2 x 1.5 V LR6 batteries
- **L111** delivered with:
 - 1 USB cable 2 m long, type A to mini-B 5-pin
 - PC communication software
 - 2 x 1.5 V LR06 batteries

ACCESSORIES / REPLACEMENT PARTS

- Bag with carrying strap P01298076
- USB cable 2 m long, type A to mini-B 5-pin Contact us
- See all the accessories on page 144



ML912

Ref.: P01157130

600 V
CAT III300 V
CAT IV

STRENGTHS

- Two MiniFlex® flexible current sensors for measuring currents from 0.5 A to 1,000 A
- Two ranges: 100 / 1,000 Aac
- Monitoring of loads on the phase
- Intermittent fault detection
- Monitoring of current harmonics

SPECIFICATIONS

	ML912	
Number of channels	2	
Input connection	Built-in MiniFlex® flexible AC current sensors	
Range	0.5 to 100 Aac	5 to 1,000 Aac
Resolution	0.1 mA	0.1 V
Accuracy	0 to 1 A: not specified 1 to 100 A: ±(1 % R + 0.5 A)	0 to 5 A: not specified 5 to 1,000 A: ±(1 % R + 1 A)
Sampling rate	64 samples per period	
Storage interval	Programmable from 125 ms to 1 day	
Storage modes	Start/stop, FIFO, XRM™ extended recording mode and recording on alarms	
Recording duration	15 minutes to 8 weeks, programmable using DataView®	
Data storage	240,000 measurements (512 kB). The recorded data are stored in non-volatile memory, even if the battery is low or absent	
Communication	Optically-isolated USB 2.0	
Power supply	2 x 1.5 V LR06 batteries	
Battery life	100 hours to > 45 days (depending on recording interval/duration)	
Mechanical specifications		
Dimensions	136 x 70 x 32 mm without sensor	
Weight (with batteries)	245 g	
Electrical safety	IEC 61010-1, 600 V CAT III, 300 V CAT IV, Pollution degree 2	
Casing	UL94-V0	
Vibration	IEC 60068-2-6	
Shocks	IEC 60068-2-27 (30 G)	
Falls	IEC 60068-2-32 (1 m)	
Environment		
Operating temperature	-10 to +50 °C	
Storage temperature	-20 to +60 °C	
Safety - electromagnetic compatibility		
Safety	IEC 61010-1 ; 600 V CAT IV ; Pollution degree 2	
Protection	IP40	

ADDITIONAL INFO

- Automatic report generation

CONTENTS

- ML912 delivered with:
 - 1 USB cable 2 m long, type A to mini-B 5-pin
 - PC communication software
 - 2 x 1.5 V LR06 batteries

ACCESSORIES / REPLACEMENT PARTS

- Bag with carrying strap P01298076
- USB cable 2 m long, type A to mini-B 5-pin Contact us
- See all the accessories on page 144



CURRENT LOGGERS WITH FLEXIBLE SENSORS



ML914 - AL834

Ref. : P01157135

P01157140

600 V
CAT IV

1000 V
CAT III

IP
65



TRMS

STRENGTHS

- Compact current loggers with flexible sensors
- TRMS measurements up to 1,000 Aac (ML914) or 3,000 Aac (AL 834)
- Safe, accessible, risk-free measurements via the Bluetooth communication function
- DataView® software for effective analysis of your measurements

CONTENTS

- ML 914 delivered with:
 - PC communication software
 - 4 type-C batteries
 - 1 CD-ROM containing the user manual
 - 1 safety datasheet
- AL 834 delivered with:
 - PC communication software
 - 4 x 1.5 V LR14 batteries
 - 1 CD-ROM containing the user manual
 - 1 safety datasheet

ACCESSORIES / REPLACEMENT PARTS

- DataView® software P01102095
- Bag no. 23 P01298078
- See all the accessories on page 144

SPECIFICATIONS

	ML914		AL 834	
Number of channels			4	
Type of sensor	Built-in MiniFlex®		Built-in flexible sensors	
Range	100 A	1,000 A	300 A	3,000 A
Accuracy (50/60 Hz)	0 to 1 A: not specified 1 to 100 A: ± (1% R + 0.5 A)	0 to 5 A: not specified 5 to 1,000 A: ± (1% R + 1 A)	0 to 5 A: not specified 1 to 300 A: ± (1% R + 0.5 A)	0 to 15 A: not specified 15 to 3,000 A: ± (1% R + 1 A)
Resolution	0.1 V			
Sampling rate	64 samples per period			
Acquisition interval	Programmable from 125 ms to 1 day			
Storage modes	Start/stop, FIFO, XRM™ extended mode and on alarm			
Recording duration	15 minutes to 8 weeks, programmable using DataView®			
Data storage	1,000,000 measurements (2 MB)			
Communication	Bluetooth® (Class 2)			
Power supply	4 x 1.5 V LR14 batteries			
Battery life	Up to 180 days			
Safety	IEC 61010 600 V CAT IV and 1000 V CAT III			
Mechanical specifications				
Dimensions	150 x 150 x 90 mm without sensor		150 x 150 x 91 mm without sensor	
Max. conductor size	45 mm		203 mm	
Weight	1.1 kg		1.77 kg	
Casing	IP50 as per IEC 60529		IP65 as per IEC 60529	



L261 - L481

Ref.: P01157040 P01157110

600 V
CAT III

300 V
CAT IV



TRMS



STRENGTHS

- **L261**
 - 600 Vac/dc TRMS
 - Suitable for industrial, commercial or residential monitoring
 - Recording of voltage drops and surges
- **L481**
 - 850 Vdc
 - Voltage monitoring on machines, wind turbines, railway applications, etc.
 - Detection of intermittent voltage faults

SPECIFICATIONS

	L261	L481
Number of channels	1	
Input connection	2 flush-mounted banana sockets	
Current range	0 to 600 V _{AC} /dc	-850 V _{DC} to +850 V _{DC}
Accuracy (50/60 Hz)	0 to 5 V: not specified	0 to 5 V: not specified
	5 to 50 V:	5 to 50 V:
	± (0.5 % R + 1 V)	± (0.5 % R + 1 V)
	50 to 600 V:	50 to 850 V:
	± (0.5 % R + 0.5 V)	± (0.5 % R + 0.5 V)
Resolution	0.1 V	
Sampling rate	64 samples per period	8 samples per second
Storage interval	Programmable from 125 ms to 1 day	
Storage modes	Start/stop, FIFO, XRM™ extended measurement mode and recording on alarms	
Recording duration	15 minutes to 8 weeks, programmable using DataView®	
Data storage	240,000 measurements (512 kB). The recorded data are stored in non-volatile memory, even if the battery is low or absent	
Communication	Optically-isolated USB 2.0	
Power supply	2 x 1.5 V LR06 batteries	
Battery life	100 hours to > 45 days (depending on recording interval/duration)	
Mechanical specifications		
Dimensions	125 x 70 x 32 mm	
Weight (with batteries)	180 g	
Electrical safety	IEC 61010-1, 600 V CAT III, 300 V CAT IV, Pollution degree 2	
Casing	UL94-V0	
Vibration	IEC 60068-2-6 (1.5 mm, 10 to 55 Hz)	
Shocks	IEC 60068-2-27 (30 G)	
Falls	IEC 60068-2-32 (1 m)	
Environment		
Operating temperature	-10 to +50 °C	
Storage temperature	-20 to +60 °C	

ADDITIONAL INFO

- Automatic report generation

CONTENTS

- **L261** and **L481** delivered with:
 - 1 USB cable 2 m long, type A to mini-B 5-pin
 - PC communication software
 - 2 banana leads
 - 2 voltage leads 1.5 m long
 - 2 crocodile clips
 - 2 x 1.5 V LR06 batteries

ACCESSORIES / REPLACEMENT PARTS

- Standard PVC leads with 4 mm straight male plugs P01295288Z
- 32 A crocodile clips P01102052Z
- See all the accessories on page 144



CHOOSE YOUR PHYSICAL MEASUREMENT LOGGER



L452
page 137



L642
page 138

Number of inputs	2	2
Process		
4-20 mA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0-10 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Temperature	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Programmable storage interval	5 s to 1 day	125 ms to 1 day



ADDITIONAL INFO

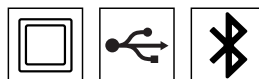
- To simplify its use, the L452 is equipped with a magnetized rear panel. You can also use the Multifix system or a wall mount.

CONTENTS

- 1 L452 logger
- 1 adapter and 1 μ USB power cable
- 1 CD-ROM containing the Datalogger Transfer software

L452

Ref.: P01157201



STRENGTHS

- Process data logger with display
- 2 measurement channels
- Events counter
- Dry contact closure
- Detection of logic levels

SPECIFICATIONS

	L452			
	Measurement range	Resolution	Accuracy (% reading)	Sampling
Current DC	4 to 20 mA	0.01 mA	0.05 mA (0.25 %)	5 samples/s
	± 100 mV	± 0.1 mV	± 0.1 mV (0.5 %)	
Voltage DC	± 1 V	± 1 mV	± 1 mV (0.5 %)	5 samples/s
	± 10 V	± 10 mV	± 10 mV (0.5 %)	
Impulsion	-	1 ms	-	-
Digital	-	1 ms	1 s (for recording for 1 month max.)	-
Pulse voltage	3.3 V (with 1,000,000 Ω pull-up)			
Battery life	Acquisition 200 ms, display on: 18 days Acquisition 200 ms, display off: 36 days Acquisition 1 min, display off: 270 days			
Power supply	110 to 240 V (50/60 Hz) – External: via USB connector Internal: 2.4 V rechargeable NiMH batteries (2 x 1.2 V)			
Storage modes	Start/Stop (stop when memory full or when campaign end date is reached)			
Control	Local mode (multi-directional keypad on front panel) Remote mode (control via PC)			
Recording duration	10 minutes to 1 year, configurable			
Examples	2 channels @ 200 ms: 19 days 2 channels @ 1 min: > 1 year (theoretically)			
Acquisition interval	200 ms to 1 hour			
Communication	Bluetooth 2.1, Class 1, USB 2.0			
Dimensions	32.4 x 65.5 x 125 mm (137.5 mm with screw connector)			
Weight	206 g			
Display	LCD 128 x 64 pixels			
Measurement terminal strip	6 screw terminals			
Operating temperature	0 to 50 °C			
Protection	IP42 (terminal block IP20)			
Electrical protection	IEC 61010-1 Ed. 3 and IEC 61010-2-030 Ed. 1			

ACCESSORIES / REPLACEMENT PARTS

- μ USB power-supply cable P01102148
- Screw-connector kit (x5) P01295489
- See all the accessories on page 144



TEMPERATURE LOGGER



L642

Ref. : P01157050

50 V
CAT III

STRENGTHS

- Monitoring of processes, heating systems and air-conditioning
- 2 input channels for thermocouple (J, K, T, N, E, R, S)
- Storage interval programmable from 1 every 5 seconds up to 1 per day
- Choice of 4 recording modes
- Up to 240,000 measurements saved in non-volatile memory

SPECIFICATIONS

	L642
Number of channels	2
Input connection	2 miniature thermocouple connectors
Measurement range	°C (°F)
j	-210 to +1,200 (-346 to +2,192)
k	-200 to +1,372 (-328 to +2,501)
t	-250 to +400 (-418 to +752)
n	-200 to +1,300 (-328 to +2,372)
E	-150 to +950 (-238 to +1,742)
R	0 to 1,767 (32 to 3,212)
S	0 to 1,767 (32 to 3,212)
Resolution	0.1 °C/F < 1,000 °C/F; 1 ° ≥ 1,000 °C/F
Accuracy (50/60 Hz)	0.1 % to 0.2 % + 0.6 ° at 1 ° depending on thermocouple range and type
Sampling rate	8 samples acquired at the storage interval
Storage interval	Programmable from 5 s to 1 day
Storage modes	Start-end, FIFO, XRM™ extended recording mode and recording on alarms
Recording duration	15 minutes to 8 weeks, programmable using DataView®
Data storage	240,000 measurements (512 kB). The recorded data are stored in non-volatile memory, even if the battery is low or absent
Communication	Optically-isolated USB 2.0
Power supply	2 x 1.5 V LR06 batteries
Battery life	100 hours to > 45 days (depending on recording interval/duration)
Mechanical specifications	
Dimensions	125 x 70 x 32 mm
Weight (with batteries)	200 g
Casing	UL94-V0
Vibration	IEC 60068-2-6 (1,5 mm, 10 to 55 Hz)
Shocks	IEC 60068-2-27 (30 G)
Falls	IEC 60068-2-32 (1 m)
Environment	
Operating temperature	-10 to +50 °C
Storage temperature	-20 to +60 °C

ADDITIONAL INFO

- Automatic report generation

ACCESSORIES / REPLACEMENT PARTS

- SK6 flexible K thermocouple _____ P03652906
- Bag with carrying strap _____ P01298076
- See all the accessories on page 144

CONTENTS

- L642 delivered with:
 - 1 USB cable 2 m long, type A to mini-B 5-pin
 - PC communication software
 - 2 x 1.5 V LR06 batteries

CHOOSE YOUR SOLAR POWER ANALYSER



FTV 100
page 140



FTV 200
page 141

Solar power installation tester		
Solar panel tester		
DC voltage measurement		
DC current measurement		
AC voltage measurement		
AC current measurement		
Temperature measurement		
Insolation measurement		
Calculation of the installation's overall efficiency		
Calculation of inverter efficiency		
I / V curve in Standard Test Conditions		
Library of panels		
Report software		



FTV 100

Ref. : P01160700

1000 V
CAT III600 V
CAT IVIP
54

STRENGTHS

- Calculation of solar power installation efficiency
- Testing of solar power installation energy efficiency
- Electrical power survey
- Calculation of DC/AC inverter efficiency
- Simultaneous measurements on 1, 2 or 3 rows of panels installed in parallel

SPECIFICATIONS

	FTV 100		
Display	Large 5.7" extra-bright colour digital LCD screen (320 x 240) with anti-reflective treatment		
Inputs	Functions	Range	Accuracy
Pyranometer	Solar irradiance measurement	0 to 2,000 W/m ²	± 2 %
Environmental temperature	Measurement with Pt100 sensor	-30 °C to +80 °C	± 1 % ± 1 °C
Solar panel temperature	Measurement with Pt100 sensor	-30 °C to +120 °C	± 1 % ± 1 °C
DC voltage	1 to 3 inputs	1,000 V _{DC}	± 1 %
DC current	1 to 3 inputs	1,400 A _{DC}	± 1 %
AC voltage	1 to 3 inputs	600 V _{AC}	± 1 %
AC current	1 to 3 inputs	3,000 A _{AC}	± 1 %
Functions			
Calculation functions	Efficiency of solar panels with compensation of the modules' temperature coefficient Efficiency of DC/AC conversion by the inverter		
Data logger	Up to 10 instrument configurations pre-recorded in memory (measurements and results)		
Specifications			
Communication	RS232 (remote unit) + USB (PC)		
Internal power supply	Built-in rechargeable Li-Ion battery (4.5 Ah) Battery life 8 hours		
External power supply	230 Vac - 50 Hz external power supply		
Protection	IP67 closed / IP54 open		
Dimensions / weight	360 x 304 x 194 mm / 3 kg		
Electrical safety	IEC 61010-1 - 600 V CAT IV / 1 000 V CAT III		

ADDITIONAL INFO

- Particularly easy to read, even in direct sunlight, thanks to the anti-reflective treatment
- The FTV 100 is also available in a version with 3 DC inputs plus 3 PAC10-FTV DC current clamps and 3 MN-FTV AC clamps — P01160720

CONTENTS

- FTV100 with 1 DC input plus A PAC10-FTV DC current clamp and 3 MN-FTV AC clamps delivered with:
- 1 IP67 site-proof case
- 1 pyranometer for insolation with 5 m cable
- 1 Pt100 sensor for environment temperature with 3 m cable
- 1 Pt100 sensor for panel temperature with 3 m cable
- 3 AC current clamps (MN-FTV) with 3 m cable
- 1 DC current clamp (PAC10-FTV) with 3 m cable
- 4 x 3 m leads with test probes
- 1 rechargeable battery with mains adapter
- Data processing software
- 1 bag
- 1 certificate of conformity

ACCESSORIES / REPLACEMENT PARTS

- 3 -DC-input installation measurement kit comprising:
2 PAC current clamps (PAC10-FTV) with 3 m cable,
2 sets of leads with test probes (3 m) — P01160710
- GREENTEST FTV100 REMOTE unit comprising:
4 x 1.5 V LR6 batteries,
2 x RS232 M/M connectors for soldering,
1 mounting strap — P01160736
- See all the accessories on page 144



FTV 200

Ref. : P01160745

600 V
CAT IVIP
54EN
60891

STRENGTHS

- Solar panel testing
- I-V curves of all types of solar panels
- Excellent display resolution: 500 measurement counts per curve with zoom
- Measurement of temperature, solar irradiance, peak power, Voc, Isc, etc.
- The specifications of thousands of types of solar panels are referenced in the integrated library

SPECIFICATIONS

	FTV 200
Screen	4.3" colour graphical LCD touch screen
Library	10,000 curves (with panel reference values / manufacturer)
Functions	
Voltage DC	10 to 1,000 V
Current DC	0.1 to 10 A
Power	10 W to 10 kW
Radiation	By pyranometer / 0 to 2,000 W/m ²
Temperature	by Pt100 - 20°C to +100°C
I-V graph	Graphic display of voltage/current measurement per panel or string
MPP graph	Graphic display of maximum power point (MPP)
General specifications	
Communication	USB 2.0
Power supply / battery life	Mains or rechargeable Li-Ion battery pack / 12 hours on battery
Safety	IEC 61010, CAT III 600 V
Operating temperature	-5°C to +40°C
Dimensions/weight	270 x 250 x 130 mm / 2.5 kg

ADDITIONAL INFO

- The FTV 200 is also available in a complete version delivered with 1 professional pyranometer and a Pt100 sensor

P01160740

CONTENTS

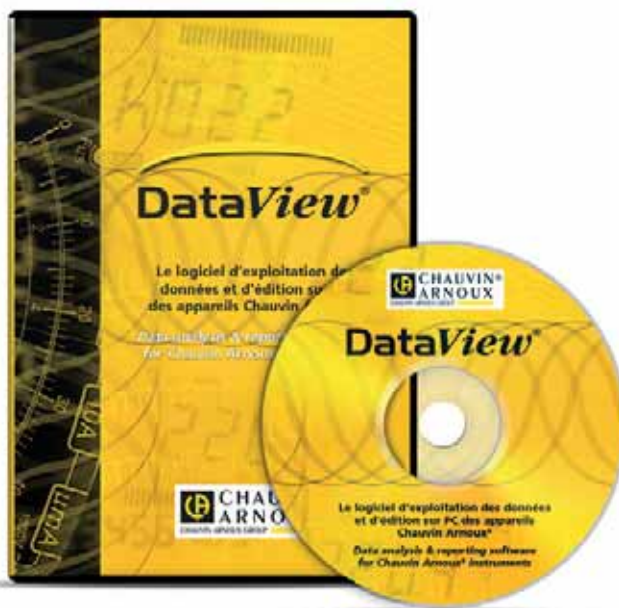
- FTV 200 delivered with:
 - 1 bag
 - 1 set of cables 3 m long
 - 1 set of MC4 adapters (red/black)
 - 1 MC4/banana Ø 4 mm adapter
 - 1 magnetic stylus for touch screen
 - 1 USB key
 - 1 mains adapter
 - 1 set of flexible test probes
 - PC software
 - 1 certificate of conformity

ACCESSOIRES / RECHANGES

- Pyranometer P01160730
- Pt100 ambient temperature sensor P01160731
- See all the accessories on page 144



DATA PROCESSING SOFTWARE



DATAVIEW®

Ref. : P01102095

PAT

PAT 2

PEL
TRANSFER

DATA
LOGGER

FUNCTIONS

- Configuration of all the functions of instruments connected to a PC or via Bluetooth®
- Recovery of recorded measurement data
- Backup of measurement files
- Opening of saved files
- Processing and report creation (EN50160)
- Export into an Excel spreadsheet
- Export in .pdf format
- Database management

POWER ANALYZER TRANSFER 2 FOR C.A 8331 / C.A 8336

The PAT 2 module in DataView® offers additional functions:

- Configuration of alarms
- Configuration of transients
- Configuration of trend curves
- Real-time display
- Data recovery, backup and export
- Measurement campaign start after automatic configuration of the associated instrument.

REQUIRED CONFIGURATION

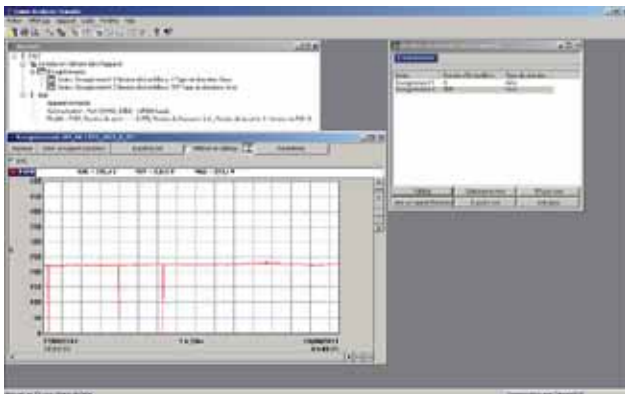
- Windows Vista & Windows 7/8/10 (32/64 bit)
- 1 GB RAM for Windows Vista & Windows 7/8 (32 bit)
- 2 GB RAM for Windows Vista & Windows 7/8 (64 bit)
- 80 MB available hard-disk space (200 MB recommended)

ADDITIONAL INFO

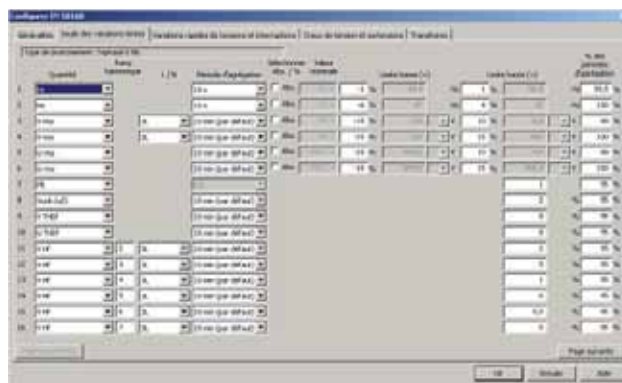
- The DataView® software:
- Automatically recognizes the instrument connected when it is hooked up to the PC and opens the corresponding menu. Users then have direct access to its configuration and the data stored on it
- Equipped with a large number of predefined report templates for quick generation in accordance with the applicable standards. Users can also create their own templates to meet their needs and directly add their own comments

DataView® modules	PAT	PAT 2	PEL TRANSFER	DATALOGGER
Associated products	F407	C.A 8331	PEL 102	L 562
	F607	C.A 8333	PEL 103	CL601
	C.A 8220	C.A 8336	PEL 105	L101
	C.A 8230	C.A 8435		L102
				L111
				ML912
				ML914
				AL834
				L261
				L481
				L452
				L642

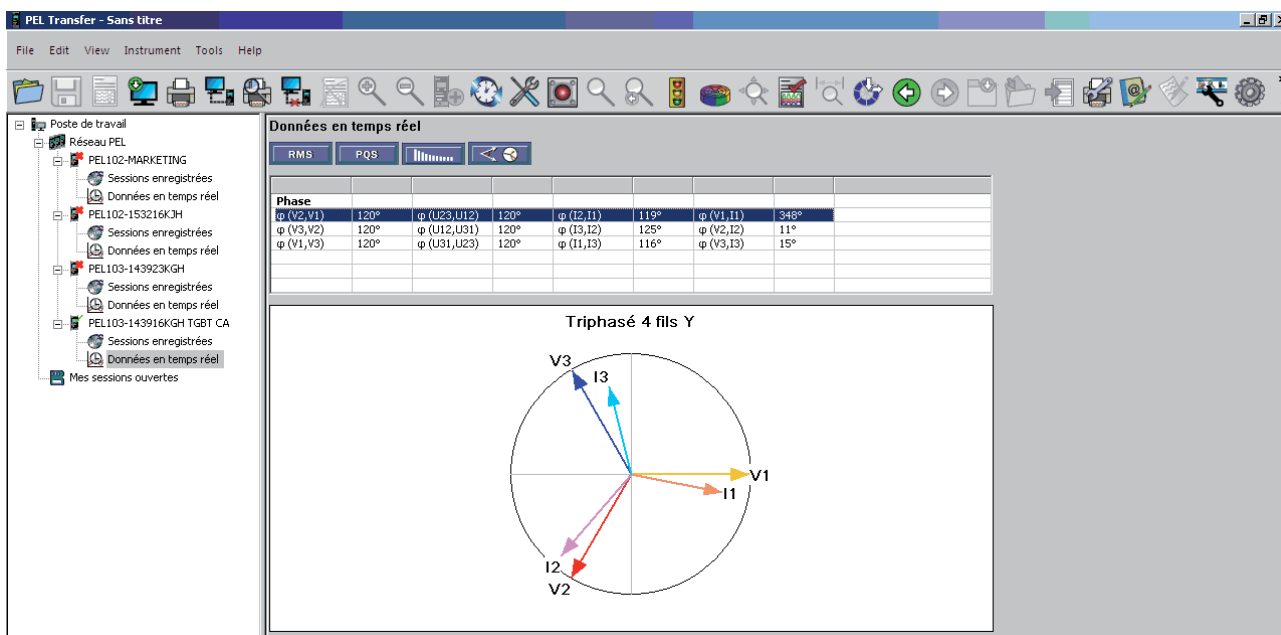
ENERGY QUALITY & INSTALLATION MONITORING



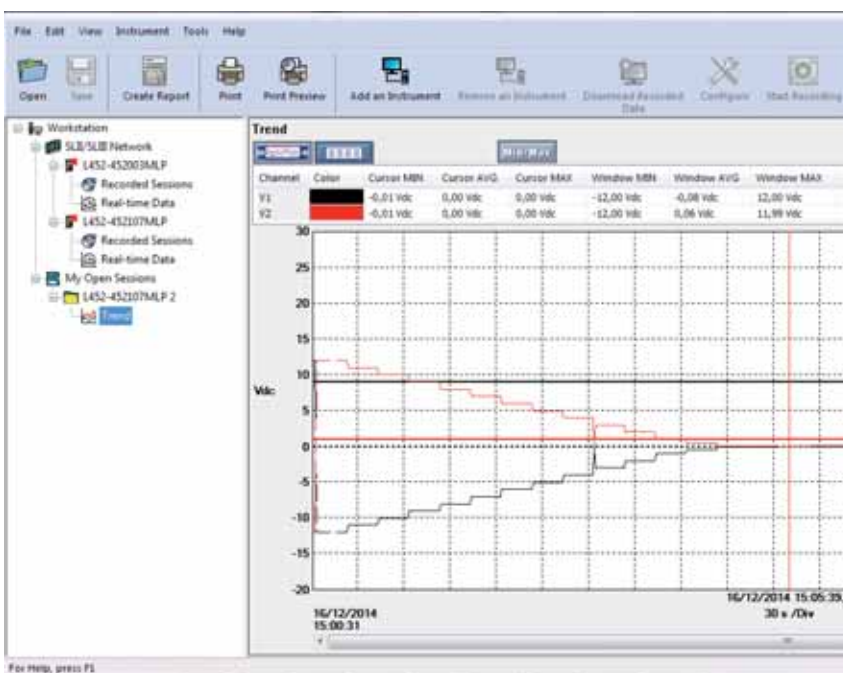
PAT MODULE Display of data stored by an F407 clamp



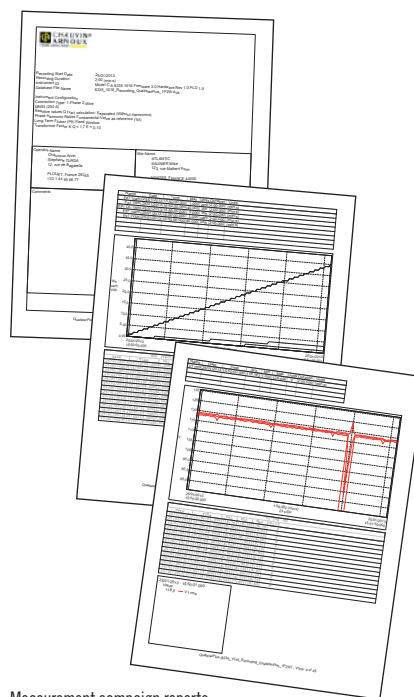
PAT 2 MODULE Configuration of EN 50160 parameters



PEL TRANSFER MODULE Remote display of a vectorial representation



DATA LOGGER MODULE Recording of 0 -10 V - 2 channels











Measurement campaign reports












ACCESSORIES / REPLACEMENT PARTS

POWER AND ENERGY QUALITY ANALYSERS AND LOGGERS

C.A 8220, C.A 8230, C.A 8331, C.A 8333, C.A 8336, C.A 8435, PEL 102, PEL 103 and PEL 105

	MODEL	MEASUREMENT RANGE	CLAMPING Ø / LENGTH	IEC 61010	REFERENCE
CURRENT SENSORS	 MN93	500 mA to 200 A _{AC}	Ø 20 mm	600 V CAT III / 300 V CAT IV	P01120425B
	 MN 93A	5 mA to 100 A _{AC}	Ø 20 mm	600 V CAT III / 300 V CAT IV	P01120434B
	 MA193-250 MA193-350 MA196-350	100 mA to 10 kA _{AC}	Ø 70 mm / 250 mm Ø 100 mm / 350 mm Ø 100 mm / 350 mm	1000 V CAT III / 600 V CAT IV	P01120580 P01120567 P01120568
	 PAC93	1 A to 1,000 A _{AC} / 1 A to 1,300 A _{DC}	1 x Ø 39 mm or 2 x Ø 25 mm	600 V CAT III / 300 V CAT IV	P01120079B
	 J93	50 A to 3,500 A _{AC} / 50 A to 5,000 A _{DC}	Ø 72 mm	600 V CAT III / 1000 V CAT IV	P01120110
	 A193-450 A196A-610	100 mA to 10 kA _{AC}	Ø 140 mm / 450 mm Ø 190 mm / 610 mm	1000 V CAT III / 1000 V CAT IV	P01120526B P01120554
	 A193-800	100 mA to 10 kA _{AC}	Ø 250 mm / 800 mm	1000 V CAT III / 600 V CAT IV	P01120531B
	 C193	1 A to 1,000 A _{AC}	Ø 52 mm	600 V CAT IV	P01120323B
	 E3N	50 mA to 10 A _{AC/DC} 100 mA to 100 A _{AC/DC}	Ø 11.8 mm	600 V CAT III / 300 V CAT IV	P01120043A

	DESCRIPTION	REFERENCE
OTHER ACCESSORIES	 Kit of 5 banana leads + 5 crocodile clips + 1 set of coloured rings	P01295483
	 Kit of 4 banana leads + 4 crocodile clips + 1 set of coloured rings	P01295476
	 1 set of coloured inserts and rings	P01102080
	 5 A adapter unit	P01101959
	 Reeling box - MultiFix magnetized casing	P01102149
	 USB-A USB-B lead	P01295293
	 Bag no. 22	P01298056
	 DataView® software	P01102095
	 ESSAILEC casing	P01102131



ACCESSORIES / REPLACEMENT PARTS

CURRENT SENSORS FOR LOGGERS (EXCLUDING PEL)

		MODÈLE	MEASUREMENT RANGES	OUTPUT SIGNAL	PHASE SHIFT*	MAX. CONDUCTOR SIZE		OUTPUT CONNECTION	COMPATIBLE PRODUCTS	REFERENCE
			AC	VOLTAGE		Ø CABLE	BUSBAR			
VOLTAGE OUTPUT		E3N	100 mA to 10 A 1 to 100 A	100 mV/A _{AC} 10 mV/A _{AC}	< 1.5°	11.8 mm	—	BNC lead	L101 L102 L562	P01120043A
		MN 60	0.1 to 24 A 0.5 to 240 A	100 mV/A _{AC} 10 mV/A _{AC}	< 2.5°	19.8 mm	—	BNC lead		P01120409
		PAC 12	0.2 to 40 A 0.5 to 400 A	10 mV/A _{AC} 1 mV/A _{AC}	< 1.5°	One cable: 30 mm Two: 24 mm	Two 31,5 x 10 mm	BNC lead		P01120072
		PAC 22	0.2 to 100 A 0.5 to 1,000 A	10 mV/A _{AC} 1 mV/A _{AC}	< 1.5°	One cable: 39 mm Two: 25 mm	One 50 x 12 mm Two 50 x 5 mm	BNC lead		P01120073
		C160	0.1 to 10 A 0.1 to 100 A 1 to 1,000 A	100 mV/A _{AC} 10 mV/A _{AC} 1 mV/A _{AC}	< 1°	52 mm	50 x 5 mm	BNC lead		P01120308
		D38N	1 to 30 A 1 to 300 A 1 to 3,000 A	10 mV/A _{AC} 1 mV/A _{AC} 0,1 mV/A _{AC}	< 1°	64 mm 64 x 100 mm	50 x 135 mm	BNC lead		P01120057A
CURRENT OUTPUT		MN11	0.5 to 240 A	1 mA/A _{AC}	< 2.5°	19.8 mm	—	Wire cable with reinforced or double insulation 1.5 m long and terminated by 2 elbowed male banana safety plugs Ø 4 mm	L111	P01120404
		C103	0.1 to 1,200 A	1 mA/A _{AC}	< 0.5°	52 mm	50 x 5 mm	Wire cable with reinforced or double insulation 1.5 m long and terminated by 2 elbowed male banana safety plugs Ø 4 mm		P01120303

*Maximum rated phase shift



ACCESSORIES / REPLACEMENT PARTS

POWER AND ENERGY QUALITY ANALYSER

C.A 8220

■ C.A 1711 tachometer probe	P01102082
■ 2-wire Pt100 adapter	HX0091

C.A 8220 / C.A 8230

■ E3N clamp adapter	P01102081
■ E3N clamp + mains adapter	P01120047
■ Bag no. 5	P01298049
■ Crocodile clips (1 red/1 black)	P01102057Z
■ Banana/banana leads (1 red/1 black)	P01295288Z
■ Test probes (1 red/1 black)	P01295454Z
■ Pack of 6 NiMH rechargeable batteries	P01296037
■ C.A 82X0 EUR mains power supply	P01160640
■ Optical/USB cable	HX0056Z
■ Current measurement lead	P03295509
■ PAC93 mains adapter	P01101967
■ DataView® software	P01102095
■ Set of 2 magnetized test probes (1 red / 1 black)	P01103058Z

THREE-PHASE POWER AND ENERGY QUALITY ANALYSER

C.A 8331 / C.A 8333 / C.A 8336 / C.A 8435

■ Belt bag no. 21	P01298055
■ Screen protection film	P01102059
■ Qualistar bag no. 06	P01298051
■ In-vehicle charger	HX0061
■ E3N adapter	P01102081
■ E3N mains power pack	P01120047
■ Battery pack	P01296024
■ PA30W mains power pack (C.A 8331-33-35-36)	P01102057
■ PA31ER mains adapter	P01102150
■ PAC93 mains adapter	P01101967
■ DataView® software	P01102095
■ Set of 2 magnetized test probes (1 red / 1 black)	P01103058
■ Bag no. 22	P01298067

C.A 8435

■ Set of IP65 banana leads 3 m long (x5)	P01295479
■ Set of rubber caps (5 small + 4 large)	P01102117
■ Bag no. S21	P01298066

POWER AND HARMONICS MULTIMETER CLAMP

F407, F607

■ Set of red/black banana/banana leads	P01295451Z
■ Set of red/black crocodile clips	P01295457Z
■ Magnetized MultiFix kit	P01102100Z
■ Bluetooth kit	P01637301
■ Bag no. S03	P01298076
■ DataView® software	P01102095
■ Set of 2 magnetized test probes (1 red / 1 black)	P01103058Z

POWER AND ENERGY LOGGERS

PEL 102 and PEL 103

■ Bag no. 23	P01298078
■ E3N adapter	P01102081
■ MultiFIX	P01102100Z
■ Mains power cable	P01295174
■ Mains adapter	P01102134
■ PAC93 mains adapter	P01101967
■ DataView® software	P01102095
■ Set of 2 magnetized test probes (1 red / 1 black)	P01103058Z

PEL 105

■ Set of rubber caps (5 small + 4 large)	P01102147
■ Pole mounting kit	P01102146
■ Crocodile clips kit (x5)	P01102099
■ E3N adapter	P01102081
■ Set of IP 67 banana leads 3 m long (x5)	P01295479
■ DataView® software	P01102095
■ Bag no. S21	P01298066
■ PA30W mains adapter	P01102057
■ Set of 2 magnetized test probes (1 red / 1 black)	P01103058Z

SOLAR POWER ANALYSER

FTV 100 / FTV200

■ Pyranometer	P01160730
■ Pt100 ambient temperature sensor	P01160731
■ Pt100 contact temperature sensor	P01160732
■ FTV remote unit	P01160736



ACCESSORIES / REPLACEMENT PARTS

FTV 100

■ 3-DC-input installation measurement kit: 2 PAC current clamps (PAC10-FTV) with 3 m cable, 2 sets of leads with test probes (3 m)	P01160710
■ GREENTEST FTV100 REMOTE unit: 4 x 1.5 V batteries, 2 RS232 M/M connectors for soldering, 1 mounting strap	P01160736
■ «Cable» communication kit: 1 series cable 15 m long, RS232 M/M 9-pin connectors	P01160737
■ «Bluetooth» communication kit: 2 Bluetooth adapters (transmitter/receiver), 2 RS232 M/F and M/M series cables 20 cm long, adapter programming software	P01160738
■ PAC10-FTV DC clamp (200 A _{DC})	P01160734
■ PAC20-FTV DC clamp (1,400 A _{DC})	P01120092
■ MN13-FTV AC clamp (200 A _{AC})	P01160733
■ C107-FTV AC clamp (1,000 A _{AC})	P01120337
■ D43-FTV AC clamp (3,000 A _{AC})	P01120100
■ Set of crocodile clips ø 4 mm (R/B)	P01102052Z
■ FTV100 rechargeable battery	P01160735

SOLAR POWER ANALYSER

FTV 200

■ Bluetooth® FTV-200 communication kit	P01160739
■ Bag	P01298066
■ USB/RS232 adapter	HX0055
■ Inclinator	P01102115
■ Flexible test probes	P01102116
■ MC4 (1 red/ 1 black) adapters	P01102119

TRMS VOLTAGE/CURRENT LOGGER

L562

■ Standard PVC leads with 4 mm straight male plugs	P01295288Z
■ 32 A crocodile clips	P01102052Z
■ Bag with carrying strap	P01298076
■ USB cable 2 m long, type A to mini-B	Contact us
■ Banana plug/female BNC adapter	P01101846
■ DataView® software	P01102095

CURRENT LOGGERS

L101 and L102

■ Bag with transport strap	P01298076
■ USB cable 2 m long, type A to mini-B	Contact us
■ Mains adapter for E3N clamp	P01101965
■ DataView® software	P01102095

L111

■ Standard PVC leads with 4 mm straight male plugs	P01295288Z
■ 32 A crocodile clips	P01102052Z
■ Bag with carrying strap	P01298076
■ USB cable 2 m long, type A to mini-B	Contact us
■ Mains adapter for E3N clamp	P01101965
■ Banana plug/female BNC adapter	P01101846
■ DataView® software	P01102095

ML912

■ Bag with carrying strap	P01298076
■ USB cable 2 m long, type A to mini-B	Contact us
■ DataView® software	P01102095

ML914 et AL 834

■ DataView® software	P01102095
■ Bag no. 23	P01298078

VOLTAGE LOGGERS

L261 and L481

■ Standard PVC leads with 4 mm straight male plugs	P01295288Z
■ 32 A crocodile clips	P01102052Z
■ Bag with carrying strap	P01298076
■ USB cable 2 m long, type A to mini-B 5-pin	Contact us
■ Banana plug/female BNC adapter	P01101846
■ DataView® software	P01102095

PROCESS DATA LOGGER

L452

■ DataView® software	P01102095
■ µUSB power cable	P01102148
■ Wall mount	P01651024
■ MultiFix mounting adapter	P01102100Z
■ Screw connector kit (x 5)	P01295489


TEMPERATURE LOGGER

L642

■ SK6 flexible K thermocouple sensor	P03652906
■ Bag with carrying strap	P01298076
■ USB cable 2 m long, type A to mini-B	Contact us
■ DataView® software	P01102095

FIND ALL OUR ACCESSORIES ON PAGE 230





PHYSICAL & ENVIRONMENTAL MEASUREMENTS

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TEMPERATURE MEASUREMENT

Thermometers have always been essential instruments, used by all industrial companies for:

- Ambient temperature measurement.
- Control of the temperature in a cold room or climatic chamber.
- Temperature measurement on partitions.
- Verification of the hot spots in an electrical cabinet.
- Verification of foodstuff freshness by inserting a probe in the heart of the product

THERMOCOUPLES

The operating principle of thermocouples is based on the **electromotive force created naturally between two conductor wires of different materials joined at the end** (SEEBECK effect). This electromotive force depends on the temperature to which one of the two junctions is exposed. This temperature is measured as a voltage of a few millivolts. A thermocouple is therefore composed of two junctions (or welds) linking two different metals or alloys. One of the junctions, positioned at the point of measurement, is called the hot junction, while the other is called the cold junction and its known temperature serves as the reference. For two given materials or alloys, there is a relation between the electromotive force and the reference and measurement temperatures. This relation is usually **expressed** by a characteristic curve of **sensitivity in mV/°C**.

RESISTIVE PROBES

Some pure metals have a coefficient of resistivity which varies as a function of temperature in a reproducible way. The metals generally used are platinum and copper. Currently, the widest-used type is platinum, with a resistance of 100 Ω at 0 °C.

OPTICAL OR NO-CONTACT MEASUREMENTS

All bodies emit electromagnetic radiation whose spectrum has an energy distribution which is a function of temperature.

This measurement system offers **quick temperature testing on parts which are current-carrying, moving or difficult to access**. It can also be used for measurements of very high temperatures or on poor heat conductors such as ceramics or synthetic materials.

Chauvin Arnoux offers easy-to-use electronic thermometers which are rugged and accurate:

- Thermocouple thermometers.
- Resistive-probe thermometers.
- No-contact thermometers.
- Thermal cameras.

CHOOSING THE RIGHT TEMPERATURE MEASUREMENT SYSTEM

Three types of measurement are used to measure temperature:

- Measurement by penetration (semi-solids, pasty samples, etc.) and by immersion (liquids).
- Ambient measurement (air, gas).
- Surface measurement (solid bodies).

For the latter type, users can choose a system with or without contact, depending on the application involved. The type of application will determine the instrument and the probe chosen.

In general, thermocouples offer quick response times and wide measurement ranges. Sensors with resistive probes are usually slower, but they are also more accurate.

The sensor selection criteria will depend on:

- the milieu and the operating environment.
- the temperature range.
- the required accuracy.
- the response time.





INFRARED THERMOGRAPHY

Infrared thermography detection technology has become irreplaceable for ensuring safe conditions for industrial production. Infrared thermal imaging is a no-contact, real-time inspection method for production equipment subject to high voltages, powerful electric currents or high operating speeds.

For this detection method, there is no need to cut off the current, shut down the machines or stop production. It can be used to troubleshoot any latent malfunctions in advance and thus prevent failures and avoid production incidents.

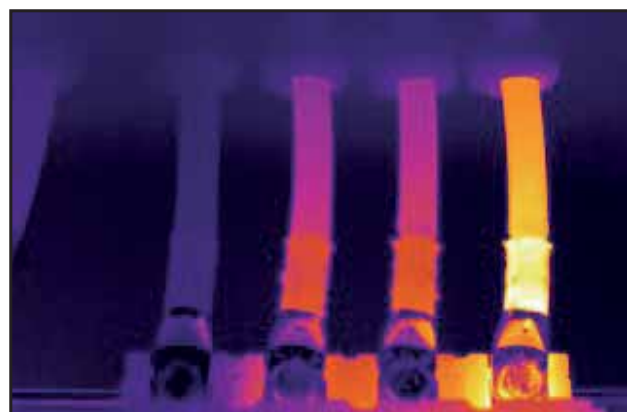
Thermal imaging is an **innovative technique for safe, reliable and quick “no-contact” assessment**.

A thermal camera does not measure temperatures but radiation fluxes. Once the operator has adjusted certain parameters, the camera calculates the temperatures of the target. It then provides the user with a map of the temperatures, called a thermogram: each temperature is represented by a different colour.

ELECTRICAL MAINTENANCE

The purpose of this sort of inspection is to detect any overheating in working electrical systems due to various causes: poor connections, overloads, phase unbalance, faulty contacts, etc. This helps to prevent and avoid costly equipment damage, production shutdowns, operating losses, fires, etc.

The aim is to help with decision-making for corrective action, to prevent incidents, to anticipate any works which might be necessary and to facilitate electrical installation maintenance (time saving and safety).

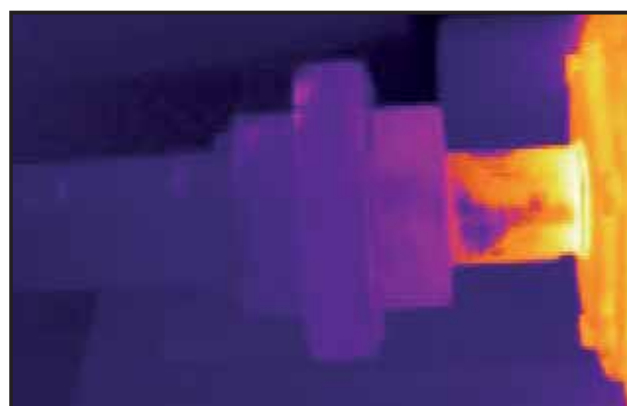


MECHANICAL MAINTENANCE

Moving mechanical parts heat up quite normally due to friction. Infrared thermography reveals abnormal overheating due to wear, misalignment, lubrication problems, etc.

It is used to complement vibratory analysis, which is much more time-consuming to set up.

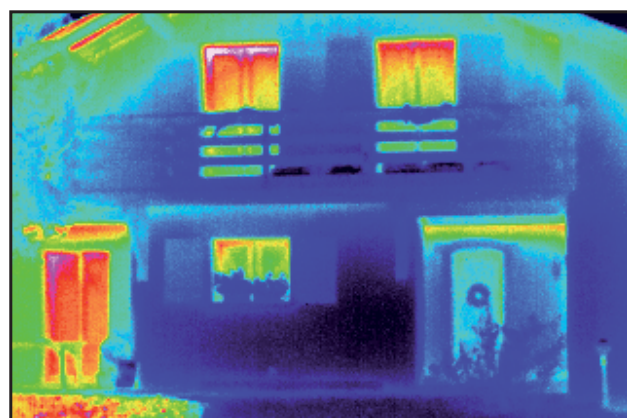
A single image gives a full health report on the electric motor, its power supply (cables), the bearings and, if necessary, the alignment.



BUILDING THERMICS

These applications of infrared thermography concern architects, heating and sanitary installers, heating operators, electricians, property companies, property experts, owners and insurers.

With an infrared camera, it is easy to view the distribution of heat on the front of a building and it is also possible to precisely locate heat losses due to faulty insulation. This helps to produce a thermal survey of the building.





INDOOR AIR QUALITY

Whether in places open to the public (transport, government offices, schools or hospitals), workplaces or private areas, our lifestyles mean we spend most of our time indoors. Human activities and products used in construction, decoration and furniture (paint, floor and wall coverings,

varnishes, etc.) are all sources of contamination emitting substances into the air. The issue of indoor air quality has only been raised recently, but it is a major concern because it affects everyone.

CARBON DIOXIDE (CO₂)

Carbon dioxide is a colourless, odourless gas produced by the combustion of carbon-based materials such as wood, oil, coal and their derivatives. It is also produced by humans' and animals' respiration. Plants, however, actually extract CO₂ from the air during photosynthesis, thus contributing to the natural balance.

Nevertheless, the level of CO₂ in outdoor air is increasing. This gradual increase began with the industrial revolution and the growing use of fossil fuels.

WHY MEASURE IT?

Indoors, CO₂ is representative of a level of confinement indicating an accumulation of pollutants in the premises and insufficient air renewal. Links have been found between poor ventilation, leading to high levels of CO₂, and reduced

performance by children in tests involving logic, reading and calculations.

Concentrations above 1,000 ppm already cause sleepiness, difficulty in concentrating and even headaches.





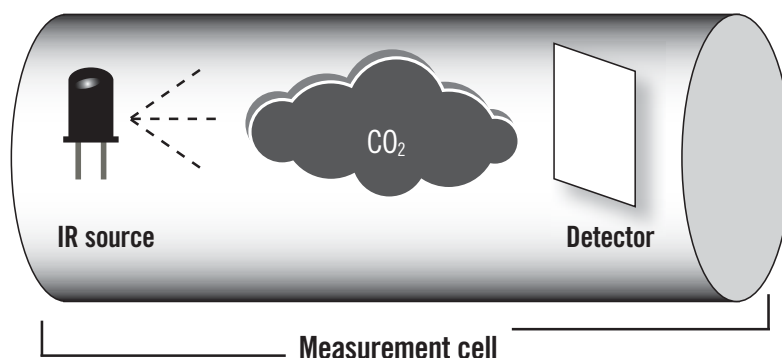
THRESHOLD VALUES

In volume terms, the proportion of CO₂ in the air is 0.0375%, or 375 ppmv (parts per million by volume). In urban environments, it may be as high as 500 ppm.

- 500 to 1,000 ppm - Indoor air quality: Good
- 1,000 ppm - Certain studies have shown an increase in asthma-related symptoms among children on average over a school day
- 1,500 to 2,500 ppm - Indoor air quality: Poor (1,500 ppm is the regulatory limit usually specified, particularly for educational premises in the United Kingdom, Germany and Austria)
- 2,500 to 5,000 ppm - Symptoms: headache, fatigue and loss of concentration
- 5,000 ppm - Average concentration over 8 hours - Occupational Exposure Limit in France and elsewhere

MEASUREMENT PRINCIPLE

The method used by the C.A 1510 to measure CO₂ levels is an NDIR (Non-Dispersive InfraRed) method.



CO₂ and other gases absorb IR radiation in a “specific” way.

- 1 source emits an IR signal in a predefined cavity
- The CO₂ absorbs part of the light in the near-IR spectrum, thus reducing the intensity of the signal
- The IR detector measures the intensity of the signal received at the absorption wavelength of carbon dioxide. The Beer-Lambert Law establishes the relationship between the signal intensity and the gas concentration.

SENSOR POSITIONING AND RECOMMENDATIONS

The measuring instrument should preferably be positioned between 50 cm and 2 m from the ground. In practice, it should be set up in a safe place with access to a power socket if necessary.

The instrument should be kept at least 50 cm away from any intense heat sources (heating) and should be kept out of direct sunlight. The instrument must not be placed in

the direct flow of air from outside (windows) or close to the entrance. The CO₂ level varies during the day, depending on how many people are present, the activities involved and the efficiency of the air renewal system; for these reasons, functions for recording and for indicating any threshold overruns are crucial.



CHOOSE YOUR CALIBRATOR



C.A 1621
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C.A 1623
page 155



C.A 1631
page 156

Measurement / Simulation

J, K, T, E, R, S, B and N thermocouples			
Resistive probes Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000			
4-20 mA			
0-10 V			

Voltage

Up to 100 mV			
Up to 20 V			

Current

Up to 24 mA			
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Resistance

0.00 to 3,200.0			
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C.A 1621 - C.A 1623

Ref.: P01654621

P01654623



STRENGTHS

- Large screen for easier reading
- Instrument calibration without removing the sensors
- Comfortable handling due to its dimensions (205x97x45 mm) and weight (472 g)

C.A 1621: thermocouple-probe temperature calibrator capable of measuring and simulating:

- up to 8 types of thermocouple: J, K, T, E, R, S, B and N
- a voltage in mV

C.A 1623: resistive-probe temperature calibrator capable of measuring and simulating:

- up to 7 types of resistive probes: Pt 10, Pt 50, Pt 100, Pt 200, Pt 500, Pt 1000, Pt 100(JIS)
- a resistance

SPECIFICATIONS

C.A 1621				
Input/output range		Resolution		Accuracy
-10 mV ... 100 mV		0.01 mV		± 0.025 % + 2 counts
Function	Range	Resolution	Accuracy	Ref. junction error
Type J	-200 ... +1,200 °C	0.1°C	± (0.3 °C + 10 µV)	± 0.3 °C
Type K	-200 ... +1,370 °C	0.1°C	± (0.3 °C + 10 µV)	± 0.3 °C
Type T	-200 ... +400 °C	0.1°C	± (0.3 °C + 10 µV)	± 0.3 °C
Type E	-200 ... +950 °C	0.1°C	± (0.3 °C + 10 µV)	± 0.3 °C
Type R	-20 ... +1,750 °C	1°C	± (1 °C + 10 µV)	± 0.3 °C
Type S	-20 ... +1,750 °C	1°C	± (1 °C + 10 µV)	± 0.3 °C
Type B	+600 ... +1,800 °C	1°C	± (1 °C + 10 µV)	± 0.3 °C
Type N	-250 ... +1,300 °C	0.1°C	± (0.3 °C + 10 µV)	± 0.3 °C

ADDITIONAL INFO

- Power supply via optional mains lead:
- Input: 100 V/240 V - 50/60 Hz - 1.8 A
- Output: 12 Vdc, 2 A max
- Battery-powered (6 x 1.5 V supplied) or via mains lead (option)

CONTENTS

- 1 calibrator
- 1 soft case
- 6 x 1.5 V LR06 batteries
- **C.A 1621** delivered with 2 additional thermocouple adapters
- **C.A 1623** delivered with 2 additional test leads and 2 additional crocodile clips

ACCESSORIES / REPLACEMENT PARTS

- Mains power cable P01103057
- MultiFix bag - 120x245x60 mm P01298075
- See all the accessories on page 188

C.A 1623					
Range		4-wire measurement accuracy $\pm \Omega$	Simulation accuracy $\pm \Omega$		Acceptable excitation mA
0.00 Ω ... 400.0 Ω		0.1	0.15		0.1 ... 0.5
			0.1		0.5 ... 3.0
400.0 Ω ... 1,500.0 Ω		0.5	0.5		0.05 ... 0.8
1,500.0 Ω ... 3,200.0 Ω		1	1		0.05 ... 0.4
		2			
Mode	Range	Accuracy in $^{\circ}\text{C}$			Excitation admissible mA
		4-wire input	2-wire / 3-wire input	Output	
Pt10 385	-200 ... +800 $^{\circ}\text{C}$	0.1 ... 3.0			0.1 ... 3.0
Pt50 385	-200 ... +800 $^{\circ}\text{C}$	0.7	1.0	0.7	0.1 ... 3.0
Pt100 385	-200 ... +800 $^{\circ}\text{C}$	0.33	0.5	0.33	0.1 ... 3.0
Pt200 385	-200 ... +250 $^{\circ}\text{C}$	0.2	0.3 1.6	0.2 0.8	0.1 ... 3.0
Pt500 385	+250 ... +630 $^{\circ}\text{C}$	0.8	0.3	0.3 0.4	0.05 ... 3.0
Pt1000 385	-200 ... +500 $^{\circ}\text{C}$	1.6	0.4 0.5	0.2 0.2	0.1 ... 3.0
Pt100 JIS	+500 ... +630 $^{\circ}\text{C}$	0.3	0.5	0.3	0.1 ... 3.0



C.A 1631

Ref. : P01654402

STRENGTHS

Voltage/current process signal calibrator used to measure or supply:

- a 0 - 24 mA DC current loop
- a 0 - 20 V DC voltage

SPECIFICATIONS

C.A 1631		
Calibre	Resolution	Accuracy \pm (% of reading + counts)
100 mV	0.01 mV	0.02 % + 3
20 V	0.001 V	0.02 % + 3

Input impedance: 2 M Ω (rated value), < 100 pF

Protection against overvoltages: 30 V - Current supplied at 20 V: 1 mA

Calibre	Resolution	Accuracy \pm (% of reading + counts)
24 mA	0.001 mA	0.015 % + 3

Protection against overloads: 125 mA 250 V quick-response fuse

Percentage display: 0 % = 4 mA 100 % = 20 mA

Source mode: 1,000 Ω load at 20 mA for a battery voltage \geq 6.8 V (700 Ω at 20 mA for a battery voltage between 5.8 and 6.8 V)

Simulation mode: external loop voltage condition: 24 V (rated value), 30 V maximum, 12 V minimum.

Loop voltage power supply: 24 V \pm 10 %

ADDITIONAL INFO

- Power supply via optional mains lead:
- Input: 100 V/240 V - 50/60 Hz - 1.8 A
- Output: 12 Vdc, 2 A max
- Powered by batteries (6 x 1.5 V supplied) or via mains lead (option)

CONTENTS

- 1 calibrator
- 1 soft case
- 6 x 1.5 V LR06 batteries
- 2 test leads
- 2 crocodile clips
- 2 test probes

ACCESSORIES / REPLACEMENT PARTS

- Mains power cable P01103057
- MultiFix bag - 120x245x60 mm P01298075
- See all the accessories on page 188

PHYSICAL & ENVIRONMENTAL MEASUREMENTS

CHOOSE YOUR THERMAL CAMERA



C.A 1950
page 158



C.A 1882
page 160



C.A 1886
page 161



C.A 1888
page 162

Detectors				
80 x 80	<input checked="" type="checkbox"/>			
160 x 120		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
384 x 288				<input checked="" type="checkbox"/>
Thermal sensitivity (N.E.T.D)				
0.08°C @ 30°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
0.05°C @ 30°C				<input checked="" type="checkbox"/>
Temperature range				
-20°C to +250°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
-20°C to +600°C			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1,000°C / 1,500°C (option)			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Display mode				
Thermal image	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Real image and merge	Merge via software	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Display	2.8 inches	3 inches	3.5 inches	3.5 inches
Analysis functions				
Manual cursor	1	1	3	3
Min / Max on area	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Average on area			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Isotherm	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature profile	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature differential		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarms			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Correction parameters				
Emissivity, environmental temp., relative humidity, distance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Others				
CNPP Approval			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wide-angle or telephoto lenses available as options			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Analysis and report creation software	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



THERMAL CAMERAS

C.A 1950

Ref. : P01651901



STRENGTHS

- 13-hour battery life and startup in only 3 seconds
- Withstands falls of up to 2 m without interrupting operation
- Focus-free with 20° x 20° field of view
- Voice annotation for recording your comments directly on the image (earphone supplied)
- Connectivity with current clamps and multimeters

ADDITIONAL INFO

- Recording of thermal image and real image simultaneously. Image merge function available via the CAMReport software supplied
- Large number of measurement tools: manual cursor, automatic detection, temperature profile, etc.
- Built-in brightness sensor

CONTENTS

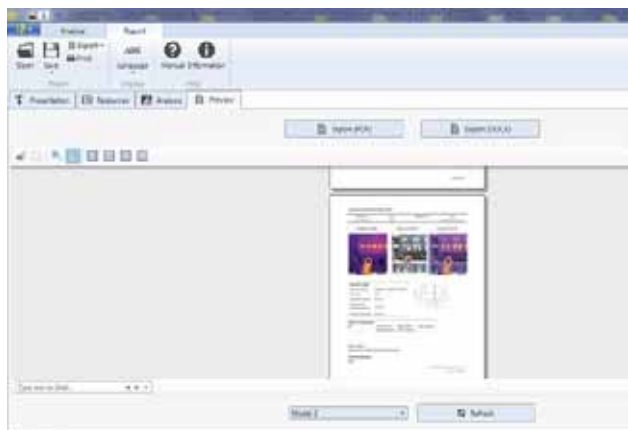
- C.A 1950 delivered in site-proof hard case with:
- 4 x NiMH batteries
- 1 battery charger
- 1 x 2 GB micro SD HD card
- 1 USB cable
- 1 Bluetooth® earphone
- 1 CD-ROM containing the CAMReport software
- 1 measurement report

SPECIFICATIONS

C.A 1950	
Detector	80 x 80
Type	UFPA microbolometer, 8 ~14 µm
Frequency	9 Hz
Sensitivity (N.E.T.D)	80 mK @ 30 °C (0.08 °C @ 30 °C)
Temperature measurement	
Temperature range	-20 °C to +250 °C
Accuracy	±2 °C or ±2 % of reading
Imaging performance (thermal image)	
Field of view	20° x 20°
IFOV (spatial resolution)	4.4 mrad
Focus	Fixed
Minimum focal distance	40 cm
Real image	Yes (320 x 240 pixels)
Display mode	Thermal image, real image with automatic parallax compensation. Image merge available with PC software
Analysis functions	
Measurement tools	1 manual cursor + 1 automatic detection + Min Max on adjustable area + Temperature profile + Isotherm
Parameter settings	Emissivity, environmental temperature, distance, relative humidity
Voice comments	Yes by Bluetooth® (earphone supplied)
Connectivity	F407, F607, MTX 3292 and MTX 3293 clamps
Data storage	On 2 GB removable micro SD card (approx. 4,000 images), up to 32 GB
Image format	.bmp (thermal and real images recorded simultaneously)
Image presentation	
Adjustment	Automatic or manual adjustment of palette min/max
Image hold	Animated or fixed image
Image display	Multi-palette
Screen	2.8 inches
Power supply	
Type	Rechargeable NiMH batteries with low self-discharge
Recharging	External (charger supplied)
Battery life	13 hrs 30 min (typical) / 50 % brightness, Bluetooth® off
Environmental specifications	
Operating temperature	-15 °C to +50 °C (-4 °F to +122 °F)
Storage temperature range	-40 °C to +70 °C (-40 °F to +158 °F)
Humidity	10 % to 95 %
Compliance with standards	EN 61326-1 : 2006 / EN 61010-1 Ed. 2
Fall resistance	2 metres on all surfaces
Shock resistance	25 G
Vibration resistance	2 G
Physical specifications	
Weight /dimensions	700 g with rechargeable batteries / 225 x 125 x 83
Ingress protection	IP 54
Interfaces	- USB link and Mass Storage: the product is then recognized as a USB key for easy image transfer - Bluetooth for connectivity with earphone (voice comments) and Chauvin Arnoux® Metrix® measuring instruments (F407, F607, MTX 3292, MTX 3293)
Tripod mounting	Yes, 1/4" insert on camera
General specifications	
Report creation software	Supplied as standard with automatic report generation in .pdf or .docx (Word) format / Compatible with W7, W8, 32 and 64 Bits
Warranty	2 years



CAmReport



STRENGTHS

- Dedicated to the C.A 1950 thermal camera
- Supplied as standard at no additional cost
- Complete, with all the functions needed for reliable analysis of the measurement results
- Automatic creation of analytical reports which can be exported in Word or pdf format.

REQUIRED CONFIGURATION

WINDOWS XP :

- SP3 minimum
- 850 MB RAM for 32 bit
- 2 GB for 64 bit
- NET Framework 4.0 minimum
- Monitor resolution: super VGA (800 x 600) or higher

WINDOWS VISTA / 7 / 8 / 10 :

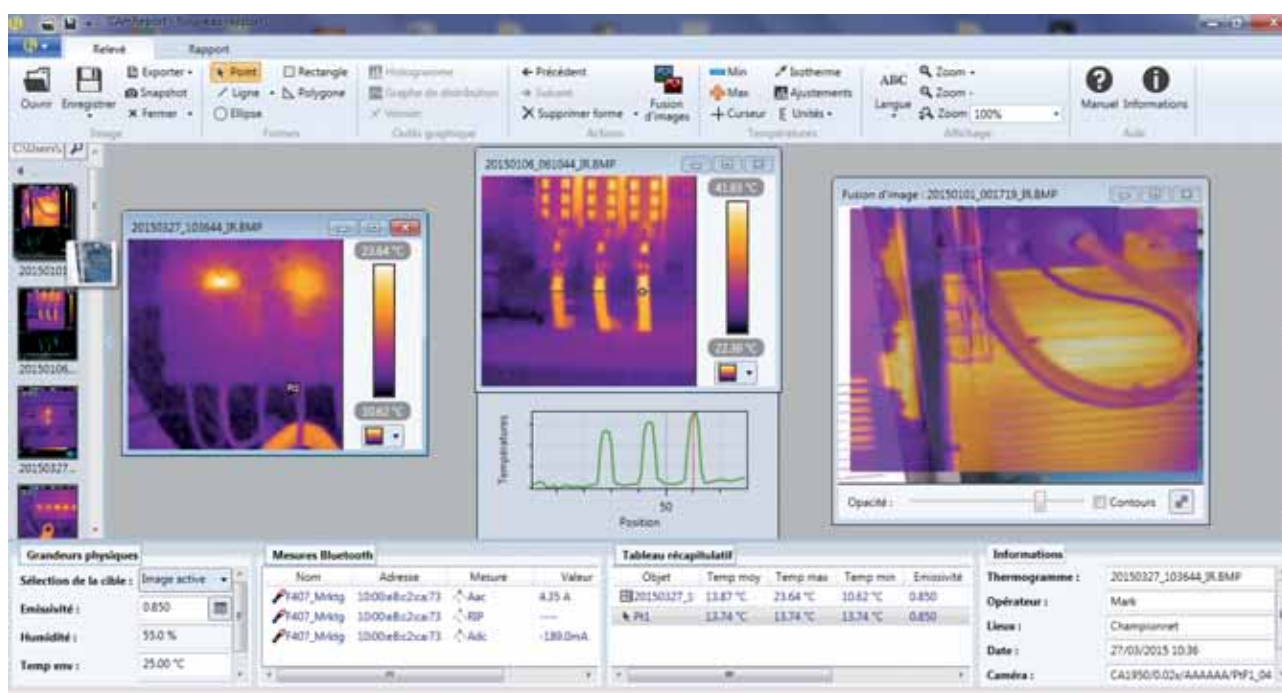
- SP1 minimum
- 850 MB RAM for 32 bit
- 2 GB for 64 bit
- NET Framework 4.0 minimum

PRECISE ANALYSIS TOOLS

- Cursors (automatic display of the temperature at the selected point)
- Thermal profile (automatic display of the Min/Max/Avg temperatures of the line)
- A square or circle for area analysis
- Polygons and polylines for more precise analysis of certain areas in the thermogram
- Results tables quickly and automatically display all the information
- Recovery of the voice comments or related measurements
- Automatic merging of the thermal and real images recorded simultaneously
- Automatic report creation for export in .pdf or .docx format

AVAILABLE LANGUAGES

- French, English, German, Spanish, Italian , Dutch, Polish, Romanian, Czech, simplified Chinese, Portuguese, Swedish, Finnish



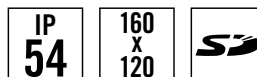


THERMAL CAMERAS



C.A 1882

Ref. : P01651215



STRENGTHS

- Wide-angle lens
- MixVision cursor for linking a thermogram to a real image
- Manual cursor and automatic detection of hot/cold points
- Wide dynamic range for measurement: -20 °C to +250 °C
- Recording of up to 1,000 thermograms on 2 GB SD card

SPECIFICATIONS

C.A 1882	
Detector	160 x 120
Type	UFPA microbolometer, 8-14 µm
Frequency	50 Hz*
Sensitivity (N.E.T.D)	0.08 °C @ 30 °C
Temperature measurement	
Temperature range	-20 °C to +250 °C
Accuracy	±2 °C or ±2% of reading
Image performance	
Thermal image	
Field of view	38° x 28°
Spatial resolution	4.4 mrad
Min. focal distance.	10 cm
Focus	Manual
Real image	Yes
"MixVision" mode	Merge function with adjustment of percentage of thermal image in real image from 0 to 100%
Image size	640 x 480 pixels
Functions	
Parameter settings	Emissivity, environmental temperature, distance, relative humidity
Measurement tools	1 manual cursor + 1 automatic Min/Max detection on adjustable area
Laser pointer	Yes
Data storage	1,000 thermal images as standard
Type of storage	2 GB removable SD card (as standard), up to 16 GB
Multi-directional screen	3 inches
General specifications	
Battery	Rechargeable Lithium-Ion battery / Batt. life: 3 hours
Battery recharging	Recharging via external charger
Protection	IP54

*9 Hz outside the European Union

ADDITIONAL INFO

- The C.A 1882 camera is delivered as standard with its docking station equipped with a video output
- An SD card reader is supplied with the camera
- The screen is totally multi-directional so that it can be used whatever the environment
- A 9 Hz version is available with the reference P01651215E

CONTENTS

- C.A 1882
- 1 neutral box
- 1 battery charger
- 1 docking station
- 1 battery
- 1 x 2 GB SD card
- 1 SD card reader
- 1 video cable
- 1 CD-ROM containing the RayCam Report software

ACCESSORIES / REPLACEMENT PARTS

- Battery P01296045
- Battery charger P01296046
- See all the accessories on page 188



C.A 1886

Ref. : P01651260

 IP
54

 160
x
120


STRENGTHS

- 160 x 120 matrix
- Sensitivity: 0.08 °C at 30 °C
- Temperature up to 600 °C as standard
- Large, multi-directional 3.5" screen for easier reading
- MixVision function which links a thermogram to a real image

SPECIFICATIONS

C.A 1886	
Detector	160 x 120, refresh rate: 50 Hz
Type	UFPA microbolometer, 8-14 microns
Sensitivity (NETD)	0.08 °C @ 30 °C
Temperature	-20 °C to +600 °C as standard Up to 1,500 °C as an option
Accuracy	±2 °C or ±2 %
Optics	Field of view: 20° x 15°, IFOV: 2.2 mrad Min. focal distance: 10 cm
"MixVision" mode	Merge function with adjustment of percentage of thermal image in real image from 0 to 100%
Image size	640 x 480 pixels
Adjustment	Emissivity, environmental temperature, distance, humidity
Measurement tools	3 manual cursors + 1 auto. Max/Min/Avg detection on area, isotherm, temperature differential, temperature profile
Data storage	1,000 images (radiometric format) in 250 folders + 2 GB on mini-SD card
Power supply	Battery life: 3 hrs (continuous use) Recharging via external charger

CONTENTS

- C.A 1886 delivered in a case with:
- 1 battery charger
- 2 batteries
- 1 x 2 GB mini SD card
- 1 SD card reader
- 1 video cable
- 1 CD-ROM containing the RayCam Report software
- 1 measurement report

ADDITIONAL INFO

The C.A 1886 thermal camera is available in other configurations:

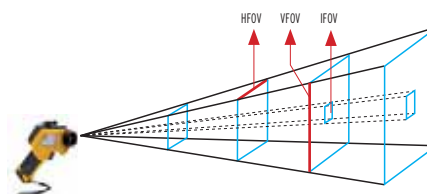
- C.A 1886 with 1,000 °C high-temperature option P01651261
- C.A 1886 with 1,500 °C high-temperature option P01651262
- C.A 1886 Bluetooth P01651263
- RayCam Report software supplied for area analysis (polygons or polylines) and studying the temperature distribution on a histogram

ACCESSORIES / REPLACEMENT PARTS

- Sun shade P01651531
- Photo tripod adapter P01651526
- See all the accessories on page 188

LENSES FOR C.A 1886

Lenses	IFOV spatial resolution		0.1 m	0.3 m	0.5 m	1 m	2 m	10 m	30 m	100 m
6.4° x 4.8° 3 x telephoto lenses	0.7 mrad	HFOV	0.01	0.03	0.05	0.11	0.22	1.11	3.35	11.18
		VFOV	0.008	0.024	0.04	0.08	0.16	0.83	2.51	8.38
		IFOV	0.07	0.21	0.34	0.69	1.39	6.98	20.96	69.88
20° x 15° standard lens	2.2 mrad	HFOV	0.03	0.10	0.17	0.35	0.70	3.52	10.57	35.26
		VFOV	0.02	0.07	0.13	0.26	0.52	2.63	7.89	26.33
		IFOV	0.22	0.66	1.10	2.20	4.40	22.04	66.12	220.40
38° x 28.5° 0.5 x wide-angle lens	4.4 mrad	HFOV	0.06	0.20	0.34	0.68	1.37	6.88	20.65	68.86
		VFOV	0.05	0.15	0.25	0.50	1.01	5.07	15.23	50.79
		IFOV	0.43	1.29	2.15	4.30	8.60	43.04	129.12	430.40


HFOV : (metres)
Horizontal field of view

VFOV : (metres)
Vertical field of view

IFOV : Spatial resolution



THERMAL CAMERAS



C.A 1888

Ref. : P01651270

IP
54

384
X
288



STRENGTHS

- 384 x 288 matrix
- Sensitivity: 0.05 °C @ 30 °C
- Temperature up to 600 °C as standard
- Large multi-directional 3.5" screen for easier reading
- MixVision which links a thermogram to a real image

SPECIFICATIONS

C.A 1888	
Detector	384 x 288, refresh rate: 50 Hz
Type	UFPA microbolometer, 8-14 microns
Sensitivity (NETD)	0.05 °C @ 30 °C
Temperature	-20 °C to +600 °C as standard Up to 1,500 °C as an option
Accuracy	±2 °C or ±2 %
Optics	Field of view: 24° x 18°, IFOV: 101 mrad Min. focal distance: 10 cm
"MixVision" mode	Merge function with adjustment of percentage of thermal image in real image from 0 to 100%
Image size	640 x 480 pixels
Adjustment	Emissivity, environmental temperature, distance, humidity
Measurement tools	3 manual cursors + 1 auto. Max/Min/Avg detection on area, isotherm, temperature differential, temperature profile
Mémoire Data storage	1,000 images (radiometric format) in 250 folders + 2 GB on mini-SD card
Power supply	Battery life: 3 hrs (continuous use) Recharging via external charger

CONTENTS

- C.A 1888 delivered in a case with:
 - 1 battery charger
 - 2 batteries
 - 1 x 2 GB mini SD card
 - 1 SD card reader
 - 1 video cable
 - 1 CD-ROM containing the RayCam Report software
 - 1 measurement report

ACCESSORIES / REPLACEMENT PARTS

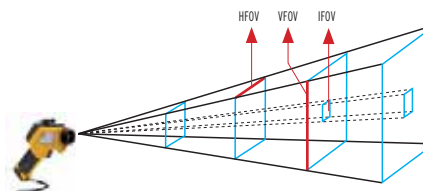
- Sun shade P01651531
- Photo tripod adapter P01651526
- See all the accessories on page 188

LENSES FOR C.A 1888

Lens	IFOV spatial resolution		0.1 m	0.3 m	0.5 m	1 m	2 m	6 m	10 m	30 m	100 m
12°x 9° Telephoto lens	0.55 mrad	HFOV	0.02	0.06	0.11	0.21	0.42	1.27	2.11	6.34	21.12
		VFOV	0.02	0.05	0.08	0.16	0.32	0.95	1.58	4.75	15.84
		IFOV	0.055	0.17	0.28	0.55	1.10	3.30	5.50	16.50	55.00
24°x 18° Standard lens	1.1 mrad	HFOV	0.05	0.15	0.25	0.50	1.00	3.00	4.99	14.98	49.92
		VFOV	0.04	0.11	0.19	0.37	0.75	2.25	3.74	11.23	37.44
		IFOV	0.13	0.39	0.65	1.30	2.60	7.80	13.00	39.00	130.00
48°x 36° Wide-angle lens	2.2 mrad	HFOV	0.08	0.253	0.42	0.84	1.69	5.07	8.45	25.34	84.48
		VFOV	0.06	0.190	0.32	0.63	1.27	3.80	6.34	19.01	63.36
		IFOV	0.22	0.660	1.10	2.20	4.40	13.20	22.00	66.00	220.00

ADDITIONAL INFO

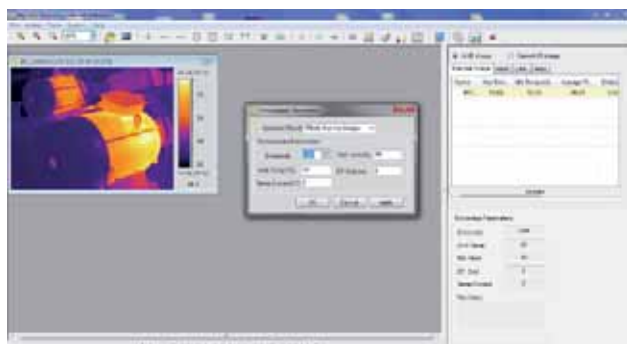
- The C.A 1888 thermal camera is also available in other configurations:
 - C.A 1888 with 1,000 °C high-temperature option P01651271
 - C.A 1888 with 1,500 °C high-temperature option P01651272
 - C.A 1888 Bluetooth P01651273
- RayCam Report software supplied for area analysis (polygons or polylines) and studying the temperature distribution on a histogram



HFOV : (metres)
Horizontal field of view

VFOV : (metres)
Vertical field of view

IFOV : Spatial resolution



RayCam Report



C.A 1882
C.A 1886
C.A 1888



STRENGTHS

- Specially developed for the C.A 1882, C.A 1886 and C.A 1888 thermal cameras
- Supplied as standard at no additional cost
- Complete, with all the functions needed for reliable analysis of the measurement results
- Creation of analysis reports exportable in Word or PDF format
- Very simple user interface

REQUIRED CONFIGURATION

WINDOWS XP :

- SP2 minimum
- 512 MB RAM minimum
- CPU 700 Hz minimum
- .NET Framework 2.0 minimum
- Monitor resolution: 1,024 x 768 minimum

WINDOWS VISTA / 7 / 8 / 10 :

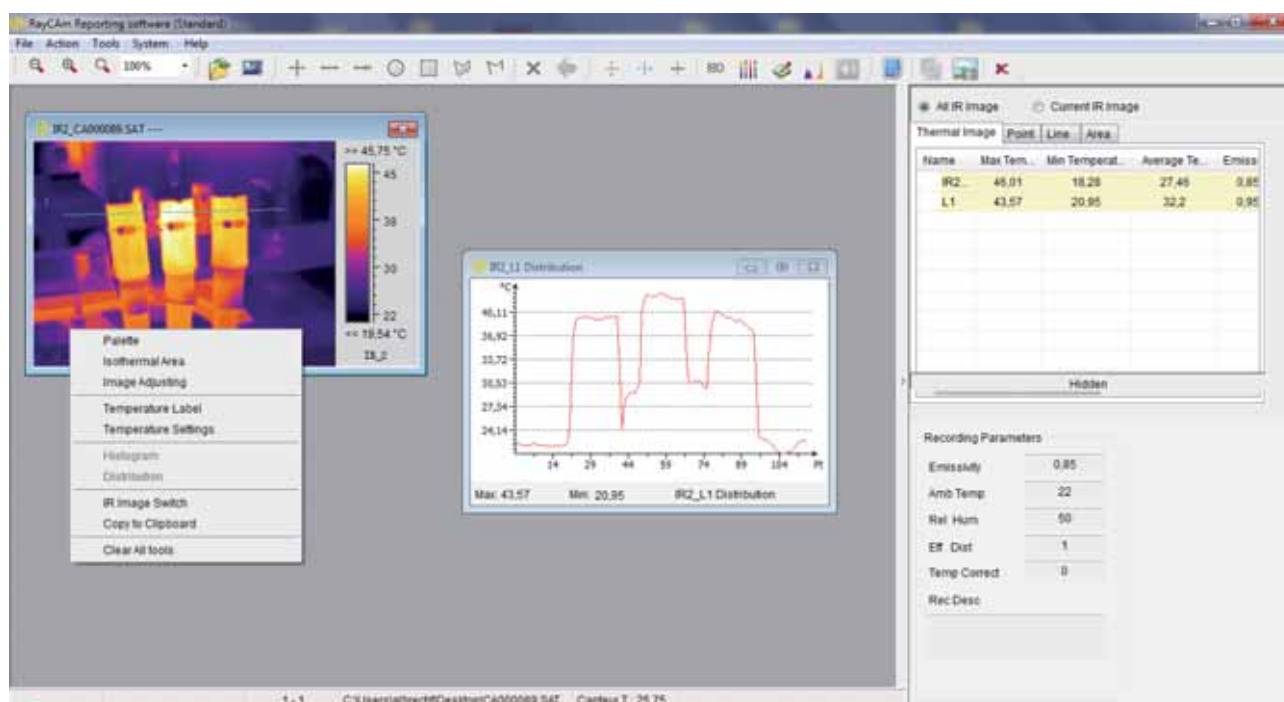
- SP1 minimum
- 1 GB RAM minimum
- CPU 1 GHz minimum
- .NET Framework 2.0 minimum
- Monitor resolution: 1,024 x 768 minimum

AVAILABLE LANGUAGES

- French, English, German, Spanish, Italian.

PRECISE ANALYSIS TOOLS

- Cursors (automatic display of the temperature at the selected point)
- Thermal profile (automatic display of the Min/Max/Avg temperatures of the line)
- A square or circle for area analysis
- Polygons and polylines for more precise analysis of certain areas in the thermogram
- Results tables quickly and automatically display all the information
- The "Max" function automatically indicates the hot point in the whole thermogram or in a predefined area for analysis
- A histogram for studying the temperature distribution according to several intervals
- Display of a value label next to the measurement tool
- Assignment of a different emissivity from that of the rest of the thermogram
- Automatic merging of the thermal and real images recorded simultaneously
- Automatic report creation for export in .pdf or .docx format





CHOOSE YOUR THERMOMETER



C.A. 1871

C.A. 871

C.A. 879

C.A. 1864

C.A. 1866

C.A. 876

C.A. 1821

C.A. 1822

C.A. 1823

TK 2000

TK 2002

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Measurement by infrared

	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
--	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	--	--	--	--	--

Field of view

8/1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
10/1						<input checked="" type="checkbox"/>					
12/1			<input checked="" type="checkbox"/>								
30/1				<input checked="" type="checkbox"/>							
50/1					<input checked="" type="checkbox"/>						

Emissivity

Fixed: 0.95	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
Variable: 0.1 to 1				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Laser sighting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					

Contact measurement

K sensor - 1 input						<input checked="" type="checkbox"/>	J, K, T, N, E, R, S	J, K, T, N, E, R, S		K	K
K sensor - 2 inputs								J, K, T, N, E, R, S			K
Pt100 sensor									Pt100 Pt1000		

General functions

HOLD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Max				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Min				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Avg				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		via Data Logger Transfer	via Data Logger Transfer	via Data Logger Transfer		
Alarm				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Choice of units	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Backlighting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		



C.A 871 - C.A 879

Ref. : P01651302Z

P01651805Z

°C

°F

IR

STRENGTHS

- Small and easy to handle
- Simple to use
- Ideal for everyone
- Ergonomics specially designed for comfortable handling
- Laser sighting for precise targeting of measuring area

SPECIFICATIONS

	C.A 871	C.A 879
Field of view	8/1	12/1
Emissivity	Fixed: 0.95	
Measurement range	-40 °C to +538 °C	-50 °C to +550 °C
Resolution	0.1 °C up to 100 °C 1 °C for > 100 °C	
Accuracy*	±2.5% ±2 °C	±1.5% ±2 °C
Functions		
Laser sighting	Yes	
Continuous measurement	Yes (continuous press on trigger)	
Hold	Yes	
Measurement unit	°C / °F	
Display	2,000 counts, backlighting	
Dimensions / weight	160 x 82 x 41.5 mm	230 x 100 x 56 mm
	180 g	290 g

*Depending on temperature measurement range. See User Manual for further details.

ACCESSORIES / REPLACEMENT PARTS

- 9 V LR14 battery P01100620
- Soft case P01298033

CONTENTS

- C.A 871 and C.A 879 delivered with:
 - 1 bag
 - 1 x 9 V LR14 battery



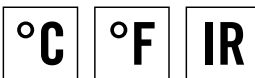
NO-CONTACT THERMOMETERS



C.A 1864 - C.A 1866

Ref. : P01651813

P01651814



STRENGTHS

- Extended temperature range: measure up to 1,000 °C
- Use the variable emissivity to perform your inspections in accordance with reality
- High distance/spot ratio for better accuracy at long distances
- Set your alarm thresholds so that you are alerted every time there is an abnormal temperature!

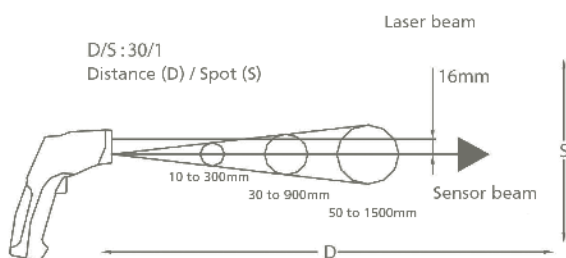
SPECIFICATIONS

	C.A 1864	C.A 1866
Distance/spot ratio	30/1	50/1
Emissivity	0.1 to 1	
Measurement range	- 50 °C to +1,000 °C	
Resolution	0.1 °C	
Accuracy	- 50 °C to - 20 °C: ± 5 °C - 20 °C to +200 °C: ± 1.5 % R + 2 °C +200 °C to +538 °C: ± 2.0 % R + 2 °C +538 °C to +1,000 °C: ± 3.5 % R ± 5 °C	
Functions	Max., Min., Avg., DIFF, HOLD	
Alarms	High and Low	
Measurement unit	°C, °F	
Laser sighting	Yes, Class II laser	
Display	20,000 counts, backlighting	
Dimensions / weight	230 x 100 x 56 mm / 290 g	

Distance / Spot ratio: explanatory diagram

C.A 1864

D/S : 30/1
Distance (D) / Spot (S)



ACCESSORIES / REPLACEMENT PARTS

- 9 V LR14 battery P01100620
- Soft case P01298033

CONTENTS

- C.A 1864 and C.A 1866 delivered with:
- 1 bag
- 1 x 9 V LR14 battery



C.A 1871

Ref. : P01651610Z

°C

IR

STRENGTHS

- Infrared probe suitable for use with all multimeters
- Point the probe at the surface of the object. The sensor supplies a voltage proportional to the temperature measured (1 mV / °C)

SPECIFICATIONS

	C.A 1871
Distance/Spot ratio	8/1
Emissivity	Fixed 0.95
Measurement range	- 30 °C to + 550 °C
Accuracy	± 2 % of reading
Dimensions / weight	164 x 50 x 40 mm / 182 g

CONTENTS

- C.A 1871 delivered with:
- 1 x 9V LR14 battery



CONTACT THERMOMETERS



C.A 876

Ref. : P01651403Z

°C

°F

IR

STRENGTHS

- Rugged thanks to their shockproof protective sheath
- Temperature measurement up to 1,350 °C
- Measurement accuracy
- Stability of the sensor over time
- Infrared measurement possible with the C.A 876

SPECIFICATIONS

	C.A 876	
	IR measurement	Contact measurement
Distance/Spot ratio	10/1	-
Emissivity	0.1 to 1	-
Measurement range	- 20 °C to + 550 °C	- 40 °C to + 1350 °C
Accuracy	± 2 % R or ± 3 °C	± 0.1 % R +1 °C
Functions	Max., Min., Avg., HOLD, Alarms	
Dimensions / weight	173 x 60.5 x 38 mm / 255 g	

CONTENTS

- 1 shockproof sheath
- 1 flexible K-thermocouple sensor

ACCESSORIES / REPLACEMENT PARTS

- K thermocouples page 180
- CK extensions page 180



TK 2000 - TK 2002

Ref. : P01653100

P01653110

IP
65

°C

STRENGTHS

- Compact, accurate and simple to use: connect the sensor and start measuring!
- Usable in all environments thanks to their IP 65 protection
- Measures the temperature difference by means of the 2 thermocouple inputs on the TK 2002

SPECIFICATIONS

	TK 2000	TK 2002
No. of inputs	1	2
Range	- 50 °C to +1,000 °C	
Accuracy	± 1.5 % + 0.5 °C	
Functions	HOLD, °C	
Dimensions	163 x 63 x 37.5 mm	
Weight	200 g	

CONTENTS

- 1 battery
- TK 2000 delivered with:
 - 1 flexible K-thermocouple sensor
 - 1 x 9 V 6LR61 battery
- TK 2002 delivered with:
 - 2 flexible K-thermocouple sensors
 - 1 x 9 V 6LR61 battery

ACCESSORIES / REPLACEMENT PARTS

- K-thermocouples page 180
- CK extensions page 180



CONTACT THERMOMETERS



C.A 1821 - C.A 1822

Ref. : P01654821

P01654822



STRENGTHS

- J, K, T, N, E, R, S thermocouples
- Recording of up to 1 million points
- Magnetized product compatible with MultiFix
- USB and Bluetooth communication
- Backlit digital display

SPECIFICATIONS

	C.A 1821	C.A 1822
Sensor	Thermocouple J, K, T, N, E, R, S	
No. of inputs	1	2
Measurement range	J: 210 to + 1,200 °C / 346 to + 2,192 °F K: 200 to + 1,372 °C / 328 to + 2,501 °F T: 250 to + 400 °C / 418 to + 752 °F N: 200 to + 1,300 °C / 328 to + 2,372 °F E: 150 to + 950 °C / 238 to + 1,742 °F R 0 to + 1,767 °C / 32 to + 3,212 °F S 0 to + 1,767 °C / 32 to + 3,212 °F	
Resolution	Display in °C: $\varnothing < 1,000$ °C: 0.1 °C and $\varnothing \geq 1,000$ °C: 1 °C Display in °F: $\varnothing < 1,000$ °F: 0.1 °F and $\varnothing \geq 1,000$ °F: 1 °F	
Accuracy	(J, K, T, N, E) $\varnothing \leq -100$ °C $\pm (0.2\% \text{ Reading} + 0.6$ °C) -100 °C $< \varnothing \leq +100$ °C $\pm (0.15\% R + 0.6$ °C) $+100$ °C $< \varnothing \pm (0.1\% R + 0.6$ °C) (R, S) $\varnothing \leq +100$ °C $\pm (0.15\% R + 1.0$ °C) $+100$ °C $< \varnothing \pm (0.1\% R + 1.0$ °C)	
Functions	Min., Max., HOLD, alarms, temperature differential (C.A 1822)	
Recording	Manual Start / Stop on the product Programmed recording	
Alarms	Visual alert on threshold overrun set via Data Logger Transfer Recording can be triggered on alarm threshold	
Data storage	More than one million points	
Power supply	3 x 1.5V LR6 alkaline batteries or NiMH rechargeable battery Mains connection possible with the mains / micro USB adapter (option)	
Battery life	1,000 hrs (portable mode) 3 years for recording (15-minute measurement interval)	
Dimensions/weight	150 x 72 x 32 mm / 260 g with batteries	
Ingress protection	IP54 casing	
Operating temperature/humidity	-10 to +60 °C / 10 to 90 % RH	
Standards	IEC61010-1 / IEC 61326-1	

ADDITIONAL INFO

- Shockproof sheath available as an accessory
- Compatible with the Data Logger Transfer module of the Dataview® software for:
 - data display
 - programming of recordings
 - automatic export of the report

CONTENTS

C.A 1821 and C.A 1822 delivered with:

- 1 bag
- 3 x 1.5 V LR6 batteries
- 1 USB cable
- 1 measurement report

ACCESSORIES / REPLACEMENT PARTS

- Thermocouple _____ Page 188
- Shockproof sheath + MultiFix accessory _____ P01654252
- CK extensions _____ page 188
- See all the accessories on page 188



C.A 1823

Ref. : P01654823



STRENGTHS

- Pt100 or Pt1000 resistance probe
- Recording of up to 1 million points
- MultiFix-compatible magnetized product
- USB and Bluetooth communication
- Backlit digital display

SPECIFICATIONS

	C.A 1823
Sensor	Pt100 or Pt1000 probe
No. of inputs	1
Measurement range	- 100 to + 400°C -148 to + 752°F
Resolution	Display in °C: 0.1 °C Display in °F: 0.1 °F
Accuracy	± (0.4% R + 0.3°C)
Functions	Min., Max., HOLD, alarms
Recording	Manual Start / Stop on the product Programmed recording
Alarms	Visual alert on threshold overrun set via Data Logger Transfer Recording can be triggered on alarm threshold
Data storage	More than one million points
Power supply	3 x 1.5V LR6 alkaline batteries or NiMH rechargeable battery Mains connection possible with the mains / micro USB adapter (option)
Battery life	800 hrs (portable mode) 3 years for recording (15-minute measurement interval)
Dimensions / weight	150 x 72 x 32 mm / 260 g with batteries
Ingress protection	IP54 casing
Operating temperature/humidity	-10 to +60 °C / 10 to 90 % RH
Standards	IEC61010-1 for 50 V voltages in category II / IEC 61326-1

ADDITIONAL INFO

- Shockproof sheath available as an accessory
- Compatible with the Data Logger Transfer module of the Dataview® software for:
 - data display
 - programming of recordings
 - automatic export of the report

CONTENTS

C.A 1823 delivered with:

- 1 bag
- 3 x 1.5 V LR6 batteries
- 1 USB cable
- 1 measurement report

ACCESSORIES / REPLACEMENT PARTS

- Thermocouple assembly Page 188
- Shockproof sheath + MultiFix accessory P01654252
- CK extensions page 188
- See all the accessories on page 188



CHOOSE YOUR INSTRUMENT FOR PHYSICAL MEASUREMENTS



C.A 847

page 175



C.A 1246

page 174



C.A 1227

page 176



C.A 850

page 178



C.A 852

page 178



C.A 895

page 185



C.A 1510

page 184



C.A 1052

page 177

Temperature measurement

CMOS		■					■	
Pt 100 sensor								■
CTN			■					
2-input K sensor								■

Relative humidity measurement

RH air		■					■	■
Dew point measurement		■						■
RH material	■							

Air-speed measurement

Rotating-vane sensor			■					■
Hot-wire sensor								■
Flow-rate measurement			■					■

Air-pressure measurement

Differential pressure				■	■			■
High pressure (>= 10 bars)				■				
Low pressure (>= 100 mbar)					■			■

Gas measurement

CO gas measurement						■		
CO ₂ gas measurement							■	

General functions

HOLD		■	■	■	■	■	■	■
Max		■	■	■	■	■	■	■
Min		■	■	■	■		■	■
Avg		Via Data Logger Transfer	■					■
Choice of units		■	■	■	■		■	■
Backlighting		■	■	■	■	■	■	■
Alarm		■				■	■	
Recording		■	■				■	■
Software		■	■				■	■

CHOOSE YOUR INSTRUMENT FOR PHYSICAL MEASUREMENTS



C.A 1110

page 179



C.A 832

page 180



C.A 834

page 181



C.A 1725

page 182



C.A 1727

page 182

Lighting measurement					
< 200,000 lux	<input checked="" type="checkbox"/>				
Spectral correction	<input checked="" type="checkbox"/>				
Incidence correction	<input checked="" type="checkbox"/>				
Noise measurement					
A and C frequency weighting		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Slow/fast time weighting		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Analogue output		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Speed measurement					
With and without contact				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rotation speed				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Linear speed				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Frequency, period				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Duty cycle				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metering					<input checked="" type="checkbox"/>
General functions					
HOLD	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Max	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Min	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Avg	<input checked="" type="checkbox"/>				
Choice of units	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Backlighting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Alarm					<input checked="" type="checkbox"/>
Recording	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Software	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>



THERMO-HYGROMETERS



ADDITIONAL INFO

- Compatible with the Data Logger Transfer module of the Dataview® software for:
 - data display
 - programming of recordings
 - automatic export of the report

C.A 1246

Ref. : P01654246



STRENGTHS

- Hygrometry, temperature and dew point
- Recording up to 1 million points
- Visual alarm on threshold overrun
- MultiFix-compatible magnetized product
- Recording trigger on alarm threshold

SPECIFICATIONS

	C.A 1246
RH range	3.0 to 98.0 %RH
RH accuracy	10 to 90 %RH: $\pm (2 \%RH \pm 1 \text{ ct})$, outside that range: $\pm (4 \%RH \pm 1 \text{ ct})$
Temp. range °C/°F	- 10.0 to + 60.0°C +14.0 to + 140.0°F
Temp. accuracy °C/°F	10 to 40°C: $\pm (0.5^\circ\text{C} \pm 1 \text{ ct})$ outside that range: $\pm (0.032 \times (T-25) \pm 1 \text{ ct}) / T =$ temperature in °C
Dew point range	- 20.0 to + 60.0°Ctd -4.0 to + 140.0 °Ftd
Dew point accuracy	1.5 °C from 20 % RH to 30 % RH 1 °C above 30 % RH
Functions	Min., Max., HOLD, alarms
Recording	Manual Start / Stop on the product Programmed recording
Alarms	Visual alert on threshold overrun set via Data Logger Transfer Recording can be triggered on alarm threshold
Data storage	More than 1 million points
Power supply	3 x 1.5V AA / LR6 alkaline batteries or NiMH rechargeable battery Mains connection possible with the mains / micro USB adapter (option)
Battery life	1,000 hrs (portable mode) 3 years for recording (15-minute measurement interval)
Dimensions/weight	187 x 72 x 32 mm / 260 g with batteries
Ingress protection	IP54 casing
Operating temperature/humidity	-10 to +60 °C / 10 to 90 % RH
Standards	IEC61010-1 / IEC 61326-1

CONTENTS

- C.A 1246 delivered with:
 - 1 bag
 - 3 x 1.5 V LR6 batteries
 - 1 USB cable
 - 1 measurement report

ACCESSORIES / REPLACEMENT PARTS

- 75 % salt cartridge P01156401
- 33 % salt cartridge P01156402
- See all the accessories on page 188



C.A 847

Ref. : P01156302Z

STRENGTHS

- Measure the humidity of your materials very simply: prick the material and note the value corresponding to the LED which lights up.

SPECIFICATIONS

	C.A 847
RH range	6 to 100 % RH
Accuracy RH	± 1 LED
Dimensions	173 x 60.5 x 38 mm
Weight	160 g

CONTENTS

- The C.A 847 is delivered with one 9 V 6LR61 battery



THERMO-HYGROMETERS



ADDITIONAL INFO

- Compatible with the Data Logger Transfer module of the Dataview® software for:
 - data display
 - programming of recordings
 - automatic export of the report

ACCESSORIES / REPLACEMENT PARTS

- Cones kit for flow-rate measurement with rotating vane (circular cross-section Ø 210mm and rectangular cross-section 346x346mm) P01654250
- Vane sensor Ø80mm P01654251
- See all the accessories on page 188

C.A 1227

Ref. : P01654227



STRENGTHS

- Temperature, air speed and air flow rate
- Mapping of measured air speeds (MAP mode)
- Min, Max, Average and Hold functions
- Recording up to 1 million points

SPECIFICATIONS

	C.A 1227
Air speed / flow rate sensor	Rotating vane with optical detection
Air speed range	0.25 m/s to 35.0 m/s (49.0 to 6890.0 fpm)
Air speed accuracy	± 3 % of reading ± 4 counts
Air flow rate range	0 to 2,999 m³/h
Air flow rate accuracy	± 8 % of reading
Temp. range °C/°F	- 20.0 to + 50.0 °C / - 4 to + 122 °F
Temp. accuracy °C	0 to 50 °C: ± 0.8 °C / -20 to 0 °C: ± 1.6 °C
Functions	Min., Max., HOLD, Average
Recording	Manual Start / Stop on the product
Data storage	Programmed recording
Power supply	3 x 1.5V LR6 alkaline batteries Mains connection possible with the mains / micro-USB adapter offered as an accessory
Battery life	200 hrs (portable mode) / 8 days of recording (15-minute intervals)
Dimensions	Casing: 150 x 72 x 32 mm Sensor: 160 x 80 x 38 mm Spiral cable: 24 to 120 cm
Weight	Approx. 400 g
Ingress protection	IP40 casing
Operating temperature / humidity	-10 to +60 °C / 10 to 90 % RH
Standards	IEC 61010-1 - IEC 61326-1

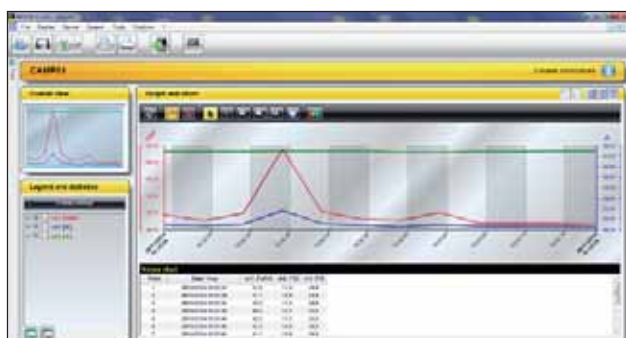
CONTENTS

- C.A 1227 delivered with:
 - 1 bag
 - 3 x 1.5 V LR6 batteries
 - 1 USB cable
 - 1 measurement report



Physics-Log software

- Choice of campaigns to be downloaded
- Linking of operator and customer to the campaigns
- C.A 1052 memory dump
- Display of the curves corresponding to the downloaded data
- Customization of the graphs
- Backup in pdf format for distribution to customer



C.A 1052

Ref. : P01175020

STRENGTHS

- Can be used for comprehensive surveys of air-conditioning, heating and ventilation systems
- Accurate, 5-in-1 instrument: measurement of air speed, relative humidity, flow-rate, pressure and temperature
- Complete: the instrument is delivered as standard with its probes in a case
- Particularly easy to use: connect the probe (recognized automatically) and measure!
- Data backup

SPECIFICATIONS

C.A 1052		
	Measurement range	Accuracy
Hot-wire speed	0.15 to 3 m/s	$\pm 3 \% R + 0.03 \text{ m/s}$
	3.1 to 35 m/s	$\pm 3 \% R + 0.1 \text{ m/s}$
\varnothing 100 mm rotating-vane speed	0.25 to 3 m/s	$\pm 3 \% R + 0.1 \text{ m/s}$
	3.1 to 35 m/s	$\pm 1 \% R + 0.3 \text{ m/s}$
Environmental temperature	-20°C to $+80^{\circ}\text{C}$	$\pm 0.4 \% R + 0.3^{\circ}\text{C}$
Flow-rate	0 to 99,999 m ³ /h	3 % R
Relative humidity	3 to 98 % RH	$\pm 1 \% R + 1.5 \% \text{ RH}$
Dew point	-50°C to $+70^{\circ}\text{C}$	$\pm 0.8 \% R + 0.6^{\circ}\text{C}$
Pressure	0 to 1,000 mm H ₂ O	$\pm 0.2 \% R + 1$
Temperature (2 K-thermocouple inputs)	-200°C to $+1,300^{\circ}\text{C}$	$\pm 0.4 \% R$ or 1.1°C
	-100°C to $+750^{\circ}\text{C}$	$\pm 0.4 \% R$ or 0.8°C
	-200°C to $+400^{\circ}\text{C}$	$\pm 0.4 \% R$ or 0.5°C
Function	HOLD, Min., Max., Avg.	
Recording	8,000 counts	
Dimensions	161.9 x 80.8 x 57.4 mm	
Weight	380 g	

CONTENTS

- C.A 1052 delivered with:
- 1 case with all its probes
- 4 x 1.5 V LR06 batteries
- PhysicsLog software

ACCESSORIES / REPLACEMENT PARTS

- Straight extension P01102010
- Elbowed extension P01102011
- See all the accessories on page 188



C.A 850 - C.A 852

Ref.: P01184101

P01184102

STRENGTHS

- Accurate and simple to use
- Time/date-stamped monitoring
- Differential measurements

SPECIFICATIONS

	C.A 850	C.A 852
Measurement range	-6.89 to +6.89 bar	-138 to +138 mbar
Accuracy	0.3 % full scale	
Unit	psi, bar, mbar, mmH ₂ O, inH ₂ O kbar, cmH ₂ O, FtH ₂ O, mmHg, OZin ² , kg/cm ²	-
Functions	Differential meas., Min., Max., HOLD	
Dimensions	182 x 72 x 30 mm	
Weight	220 g	

CONTENTS

- C.A 850 delivered with:
 - 1 hard case
 - 2 connection tubes
 - 1 x 9 V 6LR61 battery
- C.A 852 delivered with:
 - 1 hard case
 - 2 connection tubes
 - 1 x 9 V 6LR61 battery



C.A 1110

Ref.: P01654110

LUX

FC

CLASS C
NF C
42-710LED
FLUO

STRENGTHS

- Totally compliant lighting measurement in all directions
- Measures up to 200,000 lux
- Mapping of lighting measured for an area or room (MAP mode)
- Metrological compensation on Fluo LEDs.
- Min., Max., Avg. and HOLD
- Recording up to 1 million points

SPECIFICATIONS

	C.A 1110
Measurement range	0.1 lx to 200,000 lx (lux) 0.01 fc to 18,580 fc
Accuracy in standard mode	
Incandescent lamp	± 3% of reading
LED	± 6% of reading (3,000 K to 6,000 K)
Fluorescent lamp	± 9% of reading
Accuracy in compensation mode	
LED mode	± 4% of reading (at 4,000 K)
Fluo mode	± 4% of reading (type F11, 4,000 K)
Functions	Min., Max., HOLD, Average
Recording	Manual Start / Stop on the product Programmed recording
MAP mode	The MAP function can be used to map the lighting on a surface or in a room. In this way, the lighting measurements are saved in the same file.
Data storage	More than 1 million points
Power supply	3 x 1.5V AA / LR6 alkaline batteries or NiMH rechargeable battery Mains connection possible with the mains / micro USB adapter (option)
Battery life	500 hrs (portable mode) / 3 years of recording (15-minute measurement interval)
Dimensions	Casing: 150 x 72 x 32 mm Sensor: 67 x 64 x 35 mm (with protective cover) Spiral cable: 24 to 120 cm
Weight	345 g with batteries
Ingress protection	IP50 casing
Operating temperature / humidity	-10 to +60 °C / 10 to 90 % RH
Standards	Class C as per the French NF C 42-710 standard based on the CIE guidelines

ADDITIONAL INFO

- Compatible with the Data Logger Transfer module of the Dataview® software for:
 - data display
 - programming of recordings
 - automatic export of the report

ACCESSORIES / REPLACEMENT PARTS

- Shockproof sheath + MultiFix accessory P01654252
- Mains adapter P01651023
- See all the accessories on page 188

CONTENTS

- C.A 1110 delivered with:
 - 1 bag
 - 3 x 1.5 V LR6 batteries
 - 1 USB cable
 - 1 measurement report



C.A 832

Ref. : P01185501Z

dBA

dBc

STRENGTHS

- Sound-level testing
- Simple to use

SPECIFICATIONS

	C.A 832
Measurement range	37 to 130 dB
Calibres	3 calibres: 37 to 80 dB 50 to 100 dB 80 to 130 dB
Accuracy	± 2 dB
Frequency range	31.5 Hz to 8,000 Hz
Functions	A and C frequency weighting curves Fast and slow time weighting -
Analogue output	10 mV/dB or 1 V _{RMS}
Data storage	-
Software	-
Dimensions	237 x 60.5 x 38 mm
Weight	230 g

CONTENTS

- C.A 832 delivered with:
 - 1 shockproof sheath
 - 1 jack socket for analogue output
 - 1 universal adapter for tripod mounting
 - 1 x 9 V 6LR61 battery

ACCESSORIES / REPLACEMENT PARTS

- 94 dB or 114 dB sound-level meter calibrator, C.A 833 _____ P01185301
- See all the accessories on page 188



C.A 834

Ref. : P01185502

dBA

dBc

STRENGTHS

- Monitoring of noise-exposure levels: recording of up to 32,000 values!
- Process the data on PC with the software supplied as standard

SPECIFICATIONS

	C.A 834
Measurement range	30 to 130 dB
Calibres	4 calibres: 30 to 80 dB 50 to 100 dB 80 to 130 dB Auto 30 to 130 dB
Accuracy	±1.5 dB
Frequency range	31.5 Hz to 8,000 Hz
Functions	A and C frequency weighting curves Fast and slow time weighting Min., Max, HOLD
Analogue output	10 mV/dB or 1 V _{RMS}
Data storage	32,000 values
Software	Yes
Dimensions	275 x 64 x 30 mm
Weight	285 g

CONTENTS

- C.A 834 delivered with:
- 1 hard case with data processing software
- 1 jack/USB cable
- 1 jack socket for analogue output
- 1 x 9 V 6LR61 battery

ACCESSORIES / REPLACEMENT PARTS

- 94 dB or 114 dB sound-level meter calibrator, C.A 833 P01185301
- Microphone extension for C.A 834 P01102085
- See all the accessories on page 188



TACHOMETERS



CONTENTS

- **C.A 1725** delivered with:
 - 1 hard case
 - 1 FRB F connector
 - 1 x 9 V LR14 battery
 - 1 set of 15 strips of reflective tape (0.1 m long)
 - 1 CD-ROM containing the user manual
- **C.A 1727** delivered with:
 - 1 hard case
 - 1 FRB F connector
 - 1 x 9 V LR14 battery
 - 1 set of 15 strips of reflective tape (0.1 m long)
 - 1 CD-ROM containing the TACHOGRAPH software

C.A 1725 - C.A 1727

Ref. : P01174810

P01174830

STRENGTHS

- Measurements up to 100,000 RPM
- Measurement with and without contact
- Multiple functions available: rotation speed, linear speed, counting, frequency, period
- Possibility of programming and storage capacity
- **C.A 1727**
- USB connection to process the recordings on PC

SPECIFICATIONS

	C.A 1725	C.A 1727
RPM functions		
Range	60 to 100,000 RPM	
Accuracy	$10^{-4} R \pm 6$ cts	
m/min function		
Range	60 to 10,000 m/min.	
Accuracy	$10^{-4} R \pm 1$ increment	
Hz function		
Range	1 to 10,000 Hz	
Accuracy	$4 \times 10^{-5} R \pm 4$ cts	
ms function		
Range	0.1 to 1,000 ms	
Accuracy	$10^{-4} R \pm 5$ cts	
Report function		
Range	0.1 to 100%	
Accuracy	0.1% to 1%	
Counting function		
Range	-	0 to 100,000 events
Accuracy	-	± 1 events
Functions	Min., Max., HOLD, Smooth	High and low alarms
Data storage	-	4,000 counts
Dimensions	21 x 72 x 47 mm	
Weight	250 g	

ACCESSORIES / REPLACEMENT PARTS

- Mechanical accessories kit P01174902
- End-fittings (set of 3) P01174903
- See all the accessories on page 188



CDA 9452

Ref. : P03197704



Flashes
/min

STRENGTHS

- Frequency or speed measurement without contact with rotating parts
- Digital frequency display
- Quartz time base
- White flash lamp, 40 joules

SPECIFICATIONS

	CDA 9452
LED display	10,000 points
Measurement range	100... 1,000 flashes/min 1000... 10,000 flashes/min
Resolution	1 flash/min
Accuracy	0.05 %
Power supply	220 V – 50/60 Hz
Climatic conditions	0... + 50 °C / RH < 80 %
Dimensions	210 x 120 x 120 mm
Weight	1 kg

ADDITIONAL INFO

- When the flashes from the stroboscope are directed at an object moving periodically and have the same frequency as the phenomenon observed, the object appears immobile. All you then need to do is read the frequency expressed in flashes/minute on the CDA 9452. To obtain the frequency in Hz, simply divide the reading by 60.

CONTENTS

- CDA 9452 delivered with mains power cable

CO₂, TEMPERATURE & HUMIDITY LOGGER

C.A 1510

Ref. : P01651011

PPm
CO₂

°C

°F

RH



SPECIFICATIONS

C.A 1510	
Specifications for CO ₂	
Measurement range	0 to 5,000 ppm
Accuracy	± 50 ppm ± 3% of measured value
Resolution	1 ppm
Temperature measurement	
Measurement range	-10 °C to +60 °C
Accuracy	± 0.5 °C
Resolution	0.1 °C
Humidity measurement	
Measurement range	5 to 95 % RH
Accuracy	± 2% RH
Resolution	0.1% RH
Product capabilities	
Portable measurement	Quick measurement and display of the CO ₂ , temperature and relative humidity values
Indicator	<p>Mode 1D : CO₂ confinement indication Visual indication (two-colour backlighting and pictograms) and/or audible indication of high confinement when the CO₂ concentration is between 1,000 ppm and a 1,700 ppm threshold.</p> <p>3D mode: indication of optimum comfort zone on the basis of hygrothermal criteria and the CO₂ concentration</p>
Energy saving (ECO)	For fixed use on battery power, the product performs measurements every 10 minutes over a programmable time range for a battery life of up to one year
Logger	<p>Activation of programmed recording (P_REC) The start date, recording rate and end date can be customized with the PC software or the Android application. Possibility of locking the display in this mode (no values displayed).</p> <p>Manual activation (M_REC) Manual start and stop controls on the product. Recording is performed at the rate of the mode currently selected.</p>
Specifications	
Recording rate	Customizable from 1 minute to 2 hours
Data storage	More than 1 million points
Buzzer and units	Yes / °C or °F
Backlighting / Hold / Min Max	Yes
Dimensions / weight	125 x 65.5 x 32 mm / 190 g with batteries
Power supply	Batteries: 2 x 1.5 V AA / LR6 or rechargeable battery Connection to mains possible with mains / micro USB adapter supplied as standard
Interfaces	2 communication modes possible: Bluetooth wireless communication and USB link; the product is then recognized as a USB key for easy file transfer
Mounting	C.A 1510 casing equipped with a magnet, a wall-suspension system and a slit for hanging the product. A wall support for use with a padlock (padlock not supplied) is available as an accessory, as is a desktop stand (supplied as standard with the C.A 1510W).
AQR (Air Quality Report) software supplied as standard	Graphic representation or as table of values - Data export - Real-time mode Calculation of the confinement index with selection of presence periods - Report generation

STRENGTHS

- CO₂, temperature and humidity logger (up to 1 million points)
- Compact: for fixed or portable use
- User-friendly: thanks to the comfort-level indicators based on the level of CO₂ and hygrothermal criteria
- Accurate: complies with the latest regulations on air-quality monitoring
- Low gas consumption thanks to its in-situ calibration kit

ADDITIONAL INFO

- C.A 1510 also available in black P01651010
- Delivered in a metal case

CONTENTS

- Delivered in cardboard box with:
- 2 x 1.5 V LR06 batteries
- 1 USB mains adapter
- 1 USB-micro USB cable
- 1 desk stand
- AQR software
- 1 user manual (5 languages) on CD-ROM
- 1 verification certificate

ACCESSORIES / REPLACEMENT PARTS

- In-situ calibration kit P01651022
- Metal case P01298071
- See all the accessories on page 188



C.A 895

Ref. : P01651001Z

**PPm
CO**

STRENGTHS

- Measures the level of carbon monoxide present in a room
- Checks the operation of combustion equipment
- Warning buzzer to indicate when there is a risk

SPECIFICATIONS

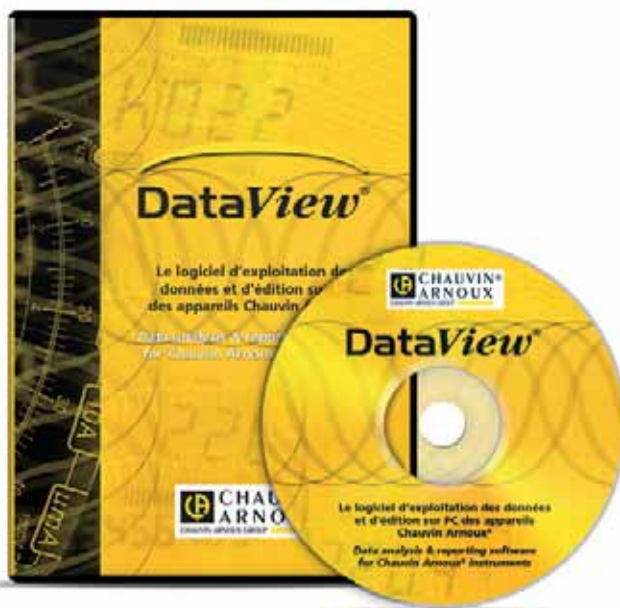
	C.A 895
Measurement range	0 to 1,000 ppm
Accuracy	± 5 % + 5 ppm
Measurement mode	Normal or Avg.
Functions	Alarm, Max., HOLD
Dimensions	237 x 60.5 x 38 mm
Weight	190 g

CONTENTS

- C.A 895 delivered with:
- 1 shockproof protective sheath
- 1 x 9 V LR14 battery

ACCESSORIES / REPLACEMENT PARTS

- Aspiration kit with pump and extension P01651101

**DATAVIEW®**

Ref. : P01102095

**Data Logger
Transfer****FUNCTIONS**

- Configuration of all the functions of instruments connected to a PC or via Bluetooth
- Display of the data in table and graph form
- Export to an Excel spreadsheet or jpeg image
- Programming of recordings (date and rate)
- Automatic export of reports in Word format

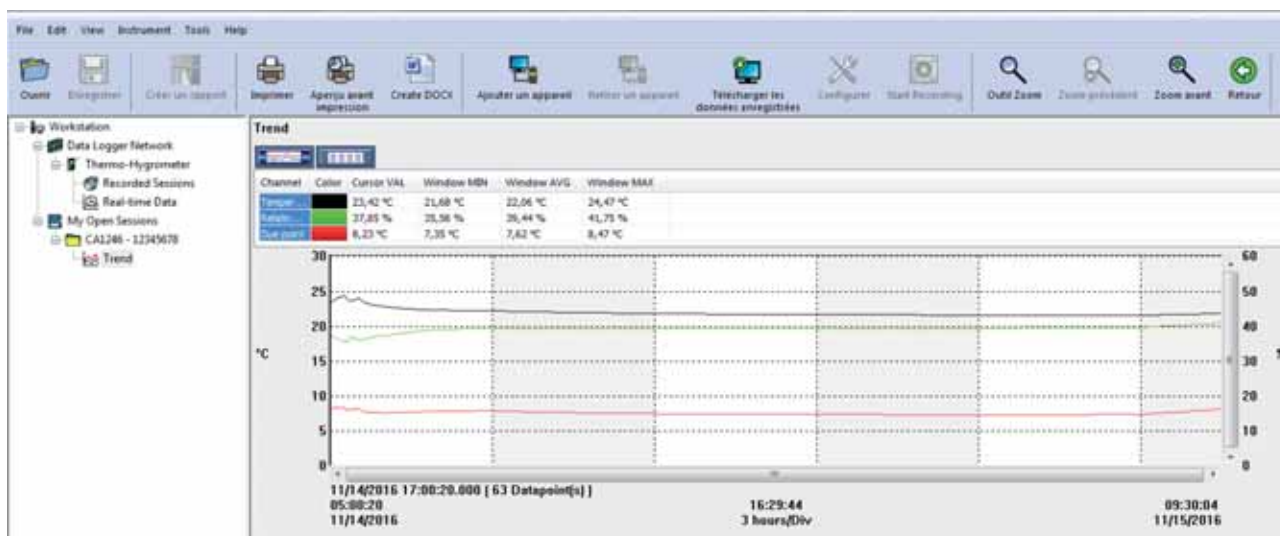
ADDITIONAL INFO

- Totally configurable alarms and recordings on alarms
- The **Dataview®** software automatically recognizes the instrument connected when it is hooked up to the PC and launches the corresponding menu. Users then have direct access to its configuration and to the stored data.

REQUIRED CONFIGURATION

- Windows Vista & Windows 7/8/10 (32/64 bit)
- 1 GB RAM for Windows Vista & Windows 7/8 (32 bit)
- 2 GB RAM for Windows Vista & Windows 7/8 (64 bit)
- 80 MB available space on hard disk (200 MB recommended)

DataView® modules	Data Logger Transfer
Related products	C.A 1821
	C.A 1822
	C.A 1823
	C.A 1246
	C.A 1227
	C.A 1110



General Recording Thermo-Hygrometer Alarms

Session name:

Session type:
☐ Record now
☐ Schedule recording
☐ Alarm triggered recording

Start date: 26/11/2016 Start time: 10:22:00
 End date: 26/11/2016 End time: 10:37:00

Storage duration: 000 : 00 : 15 : 00 D : H : M : S

Sampling period:
 Demand period: 1 s

Estimated battery autonomy:
 Not recording: Not
 When recording: Not

The battery autonomy is only indicative. It takes into account the voltage level of batteries, which is dependent of temperature and battery quality. This indication assumes that your batteries were fully charged when replaced.

Disk space:
 10.23% of the memory has been used.
 7.15 Mbytes of available memory. 7.16 Mbytes total memory capacity.

0.08% of the memory is needed by the current recording settings.
 You should modify the settings of your recording or make space in the memory.

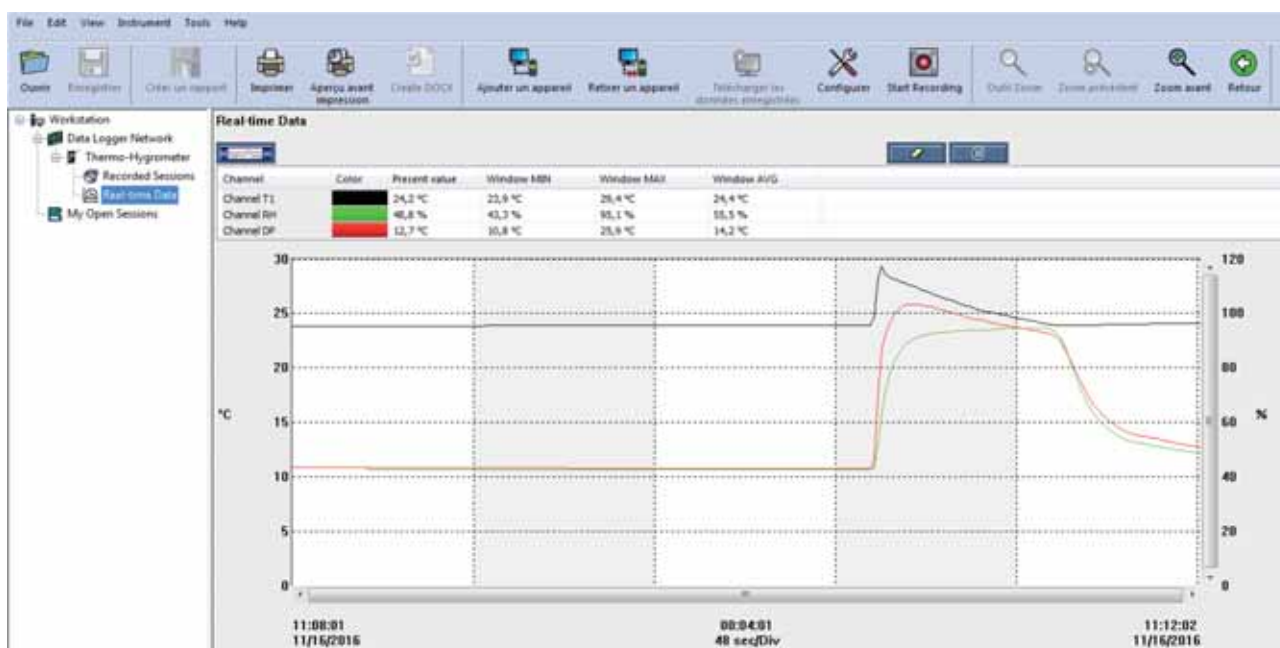
☐ Keyboard locked during recording
 Select this option to disable any keyboard action during recording. Once the recording starts with this option, keyboard is locked until the end of recording (end of session reached or with the "Stop recording" command of PhysICA Control Panel).

Read Save Load

Data Logger Transfer - C:\Users\arnoux\Documents\Chauvin-Arnoux\Data Logger\2016\11\15\2016\111500175\Sess0001.measurement

Date	Time	Temperature	Relative Humidity	Dew point
24/11/2016	17:44:06	23.22 °C	36.00 %	7.77 °C
24/11/2016	17:44:07	23.22 °C	36.00 %	7.77 °C
24/11/2016	17:44:08	23.22 °C	36.00 %	7.77 °C
24/11/2016	17:44:09	23.22 °C	36.00 %	7.77 °C
24/11/2016	17:44:10	23.22 °C	36.00 %	7.77 °C
24/11/2016	17:44:11	23.22 °C	36.00 %	7.77 °C
24/11/2016	17:44:12	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:13	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:14	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:15	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:16	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:17	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:18	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:19	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:20	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:21	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:22	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:23	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:24	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:25	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:26	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:27	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:28	23.21 °C	36.01 %	7.77 °C
24/11/2016	17:44:29	23.21 °C	36.01 %	7.77 °C
24/11/2016	17:44:30	23.21 °C	36.00 %	7.76 °C
24/11/2016	17:44:31	23.21 °C	36.01 %	7.77 °C
24/11/2016	17:44:32	23.21 °C	36.01 %	7.77 °C
24/11/2016	17:44:33	23.22 °C	36.01 %	7.76 °C











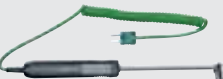




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THERMOMETERS

K-THERMOCOUPLE SENSORS

Model	Model	Description
	SK20	Sheathed sensor as per the NF EN 61615 standard. Hot junction isolated from chassis-earth. Inconel 600 protective sheath
	SK6	"General-purpose" sensor recommended for measurements where access is difficult. Do not use in liquids (tip is not leakproof)
	SK2	Sensor with stainless-steel sheath which can be bent as required Radius of curvature > 4 mm
	SK3	Slightly bendable sensor with stainless-steel sheath
	SK13	Sensor with stainless-steel sheath
	SK7	In "calm" conditions without air movement, shake the sensor to encourage heat exchange
	SK17	In "calm" conditions without air movement, shake the sensor to encourage heat exchange
	SK1	Sensor with stainless-steel sheath for penetration (20 mm min.) in pasty, viscous or liquid specimens
	SK11	Sensor with stainless-steel sheath for penetration (20 mm min.) in pasty, viscous or liquid specimens
	SK4	Sheathed sensor with stainless-steel sensing element and Teflon base. For small flat surfaces. Contact can be improved by using silicone grease.
	SK14	For surface temperatures when access is difficult
	SK5	For flat surfaces. The spring ensures optimum contact even if the sensor is not positioned perpendicularly. Contact can be improved by using silicone grease.
	SK15	For flat surfaces. The spring ensures optimum contact even if the sensor is not positioned perpendicularly. Contact can be improved by using silicone grease.
	SK8	For measurements on pipes. The copper sheet is applied to the clean, dry pipe. The two-sided Velcro strip ensures contact by winding.
	SK19	Sensor with magnet for flat metal surfaces

Class I accuracy / -40 °C to +375 °C: $\pm 1.5^{\circ}\text{C}$ / +375 °C to +1,000°C: $\pm 0.004 \times T^{\circ}\text{C}$.
Class II accuracy / -40 °C to +333 °C: $\pm 2.5^{\circ}\text{C}$ / +333 °C to +1,200°C: $\pm 0.0075 \times T^{\circ}\text{C}$.



Type / Application	Measurement range	Tolerance class	63% response time	Plunger diameter	Plunger length	Ref.	Model
Flexible general-purpose sensor	-50°C to 450°C	Cl. 1	1 s	1.5 mm	1 m	P01655010	SK20
Flexible sensor	-50°C to 285°C	Cl. 2	1 s contact	1 mm	1 m	P03652906	SK6
Bendable general-purpose sensor	-50°C to 1,000°C	Cl. 2	3 s ambient	2 mm	1 m	P03652902	SK2
Semi-rigid general-purpose sensor	-50°C to 1,000°C	Cl. 2	2 s	4 mm	50 cm	P03652903	SK3
General-purpose sensor	-50°C to 1,100°C	Cl. 2	6 s	3 mm	30 cm	P03652918	SK13
Air sensor for ambient measurements	-50°C to 250°C	Cl. 2	12 s	5 mm	15 cm	P03652907	SK7
Air sensor for ambient measurements	-50°C to 600°C	Cl. 2	5 s	6 mm	13 cm	P03652921	SK17
Needle sensor for penetration	-50°C to 800°C	Cl. 2	1 s	3 mm	15 cm	P03652901	SK1
Needle sensor for penetration	50°C to 600°C	Cl. 2	12 s	3 mm	13 cm	P03652917	SK11
Surface sensor	0°C to 250°C	Cl. 2	1 s	5 mm	15 cm	P03652904	SK4
Elbowed surface sensor	-50°C to 450°C	Cl. 2	8 s	6 mm	13 cm	P03652919	SK14
Surface sensor with spring	-50°C to 500°C	Cl. 2	1 s	5 mm Ø in contact 8.5 mm	15 cm	P03652905	SK5
Surface sensor with spring	-50°C to 900°C	Cl. 2	2 s	8 mm	13 cm	P03652920	SK15
Pipe sensor	-50°C to 140°C	Cl. 2	10 seconds on stainless-steel pipe with 12 mm diameter	90 mm	32 cm	P03652908	SK8
Magnetic sensor	-50°C to 200°C	Cl. 2	7 s	4 mm	1 m	P03652922	SK19

Standard compensated miniature male 2-pole connector
Spiral cable: 45 cm to 1m



EXTENSIONS FOR THERMOCOUPLES

	CK 1	CK 2	CK 3	CK 4
Models	Description		Ø	Length
CK 1	Terminated by male plug / female plug		4 mm	1 m
CK 2	Terminated by male plug / 2 bare wires		4 mm	1 m
CK 3	Terminated by 5-pin DIN plug / female socket		4 mm	1 m
CK 4	Terminated by 2 banana plugs / female socket		4 mm	1 m
Temperature withstand of extensions: -40 °C to +100 °C				



CK 3 CK 2 CK 1 CK 4

REFERENCES TO ORDER

■ CK 1	P03652909	■ CK 3	P03652913
■ CK 2	P03652910	■ CK 4	P03652914

ACCESSORIES / REPLACEMENT PARTS

- PP1 handle for CK extensions P03652912
- Compensated miniature male 2-pole connector P03652925



CAPTEURS DE TEMPÉRATURE PT 100 Ω

- Pt 100 Ω temperature sensors

Models	Type	Type / Application	Description	Measurement range	Classe de tolérance	Response time	Ø	Length	Ref.
	SP 10	Surface sensor with spring	For flat surfaces The spring ensures optimum contact, even if the sensor is not set up perpendicularly.	-50 °C to +200 °C	Cl. B	6 s	5 mm	13 cm	P03652712
	SP 11	Needle sensor	For penetration (20 mm minimum) in pasty, viscous or liquid media.	-100 °C to +600 °C	Cl. B	7 s	3 mm	13 cm	P03652713
	SP 12	Air sensor	Suitable for all ambient air measurements (moving air). If the air is stationary, agitate the sensor to favour heat exchange.	-100 °C to +600 °C	Cl. B	5 s	5 mm	13 cm	P03652714
	SP 13	Immersion sensor	Sensor with stainless-steel sheath specially designed for liquids	-100 °C to +600 °C	Cl. B	7 s	3 mm	13 cm	P03652715
	SP 14	General-purpose sensor	316L stainless-steel sensor for general use	-40 °C to 450 °C	Cl. A	7 s	3 mm	20 cm	P01655020

Accuracy class A / $0.15\text{ °C} + 0.002 \times T\text{ °C}$

Accuracy class B / $0.3\text{ °C} + 0.005 \times T\text{ °C}$

Miniature 3-pole flat-pin connector

Spiral cable from 45 cm to 1m



CALIBRATORS

C.A 1621, C.A 1623 and C.A 1631

■ Mains power supply	P01103057
■ MultiFix bag 120 x 245 x 60 mm	P01298075
■ Set of 2 red/black crocodile clips	P01295457Z
■ Set of 2 red/black moulded PVC leads	P01295451Z
■ Set of 2 moulded test probes Ø 4 mm	P01295458Z

THERMAL CAMERAS

C.A 1882

■ Battery	P01296045
■ Battery charger	P01296046
■ Bag	P01298075
■ Docking station	P01651528
■ Mains power supply	P01651527
■ Sun shade	P01651532
■ In-vehicle charger adapter	HX0061

C.A 1886 and C.A 1888

■ Sun shade	P01651531
■ Photo tripod adapter	P01651526
■ Lens cover	P01651522
■ USB cable	P01295274
■ Battery	P01296041
■ Battery charger	P01296043
■ Mains power supply	P01651527
■ In-vehicle adapter (cigarette lighter)	HX0061

THERMOMETERS

C.A 1821, C.A 1822 and C.A 1823

■ Shockproof sheath + Multifix	P01654252
■ Multifix	P01102100Z
■ Mains adapter	P01651023
■ Bag	P01298075
■ Metal case	P01298071
■ Dataview® software	P01102095
■ Bluetooth BLE / USB modem for PC	P01654253

THERMO-HYGROMETER

C.A 1246

■ 75%RH salt cartridge	P01156401
■ 33%RH salt cartridge	P01156402
■ Shockproof sheath + Multifix	P01654252
■ Multifix	P01102100Z
■ Mains adapter	P01651023
■ Bag	P01298075
■ Metal case	P01298071
■ Dataview® software	P01102095
■ Bluetooth BLE / USB modem for PC	P01654253

THERMO-ANEMOMETER

C.A 1227

■ Cones kit for vane flow-rate measurement (circular cross-section Ø 210mm and rectangular cross-section 346x346mm)	P01654250
■ Vane sensor Ø80mm	P01654251
■ Shockproof sheath + Multifix	P01654252
■ Multifix	P01102100Z
■ Mains adapter	P01651023
■ Bag	P01298075
■ Metal case	P01298071
■ Dataview® software	P01102095
■ Bluetooth BLE / USB modem for PC	P01654253

LUXMETER

C.A 1110

■ Shockproof sheath + Multifix	P01654252
■ Multifix	P01102100Z
■ Mains adapter	P01651023
■ Bag	P01298075
■ Metal case	P01298071
■ Dataview® software	P01102095
■ Bluetooth BLE / USB modem for PC	P01654253

MULTI-FUNCTION INSTRUMENT

C.A 1052

■ Straight extension	P01102010
■ Elbowed extension	P01102011
■ Telescopic extension	P01102012
■ Rotating-vane flow-rate cone	P01173105
■ C.A 828 hot-wire flow-rate cone	P01173107
■ Pitot tube	P01102048
■ Case	P01298072



SOUND-LEVEL METERS

C.A 832 and C.A 834

- C.A 833 94 dB or 114 dB sound-level meter calibrator P01185301
- Microphone extension for C.A 834 (5 metres) P01102085
- Wind cap P01102083
- Jack/USB cable for C.A 834 P01295478

TACHOMETERS

C.A 1725 and C.A 1727

- Mechanical accessories kit P01174902
- End-fittings (set of 3) P01174903
- Reflective tape (15 x 0.1 m strips) P01101797
- FRB F socket P01101785
- TACHOGRAPH software on CD-ROM P01174835
- USB-A to USB-B cable P01295293

CO₂, TEMPERATURE & HUMIDITY LOGGER

C.A 1510

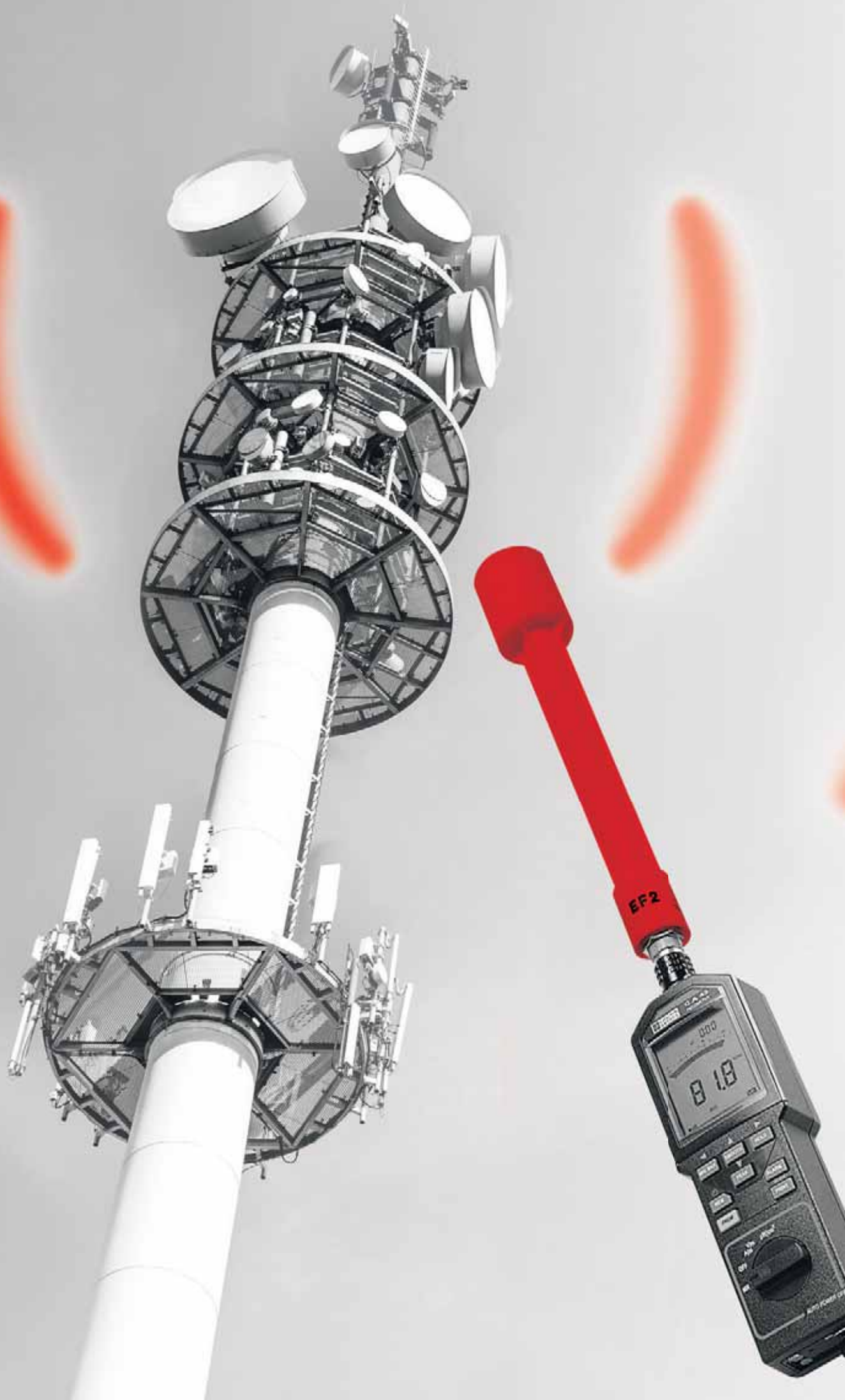
- In-situ calibration kit P01651022
- Hard case P01298071
- Desk stand P01651021
- Wall support P01651020
- USB mains adapter P01651023
- USB-Bluetooth adapter P01102112

CO DETECTOR

C.A 895

- Aspiration kit with pump and extension P01651101

FIND ALL OUR ACCESSORIES ON PAGE 230



RADIOFREQUENCY & MICROWAVE MEASUREMENTS

Info and advice

196

LAN tester

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Fieldmeters

200

Wattmeters / reflectometers

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Accessories

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COMPUTER NETWORK AND TELECOM TESTING

The wiring of a physical infrastructure may be defined as a set of specific elements through which it is possible to transfer information. Usually linked to computer networks,

the performance requirements of wiring systems are evolving rapidly and they must now be capable of conveying other types of information, such as voice or video.

COPPER NETWORK WIRING

A category-5 or higher network cable comprises an external sheath, 8 copper wires organized in 4 pairs and an earth wire. There are different levels of cable shielding, with shielding per pair, global shielding or both.

THE DIFFERENT TYPES OF CABLES

The ISO/IEC 11801 standard defines official naming conventions for copper cables. The names describe the global protection of the cable, on the one hand, and the protection of the pairs of copper conductors, on the other.

Copper cables are named as follows: X / Y TP

X: Global protection of the cable

Y: Protection of the pairs

TP: Twisted Pairs

The following values are possible for X and Y:

U = Unshielded, no protection

S = Shielded with a tin-plated braid

F = Foiled, shielded with aluminium foil

		Shielding efficiency
U/UTP Global shielding: None (U) Shielding per pair: None (U)		☹☹☹
F/UTP Global shielding: Aluminium foil (F) Shielding per pair: None (U)		☹☹
SF/UTP Global shielding: Tin-plated braid and aluminium foil Shielding per pair: None (U)		☹
U/FTP Global shielding: None (U) Shielding per pair: Aluminium foil (F)		😊
F/FTP Global shielding: Aluminium foil (U) Shielding per pair: Aluminium foil (U)		😊😊
S/FTP Global shielding: global tin-plated braid Shielding per pair: Aluminium foil per pair		😊😊😊

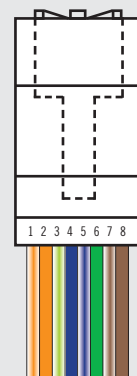
THE RJ45 CONNECTOR

This connector with 8 positions and 8 electrical contacts is very widely used to terminate cables with twisted pairs:

MODULAR MALE RJ45 JACK SOCKET



T568A
(clip below)



T568B
(clip below)

EIA/TIA 568A standard

Name	No.	Colour
TD+	1	White/Green
TD-	2	Green
RD+	3	White/Orange
Not used	4	Blue
Not used	5	White/Blue
RD-	6	Orange
Not used	7	White/Brown
Not used	8	Brown

EIA/TIA 568B standard

Name	No.	Colour
RD+	1	White/Orange
RD-	2	Orange
TD+	3	White/Green
Not used	4	Blue
Not used	5	White/Blue
TD-	6	Green
Not used	7	White/Brown
Not used	8	Brown



MEASUREMENT OF ELECTROMAGNETIC FIELDS

Any system using electricity as an energy source generates electromagnetic radiation when it is in operation. Depending on the design of the system, the electromagnetic fields which it produces may be propagated in the space around it, extending significantly further than the external limits defined by its enclosure (casing) or the site where it is installed. This is the case for electrical machinery, motors, welding units, induction furnaces, high-voltage power lines, transformer stations, household electrical appliances and electronic instruments used for data processing, transmission, monitoring or measurement. These electromagnetic fields

interact with matter, both inanimate (interference with nearby electrical devices) and animate (plants, animals, etc.). It is therefore important to be able to measure the values of the radiated magnetic and electric fields propagated around any electrical or electronic device:

- to overcome the purely technical problems linked to the electromagnetic compatibility of instruments and machines,
- but also to make sure that the people living and working near these electrical systems are not exposed to fields liable to cause lasting or even temporary negative effects on them.

THE ELECTROMAGNETIC WAVE

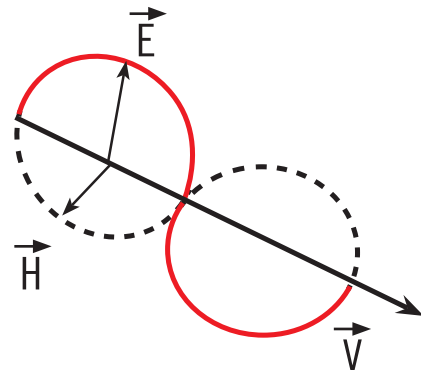
The electromagnetic wave is **the radiated energy produced by the oscillation of an electrical load**. It is characterized by oscillation of the electrical and magnetic fields. Each system generating or absorbing electrical energy is the source of electromagnetic waves in the form of variable electric fields and magnetic fields which are propagated in the air at the speed of light.

Roughly speaking, an electromagnetic wave comprises:

The electric field (E): generated by the difference in potential between two conductors subjected to an electrical voltage, this field depends on the voltage V.

The magnetic field (H): as this field is generated by a current in a conductor, it depends on the current i.

In the case of a sinusoidal alternating wave, the electric field E and the magnetic field H are sinusoidal and in phase. Their directions are perpendicular to one another and perpendicular to the direction of propagation.



Representation of the three components of an electromagnetic wave

This wave is characterized by its frequency F in Hertz (Hz) or its wavelength in metres; these two quantities are linked by the following relation:

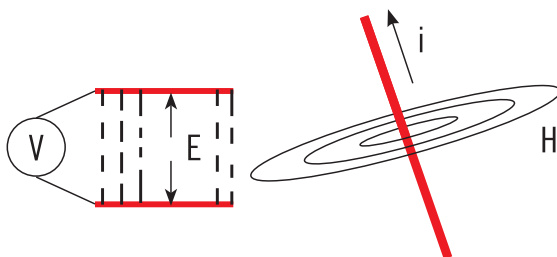
$$\lambda = C_0 / F$$

where C_0 = the speed of light in m/s,
i.e. 300,000 km/s = 3×10^8 m/s

F = frequency in Hz

λ = wavelength in m

Example: for a wave at 300 MHz, the wavelength is 1 metre.



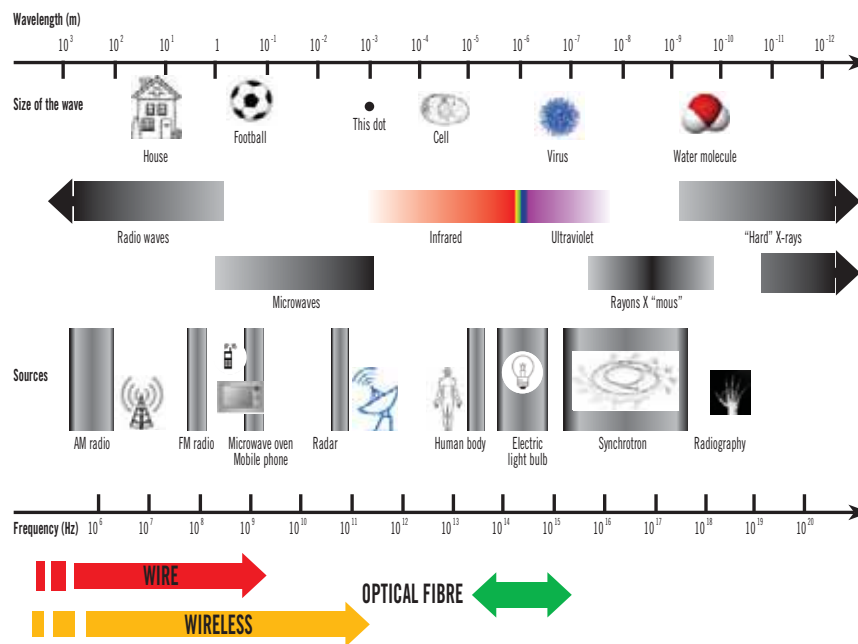


MEASUREMENT OF ELECTROMAGNETIC FIELDS

THE ELECTROMAGNETIC SPECTRUM

The electromagnetic spectrum is the decomposition of the electromagnetic radiation into its different components in terms of wavelength. Some waves can be detected with

the human eye, while others have much lower frequencies detectable using radio devices.



INTERACTIONS WITH MATTER

The effects of electric and magnetic fields on matter and tissues vary according to their frequency and their intensity. Low-frequency fields are liable to induce electric currents in matter and biological tissues.

Effects described as "thermal" may follow. These thermal effects are the basis for the action of higher-frequency fields used in certain applications (cooking and drying with microwaves).

OBLIGATIONS

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has defined exposure limits adopted in many countries. The exposure limits adopted by the European Community are based on a recommendation issued by the ICNIRP, including those in Directive 1999 / 519 / CE (public) and the recent directive 2013/35/UE of 26th June 2013 concerning workers' exposure to electromagnetic fields, which must be transposed into law in the member states by 1st July 2016. For the latter directive, the employer's role will be to assess the hazards and determine the exposure which can be measured in order to find out objectively whether the standard recommended thresholds have been exceeded or not.



C.A 7028

Ref. : P01129501

**RJ
45**

STRENGTHS

- Graphical screen
- Detects, identifies and locates faults from up to 150 m away
- Designed for use on UTP, STP, FTP, & SSTP cables equipped with RJ45 connectors and wired in compliance with the TIA 568A/B, USOC or ISDN specifications

SPECIFICATIONS

	C.A 7028
Connector	RJ 45
Types of cables	UTP, STP, FTP & SSTP
Faults indicated	Short-circuited pair, Wire in open circuit, Short-circuit between pairs, Crossed pairs, Reversed pairs, Shielding continuity
Remote modules	Identifiers nos. 1 to 9
Dimensions	165 x 90 x 37 mm
Weight	350 g

ACCESSORIES / REPLACEMENT PARTS

- Set of 4 identifiers nos. 2 to 5 P01101994
- Set of 4 identifiers nos. 6 to 9 P01101995
- See all the accessories on page 203

CONTENTS

- C.A 7028 delivered with:
- 2 RJ45 leads
- 1 identifier no. 1
- 1 soft case
- 4 x 1.5 V LR06 batteries



LOW-FREQUENCY FIELDMETER



C.A 40

Ref.: P01167501

STRENGTHS

- Measurement of low-frequency magnetic fields
- Quick assessment of the radiation from equipment and installations
- Easy-to-handle unidirectional probe

SPECIFICATIONS

	C.A 40		
Magnetic field measurement	20 μ T	200 μ T	2,000 μ T
Accuracy	$\pm(4\%+3\text{ cts})$	$\pm(5\%+3\text{ cts})$	$\pm(10\%+5\text{ cts})$
Frequency range	30 to 300 Hz		
Power density	-		
Output	-		
Probe	Unidirectional		
Alarm	-		
Data storage	-		
Dimensions	163 x 68 x 24 mm		
Weight	285 g		

CONTENTS

- 1 probe
- 1 x 9 V 6LR61 battery

ACCESSORIES / REPLACEMENT PARTS

- Soft case _____ P01298036



C.A 41 - C.A 43

Ref.: P01167001B

P01167002A

STRENGTHS

- Measurement of electric fields and detection of radiation sources over a wide frequency band
- Isotropic probe: measures the field in all directions
- Storage of measurement points with the C.A 43

SPECIFICATIONS

	C.A 41		C.A 43	
Electric field measurement	0.1 to 1 V/m	1 to 10 V/m	10 to 100 V/m	100 to 200 V/m
Accuracy	0.7 V/m	0.5 V/m	1 dB	2 dB
Frequency range	100 kHz to 2.5 GHz			
Power density	-		0.1 to 2 mW/cm ²	
Output	Analogue		Digital on optical fibre	
Probe	Isotropic			
Alarm	Configurable high and low thresholds			
Data storage	-		1,920 points	
Dimensions	216 x 72 x 37 mm			
Weight	350 g			

CONTENTS

- **C.A 41** delivered with:
 - 1 hard case
 - 1 EF2A probe
 - 1 x 9 V 6LR61 battery
- **C.A 43** delivered with:
 - 1 hard case
 - 1 EF2A probe
 - Optical fibre
 - 1 PC adapter
 - 1 CD-ROM containing data processing software
 - 1 x 9 V 6LR61 battery

ACCESSORIES / REPLACEMENT PARTS

- EF2A isotropic probe P01167202B
- Shockproof sheath P01298009B
- See all the accessories on page 203



RW 511 - RW 5012 - RW 501

Ref.: P01255102

P01255104

P01255101

RW 521

Ref.: P01255103

STRENGTHS

Wattmeters developed for military and civilian applications:

- Simple installation testing
- Testing of the assembly comprising the transmitter, cable and antenna
- 1 product for each market:
 - Single side-band transmission (RW 511)
 - VHF networks, police, emergency services (RW 5012)
 - Radio, FM and TV networks (RW 501)
 - Rural VHF – HF networks (RW 521)

SPECIFICATIONS

	RW 521	RW 511	RW 5012	RW 501
Frequencies	1.3 ... 2.7 GHz	2 ... 30 MHz	25 ... 500 MHz	25 ... 1,300 MHz
Incident power	+10 ... +40 dBm	30 ... 1,000 W	1 ... 300 W	1 ... 300 W
Reflected power	+5 ... +35 dBm	10 ... 300 W	0.3 ... 100 W	0.3 ... 100 W
Accuracy	± 6 %	± 7.5 %	± 6 %	± 6 %

CONTENTS

- RW 511 delivered with:
 - 1 x 9V 6LR61 battery
- RW 5012, RW 501 and RW 521 delivered with:
 - 2 x 1.5 V LR06 batteries

ACCESSORIES / REPLACEMENT PARTS

- Bag P01298046
- SWR chart for RW 501, 511 & 5012 P01255901
- See all the accessories on page 203



LAN TESTER

C.A 7028

- Set of 4 identifiers nos. 2 to 5 _____ P01101994
- Set of 4 identifiers nos. 6 to 9 _____ P01101995
- Bag _____ P01298532

WATTMETERS/REFLECTOMETERS

RW 511, RW 5012, RW 501 and RW 521

- Bag _____ P01298046
- SWR chart for RW 501, 511 & 5012 _____ P01255901
- SWR chart for RW 521 _____ P01255902

FIELDMETERS

C.A 40

- Soft case for C.A 40 _____ P01298036

C.A 41 and C.A 43

- EF2A isotropic probe _____ P01167202B
- Shockproof sheath _____ P01298009B

FIND ALL OUR ACCESSORIES ON PAGE 230





LABORATORY & EDUCATIONAL INSTRUMENTATION

Info and advice

206

Training benches

207

Training cases

210

Other instruments

213



Electricity, electronics, physics, industrial maintenance & the environment: these are disciplines where **measurement is crucial for identifying and understanding** theoretical phenomena through practical experience. We offer **simple,**

educational equipment to help students to learn about subjects ranging from the study of electrical signals to the maintenance of electrical systems.

STUDYING SIMPLE ELECTRICAL PHENOMENA

In Electronics training, students discover the techniques using electrical signals to capture, transmit, process, store and view data. To help them, **the electrical quantities may be generated by decade boxes or simulation cases.** These quantities are measured by traditional measuring instruments such as voltmeters, ammeters, wattmeters and multimeters.



These resistance, capacitance or inductance decade boxes are passive elements for insertion into test or development circuits in order to obtain the required resistance, capacitance or inductance values by combination.

Quantity	Unité
Resistance R	Ω (ohm)
Current I	A (ampere)
Voltage V	V (volt)
Power P	W (watt)
Capacitance C	F (farad)
Inductance L	H (henry)



COMPLIANCE WITH THE IEC 61010-1 STANDARD

These **decade boxes comply with the IEC 61010-1 safety standard** which establishes the safety rules for electrical measuring, control and laboratory instruments.

This standard defines the normal environmental conditions of use:

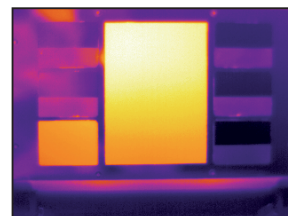
- Indoor use
- Altitude up to 2,000 m
- Temperature from 5 °C to 40 °C

- Maximum relative humidity of 80 % at temperatures up to 31 °C, with a linear decrease down to 50 % relative humidity at 40 °C
- Fluctuations of the network supply voltage from the network not exceeding ± 10 % of the rated voltage
- Normal presence of transient overvoltages on the network power supply

PRACTICAL APPLICATIONS ENCOURAGE SUCCESSFUL LEARNING

Electrical installation cases, power and harmonics cases, microwave test benches and an **infrared thermography bench**: Chauvin Arnoux provides students with **ready-to-use** educational units which are ideal **for a large number of experiments.**

Their overall design aims to ensure simple use and measurements. **Delivered with a guide containing practical exercises** accompanied by the corresponding theoretical elements, these training cases enable students to boost their knowledge with practical skills likely to prove useful during their careers.





C.A 1875

Ref. : P01651620

PRACTICAL
EXERCISES

STRENGTHS

- Highlighting of the various possible errors in thermography: problems linked to emissivity, spatial resolution, angle of measurement, transmission or reflection
- Simple use and simple measurements
- Delivered with a booklet of practical exercises accompanied by the corresponding theoretical principles

SPECIFICATIONS

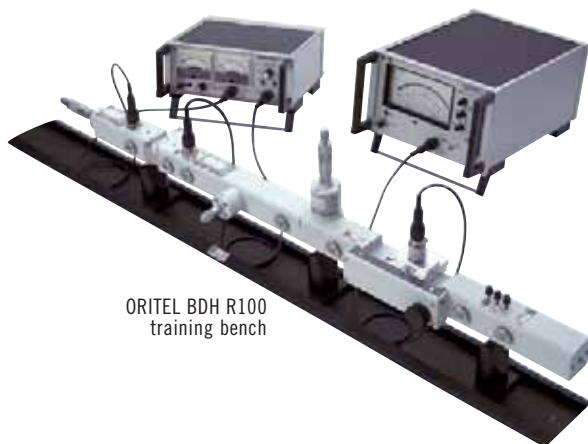
	C.A 1875
Emissivity of materials	The influence of emissivity on temperature measurement is demonstrated using sheets of different materials
Positioning	Visual demonstration of the influence on temperature measurement of camera positioning in relation to the target
Reflection and transmission	Visual demonstration of reflection and transmission phenomena and their influence
Spatial resolution	Detection of minimum areas for temperature measurement according to the distance from the target
Power supply	230 V – 50 / 60 Hz

CONTENTS

- C.A 1875 delivered in a bag with:
- 1 mains power cable
- Test sheets
- 1 booklet presenting the theoretical principles and practical exercises



ORITEL CF 204 GUNN power supply



ORITEL BDH R100 training bench



BDH R100

Ref. : P01275101



STRENGTHS

- Dedicated to teaching about 8.5 to 9.6 GHz microwaves with guided propagation
- WR90/R100 waveguide equipped with a quick mounting system
- Supplied with detailed course, teaching and lab work material
- Various accessories for setting up a wide range of experiments

SPECIFICATIONS

BDH R100	
Main possible experiments	
Study	GUNN oscillator
	Impedance
	Wavelength
Measurements	Frequency
	Standing wave ratio
Readings	Quadratic law of a detector

CONTENTS

- BDH R100 delivered in a case with:
- 1 ORITEL OSG 100 GUNN diode oscillator
- 1 ORITEL ISO 100 ferrite isolator
- 1 ORITEL MOD 100 PIN diode modulator
- 1 ORITEL ATM 100 variable attenuator
- 1 ORITEL OND 100 cavity wavemeter with curve
- 1 ORITEL LAF 100 measuring line
- 1 ORITEL ADZ 100/3 impedance adapter
- 1 ORITEL TGN 100 waveguide-to-coaxial transition element
- 1 ORITEL DEN 100 coaxial detector
- 1 ORITEL CHG 100 adapted load
- 1 ORITEL CC 100 short-circuit plate
- 3 ORITEL SUP 100 guide supports

ELEMENTS FOR FREE-SPACE PROPAGATION

		Reference
1	20 dB ANC 100/20 horn antenna	P01275326
2	15 dB ANC 100/15 dB horn antenna	P01275304
3	10 dB ANC 100/10 horn antenna	P01275325
4	RRL100 passive radar responder	P01275333
5	DR100 reflector disk	P01275334
6	AND100 dielectric antenna	P01275329
7	ASP100 patch antenna	P01275328
8	ANF100 adjustable slot antenna	P01275332
	ANF100F fixed slot antenna	P01275331
	IANF100 iris for adjustable slot antenna	P01275330
	ANP100 adjustable parabolic reflector	P01275327
9	ANP100F fixed parabolic reflector	P01275335



ADDITIONAL COMPONENTS

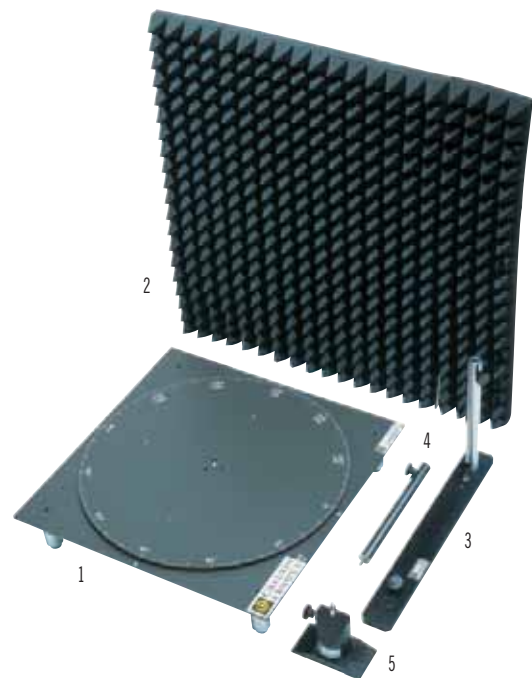
		Reference
1	ORITEL RD 100 displacement copy (for ORITEL LAF 100 measuring line)	P01275302
2	DPH100 micrometer phase shifter	P01275340
3	JTG100 rotating joint	P01275338
4	CIR100 ferrite circulator	P01275344
5	DEG100 parallel detector on guide	P01275345
6	PEH100 E-H positioner	P01275358
7	GD100/180 180 mm straight waveguide	P01275350
8	COE100/H high plane E bend	P01275346
	COE100/B low plane E bend	P01275347
	COH100 plane H bend	P01275348
9	CCM100 micrometer short-circuit	P01275351
10	Calibrated attenuator	P01275339
11	LAZ100 movable impedance adapter	P01275352
12	KED100 dielectric kit	P01275353
13	CDT100 multi-hole directional coupler	P01275341
	ICDT100/30: 30 dB iris for multi-hole coupler	P01275343
14	CAB100: 1 m coaxial cable	P01275357



ACCESSORIES / REPLACEMENT PARTS

		Reference
ORITEL OSG 100 GUNN diode oscillator	Voltage: 10 VDC - Power: +17 dBm	P01275307
ORITEL MOD 100 PIN diode modulator	Modulation depth > 50% for I = +10 mA	P01275309
ORITEL OND 100 cavity wavemeter with curve	Reading accuracy: 5 MHz	P01275311
ORITEL LAF 100 measuring line	Residual SWR: < 1.05	P01275312
ORITEL DEN 100 coaxial detector	SWR: < 1.3 - Max. power: +19 dBm	P01275315
ORITEL ISO 100 ferrite isolator	Isolation: > 20 dB	P01275308
ORITEL ATM 100 micrometer attenuator	Attenuation: > 20 dB - Max. power: 1 W average	P01275310
ORITEL ADZ 100/3 impedance adapter	Number of transverse plates: 3	P01275313
ORITEL TGN 100 waveguide-to-coaxial transition element	SWR: < 1.25	P01275314
ORITEL CHG 100 adapted load	SWR: < 1.05	P01275316
ORITEL CGX 100/20 dB cross coupler	Coupling: 20 dB - Directivity: 15 dB typ.	P01275305
IRIS 100 coupling iris (for CGX100)	20 and 30 dB coupling	P01275306
ORITEL ANC 100/15 dB horn antenna	Gain: 15 dB Flange: UBR 100/UG 39	P01275304
ORITEL AFR 100	Compatible with UBR 100 / UG 39 flanges	P01275301
ORITEL RD 100 displacement copy	For ORITEL LAF 100 measuring line	P01275302

* You are advised to use the GUNN CF204 power supply to power GUNN diode oscillators safely



ACCESSORIES / REPLACEMENT PARTS

		Reference
1	Manual rotating platform – PTM100	P01275359
2	Set of 2 absorbent panels – ABS100	P01275362
3	Antenna support – SAN100	P01275360
4	Antenna support rod	P01275349
5	Waveguide support – SUP100	P01275318
	Experiment frame	P01275361



CHOOSE YOUR TRAINING CASE



C.A 6710 case

page 211



Power & Harmonics Case

page 212

Electrical installation testing and safety

Earth/ground
Soil resistivity
Loop
Insulation
RCD
Leakage current



Power and Harmonics

Single & three-phase currents
Single & three-phase voltages
Active, reactive and apparent power, $\cos \phi$, PF...
single and three-phase
Voltage variation
Current variation
Current phase-shift variation
THD variation on voltage and current





C.A 6710

Ref.: P01145901

ELECTRICAL INSTALLATIONS

STRENGTHS

- Ideal for learning about electrical safety measurements
- Simulation of measurements on electrical installations
- Depressurization valve for air transport

SPECIFICATIONS

	C.A 6710
Standards illustrated	NF C 15-100, VDE 0100, IEE 16th, IEC 64-8, ÖVE EN-1, RBT MIE, NIN/NIV...
Simulation of earthing systems	TT, TN and IT
Measurement simulations	Earth, resistivity, loops (earth and internal), insulation, RCD tests (30 mA / 300 mA), current / leakage current
Fault simulations	Phase / neutral or earth interruptions, neutral / earth reversal, leakage current
Electrical safety	Cat. II 230 V
Dimensions	490 x 395 x 195 mm
Weight	10 kg

CONTENTS

- C.A 6710 delivered with:
- 1 x Schuko-type FR-DE mains power cable
- 6 black safety leads 25 cm long with rear connection
- 1 universal adapter for mains power sockets
- 1 FR/DE adapter for mains power sockets

ACCESSORIES / REPLACEMENT PARTS

- Set of 6 black Ø 4 male safety leads 25 cm long with rear connection P01295212
- 1 universal adapter for mains power sockets P01101980
- 1 FR/DE adapter for mains power sockets P01101981



POWER & HARMONICS

Ref.: P01NC5003

POWER AND HARMONICS

STRENGTHS

- Hazard-free simulation of a network and a three-phase load
- Variable currents, voltages, phase shift and THD

SPECIFICATIONS

	Power & harmonics
Network simulations	SINGLE or THREE--phase (230 V mains power supply)
Measurement simulations	U, I, W, W/h, var, φ , THD, etc.
Voltage	Mains $\pm 15\%$
Current	1, 2, 5, 10, 20 A $\pm 10\%$
Voltage variation*	+8% ; -10%
Current phase shift*	30°, 45°, 60° $\pm 5^\circ$ inductive or capacitive
Harmonic distortion on current and voltage*	Network level, 15 %, 25 % and variable
Phase outage	Yes
Power supply	230 V mains - 2 P + E socket
Electrical safety	IEC 61010 300 V Cat II pollution 2
Dimensions	490 x 395 x 195 mm
Weight	10 kg

*on phase 1

CONTENTS

- Case delivered with:
- 1 mains power cable

ACCESSORIES / REPLACEMENT PARTS

- Measurement leads page 220

ADDITIONAL INFO

- The current sensors are not delivered with the training case.



CHOOSE YOUR INSTRUMENT FOR SIMULATING THE ELECTRICAL QUANTITIES



C.A 401

C.A 402

C.A 403

C.A 404

C.A 405

C.A 406

DECADE BOXES

SHUNT

WHEATSTONE

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Specifications

AC / DC ammeter	■												
AC / DC voltmeter		■											
Null galvanometer			■										
Single/three-phase wattmeter				■	■								
Multimeter						■							
1-decade resistance box							■						
1-decade capacitance box								■					
Multi-decade resistance boxes									■				
Multi-decade capacitance boxes										■			
Multi-decade inductance boxes											■		
Shunts												■	
Wheatstone bridge (sub-assembly for)													■



ANALOGUE TESTERS



C.A 401 - C.A 402 - C.A 403

Ref.: P01170301 P01170302 P01170303

C.A 404 - C.A 405 - C.A 406

Ref.: P01170304 P01170305 P01170501



STRENGTHS

- Economical and rugged
- Resistant casing with removable stand
- Single switch
- Safety sockets
- Double insulation

CONTENTS

- C.A 401, C.A 402, C.A 403, C.A 404 and C.A 405 delivered with:
 - 1 x 1.5 V LR06 battery
- C.A 406 delivered with:
 - Test-probe leads
 - 1 x 1.5 V LR06 battery
- C.A 406 kit version P01170701

ACCESSORIES / REPLACEMENT PARTS

- Shockproof sheath no. 13 P01298016
- Fuses page 230
- Measurement leads page 230

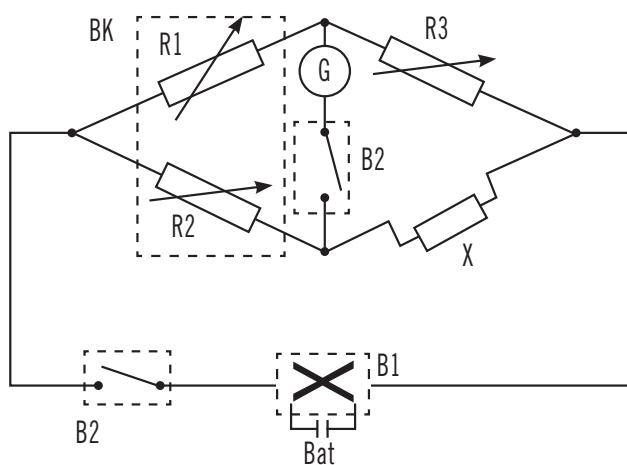
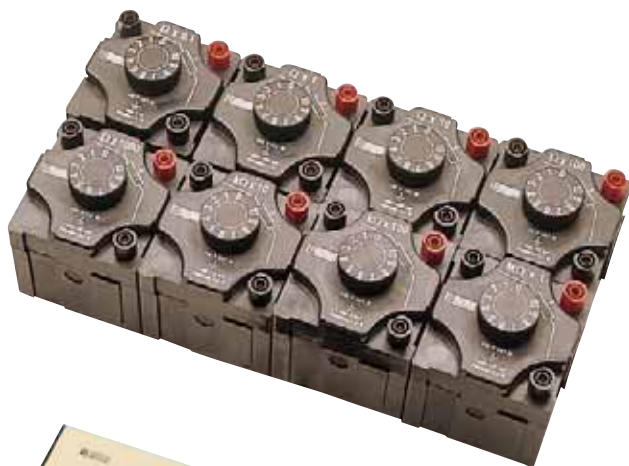
SPECIFICATIONS

	C.A 401	C.A 402	C.A 403	C.A 404	C.A 405	C.A 406
Function	AC/DC ammeter	AC/DC voltmeter	Null galvanometer 2 black scales (0 to 30 and 0 to 100)	Single-phase AC/DC wattmeter	Single and three-phase AC/DC wattmeter	Multimeter with 6 black, green and red scales
Switchgear	Magneto-electric rectifying		Magneto-electric	Ferrodynamic		Magneto-electric
Calibres	Voltage	100 mV DC cal. for shunts 8 DC cal.: 100 mV to 1,000 V* 6 AC cal.: 3 V to 1,000 V*	1 DC cal.: 100 mV for shunts	4 cal.: 60 V to 480 V	6 single-phase cal.: 60 V to 480 V 4 balanced three-phase cal.: 60 V $\sqrt{3}$ to 240 V $\sqrt{3}$	8 DC cal.: 100 mV to 1,000 V* 6 AC cal.: 3 V to 1,000 V*
	Current	11 DC cal.: 100 μ A to 10 A 7 AC cal.: 10 mA to 10 A	2 DC cal.: 30 μ A, 3 mA	2 cal.: 0,5 A; 1 A	1 cal. 5 A	4 DC cal.: 1 mA to 1 A & 1 cal. 50 μ A 5 AC cal.: 0.3 mA to 3 A & 1 cal. 150 μ A
	Resistance					3 cal.: 0.5 Ω 1 k Ω to 1 M Ω
Basic accuracy	2 % DC 2,5 % AC		1,5 % DC	1 % AC	2,5 % DC. 1 % AC mono. et 2 % AC tri.	1,5 % DC
Operating frequency	45 to 400 Hz	20 to 400 Hz		0 to 500 Hz	15 to 500 Hz	20 to 400 Hz
Fuses	1 A HPC and 10 A HPC	Internal resistance: 20 k Ω /V _{DC} ; 6.32 k Ω /V _{AC}	315 mA HPC	1,25 A HPC	6,3 A HPC	3.15 A HRC and 160 mA HRC int. res.: 20 k Ω /V _{DC} ; 6.32 k Ω /V _{AC}
Electrical safety	600 V CAT III as per IEC/EN 61010-1 Edition 2					
Dimensions	165 x 105 x 50 mm					
Weight	450 g					

*Use limited to 600 V maximum



DECADE BOXES AND SHUNTS



G = null galvanometer

BK = K ratio box - with $K = \frac{R2}{R1}$

R3 = resistance boxes

X = resistance to be measured - with $X = K \times R3$

B1 = simple changeover-switch box

B2 = dual switch box

Bat = battery

RESISTANCE BOXES

	References
1 decade	
0,1 to 1 Ω	P03197521A
1 to 10 Ω	P03197522A
10 to 100 Ω	P03197523A
100 to 1,000 Ω	P03197524A
1 to 10 k Ω	P03197525A
10 to 100 k Ω	P03197526A
100 to 1,000 k Ω	P03197527A
1 to 10 M Ω	P03197528A
BR 04 :	4 decades 1 Ω to 10 k Ω
BR 05 :	5 decades 1 Ω to 100 k Ω
BR 06 :	6 decades 1 Ω to 1 M Ω
BR 07 :	7 decades 1 Ω to 10 M Ω
	P01197401
	P01197402
	P01197403
	P01197404

CONTENTS

- 1-decade box delivered with 1 black safety lead 25 cm long, \varnothing 4 mm male with rear connection
- BR 04/05/06/07 boxes are delivered with a user manual only.

ACCESSORIES / REPLACEMENT PARTS

- 1 black safety lead 25 cm long, \varnothing 4 mm male with rear connection P01295056
- Black \varnothing 4 mm male jumper (x10) P01101892A

ASSEMBLY FOR WHEATSTONE BRIDGE

	References
7-ratio K box	P03197531A
Null galvanometer	P03197611A
Dual switch box	P03197529A
Simple changeover-switch box	P03197530A

IEC/EN6110-1 - 150 V CAT II - Pol 2
50 V CAT III



DECADE BOXES AND SHUNTS



CAPACITANCE BOXES

STRENGTHS

Elements for mechanical and electrical assemblies

- Selection by rotary switch with contacts
- Typical accuracy: 2%

1-decade boxes

- 3 boxes with 11-position switch (including position 0)
- 2 safety terminals \varnothing 4mm and one earth terminal
- Dimensions: 72x72x90 mm

5-decade box

- Polystyrene and polypropylene high-accuracy capacitors with a temperature coefficient of 125 ppm/°C and a very high insulation resistance
- Output: \varnothing 4mm safety sockets
- Metal front panel and casing connected to a safety earth socket with foolproofing

	References
1 decade	
0.01 to 0.1 μ F	P03199613A
0.1 to 1 μ F	P03199612A
1 to 10 μ F	P03199611A
BC 05 : 5 decades 0.1 nF to 10 μ F	P01197421

CONTENTS

- 1-decade box delivered with:
- 1 black safety lead 25 cm long, \varnothing 4 mm male with rear connection
- BC05 box delivered with a user manual only.

ACCESSORIES / REPLACEMENT PARTS

- 1 black safety lead 25 cm long, \varnothing 4 mm male with rear connection P01295056
- Black \varnothing 4 mm male jumper (x10) P01101892A

IEC/EN6110-1 - 150 V CAT II - Pol 2
50 V CAT III



DECADE BOXES AND SHUNTS

INDUCTANCE BOXES



BL 07 : 7 decades from 1 μ H to 10 H

References

P01197451

CONTENTS

- BL07 box delivered with a user manual only



100 MV SAFETY SHUNTS IN DOUBLE-INSULATED CASING

STRENGTHS

- 4-wire measurement
- Red "current" terminals
- Black "voltage" terminals

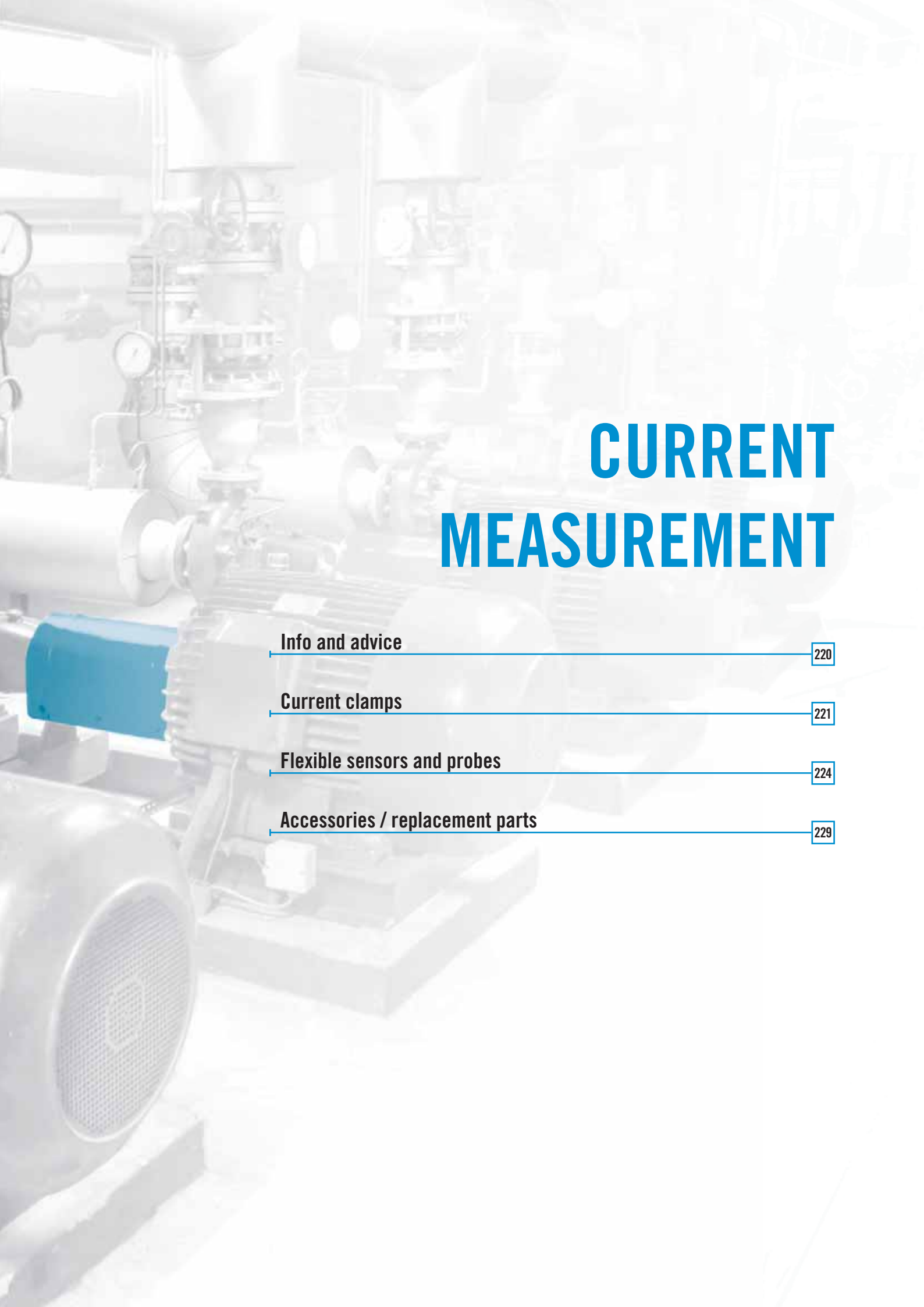
	References
1 A	P01165221
5 A	P01165222
10 A	P01165223
20 A	P01165224
30 A	P01165225

CONTENTS

- Shunt delivered with a user manual only

**IEC/EN6110-1 - 150 V CAT II - Pol 2
50 V CAT III**



The background of the page is a faded, high-angle photograph of industrial machinery. It features various pipes, valves, gauges, and large cylindrical components, possibly part of a water treatment or manufacturing system. The overall tone is light and technical.

CURRENT MEASUREMENT

Info and advice

220

Current clamps

221

Flexible sensors and probes

224

Accessories / replacement parts

229



CHOOSING YOUR CURRENT CLAMP

There is a wide range of criteria for choosing a current clamp. The approach below is designed to help define your requirements and guide you naturally towards the model which best suits your application. The criteria selected are classified from 1 to 6.

To choose your clamp, we advise you to follow this logic:

- Measurement of direct or alternating current?
 - ➔ AC/DC clamps table or AC clamps table
- High or low currents?
 - ➔ see the “Input” column to define the appropriate families of clamps
- On small wires or large cables?
 - ➔ see the diagrams at the bottom of the next page and only choose families with the shapes and dimensions required
- What instrument will it be connected to?
 - ➔ see “Output / Connection” column to choose a clamp with compatible signal and connection possibilities
- What are your other criteria?
 - ➔ see “Specific features” column to check that the clamp chosen fulfils your requirements perfectly



THE WIDEST RANGE OF IEC 61010-2-032 CLAMPS

Our innovation, technical expertise and determination to manufacture top-quality products that comply with standards have made Chauvin Arnoux the worldwide specialist in current clamps.

On the next pages, you will find a table presenting the clamps for measuring AC/DC current, followed by a diagram giving the clamp form with dimensions and then another table grouping a large number of models for AC current.

As a result of their specifications, certain clamps are specialized for specific applications:

- Clamps for oscilloscopes (BNC output): E3N, PAC12, PAC22, MN60, Y7N, C160, D38N and MA200
- Clamps for leakage currents: MN73, C173 and B102
- Process current clamps: K1 and K2
- Clamp for measurement on the secondary windings of current transformers: MN71



As well as these standard specialized and unspecialized models, “specific” versions can also be produced on request: please ask for details.

CHOOSE YOUR CURRENT CLAMP

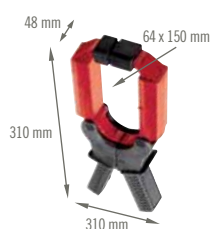
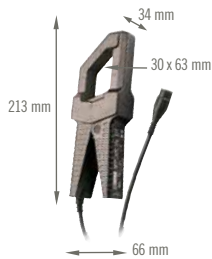
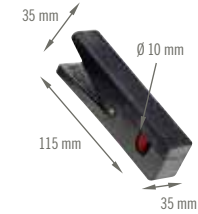









	MINI	MN	YN	C1XX	DN	BXX	MiniFlex® MA110 Series	MiniFlex® MA130 Series	MiniFlex® MA200 Series	AmpFlex® A110 Series	AmpFlex® A130 Series	K	EN	PAC 1X	PAC 2X
	page 222	page 222	page 222	page 222	page 222	page 222	page 224	page 224	page 224	page 226	page 226	page 223	page 223	page 223	page 223
For current															
Clamping Ø mm)	10	20	30	52	64	115	45 70 100	70	45 70 100	140 250 380	250	3,9	8	30	42
AC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
DC												■	■	■	■
Min	5 mA	10 mA	1 A	1 mA	100 mA	500 µA	80 mA	500 mA	500 mA	80 mA	500 mA	100 µA	5 mA	200 mA	200 mA
MAX	150 A	240 A	600 A	1200 A	3600 A	400 A	3000 A	3000 A	3000 A	30000 A	3000 A	4,5 A	150 A	600 A	1000 A
Output															
in mA _{AC}	■	■	■	■	■										
in mV _{AC}	■	■	■	■	■	■	■	■	■	■	■				
in mV _{DC}	■	■	■												
in mV _{AC+DC}												■	■	■	■
Connections															
Insulated Ø 4 mm sockets		■		■	■										
Lead with insulated elbowed Ø 4 mm male plugs	■	■	■	■	■	■	■			■			■	■	■
Insulated Ø 4 mm plug box with standard 19 mm spacing												■			
Coaxial cable with insulated male BNC		■	■	■	■			■	■		■		■	■	■
Single-calibre	■	■	■	■	■				■					■	■
Multi-calibre	■	■		■	■	■	■	■	■	■	■	■	■	■	■
For multimeters	■	■	■	■	■	■	■	■		■	■	■	■	■	■
For oscilloscopes		■	■	■	■				■				■	■	■
For detecting leaks and insulation faults		■		■		■									
For measuring power values, harmonics, etc.	■	■		■	■		■	■		■	■		■	■	■
For the process and the 4-20/0-20 mA measurement loop												■			
Power supply															
Self-contained	■	■	■	■	■	■									
9 V battery							■	■	■	■	■	■	■	■	■
Mains adapter							■	■	■	■	■	■	■	■	■



CURRENT MEASUREMENT

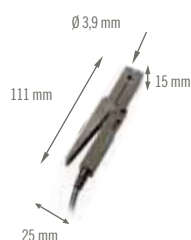
AC CURRENT MEASUREMENT







		Input					Output - Connections					Specific features								
		Measurement range ⁽¹⁾																		
		Very low current	Low current	Medium current	High current	Alternating current	Direct current													
Series	Model							Current	Voltage	Lead + safety plugs ø 4 mm	Female sockets ø 4 mm	BNC connector (coaxial)	Transformation ratio (input/output)	Output protected against overvoltages	Automatic DC zero	Power measurement (low phase shift)	Bandwidth (frequency in Hz)	Typical accuracy	Reference	
	MINI 01	2 to 150 A						0.15 A _{AC}					1,000/1				48 Hz...500 Hz	≤ 2.5%	P01105101Z	
	MINI 02	50 mA to 100 A						0.15 A _{AC}					1,000/1				48 Hz...10 kHz	≤ 1%	P01105102Z	
	MINI 03	1 to 100 A							0.1 V _{AC}				1 A / 1 mV					≤ 2%	P01105103Z	
	MINI 05	5 mA to 10 A 1 to 100 A							10 V _{AC} 0.1 V _{AC}				1 mA / 1 mV 1 A / 1 mV				48 Hz...500 Hz	≤ 3% ≤ 2%	P01105105Z	
	MINI 09	1 to 150 A							15 V _{DC} ⁽²⁾				1 A / 100 mV					≤ 4%	P01105109Z	
	MN08		0.5 to 240 A					0.2 A _{AC}					1,000/1				40 Hz...10 kHz	≤ 1%	P01120401	
	MN09		0.5 to 240 A					0.2 A _{AC}					1,000/1					≤ 1%	P01120402	
	MN10		0.5 to 240 A					0.2 A _{AC}					1,000/1					≤ 2%	P01120403	
	MN11		0.5 to 240 A					0.2 A _{AC}					1,000/1					≤ 2%	P01120404	
	MN12		0.5 to 240 A						2 V _{AC}				1 A / 10 mV					≤ 1%	P01120405	
	MN13		0.5 A to 240 A						2 V _{AC}				1 A / 10 mV					≤ 1%	P01120406	
	MN14		0.5 A to 240 A						0.2 V _{AC}				1 A / 1 mV					≤ 1%	P01120416	
	MN15		0.5 A to 240 A						0.2 V _{AC}				1 A / 1 mV					≤ 1%	P01120417	
	MN21		0.1 A to 240 A					0.2 A _{AC}					1,000/1					≤ 2%	P01120418	
	MN23		0.1 A to 240 A						2 V _{AC}				1 A / 10 mV					≤ 1.5%	P01120419	
	MN38		0.1 A to 24 A 0.5 A to 240 A						2 V _{AC} 2 V _{AC}				1 A / 100 mV 1 A / 10 mV					≤ 1%	P01120407	
	MN39		0.1 A to 24 A 0.5 A to 240 A						2 V _{AC} 2 V _{AC}				1 A / 100 mV 1 A / 10 mV					≤ 1%	P01120408	
	MN60		0.1 A to 60 Apeak 0.5 A to 600 Apeak						6 Vpeak 6 Vpeak				1 A / 100 mV 1 A / 10 mV					40 Hz...40 kHz	≤ 2% ≤ 1.5%	P01120409
	MN71		10 mA to 12 A						1 V _{AC}				1 A / 100 mV					40 Hz...10 kHz	≤ 1%	P01120420
	MN73		10 mA to 2.4 A 100 mA to 240 A						2 V _{AC} 2 V _{AC}				1 mA / 1 mV 1 A / 10 mV						≤ 1% ≤ 2%	P01120421
MN88		0.5 A to 240 A						20 V _{DC} ⁽²⁾				1 A / 100 mV				≤ 2%	P01120410			
MN89		0.5 A to 240 A						20 V _{DC} ⁽²⁾				1 A / 100 mV				≤ 2%	P01120415			
	Y1N		4 A to 500 A					0.5 A _{AC}					1,000/1				48 Hz...1 kHz	≤ 3%	P01120001A	
	Y2N		4 A to 500 A					0.5 A _{AC}					1,000/1					≤ 1%	P01120028A	
	Y3N		4 A to 500 A					5 A _{AC}					100/1					≤ 3%	P01120029A	
	Y4N		4 A to 500 A						0.5 V _{DC} ⁽²⁾				500 A / 0.5 V					≤ 1%	P01120005A	
	Y7N		1 A to 1,200 Apeak						1.2 Vpeak				1 A / 1 mV					≤ 2%	P01120075	
	C100		0.1 A to 1,200 A					1 A _{AC}					1,000/1				30 Hz...10 kHz	≤ 0.5%	P01120301	
	C102		0.1 A to 1,200 A					1 A _{AC}					1,000/1					≤ 0.5%	P01120302	
	C103		0.1 A to 1,200 A					1 A _{AC}					1,000/1					≤ 0.5%	P01120303	
	C106		0.1 A to 1,200 A						1 V _{AC}				1 A / 1 mV					≤ 0.5%	P01120304	
	C107		0.1 A to 1,200 A						1 V _{AC}				1 A / 1 mV					≤ 0.5%	P01120305	
	C112		1 mA to 1,200 A					1 A _{AC}					1,000/1					≤ 0.3%	P01120314	
	C113		1 mA to 1,200 A					1 A _{AC}					1,000/1					≤ 0.3%	P01120315	
	C116		1 mA to 1,200 A						1 V _{AC}				1 A / 1 mV					≤ 0.3%	P01120316	
	C117		1 mA to 1,200 A						1 V _{AC}				1 A / 1 mV					≤ 0.3%	P01120317	
	C122		1 A to 1,200 A					5 A _{AC}					1,000/5					≤ 1%	P01120306	
	C148		1 A to 300 A 1 A to 600 A 1 A to 1,200 A					5 A _{AC}					250/5 500/5 1,000/5				48 Hz...1 kHz	≤ 2% ≤ 1% ≤ 1%	P01120307	
	C160		0.1 A to 30 Apeak 0.1 A to 300 Apeak 1 A to 2,000 Apeak						3 Vpeak 3 Vpeak 2 Vpeak				10 A / 1 V 100 A / 1 V 1,000 A / 1 V				10 Hz...100 kHz	≤ 3% ≤ 2% ≤ 1%	P01120308	
	C173		1 mA to 1.2 A 0.01 A to 12 A 0.1 A to 120 A 1 A to 1,200 A						1 V _{AC}				1 A / 1 V 10 A / 1 V 100 A / 1 V 1,000 A / 1 V				10 Hz...3 kHz	≤ 0.7% ≤ 0.5% ≤ 0.3% ≤ 0.2%	P01120309	
	B102		500 µA to 4 A 0.5 A to 400 A						4 V _{AC} 0.4 V _{AC}				1 mA / 1 mV 1 A / 1 mV				10 Hz...1 kHz	≤ 0.5% ≤ 0.35%	P01120083	
	D30N		1 A to 3,600 A					1 A _{AC}					3,000/1				30 Hz...5 kHz	≤ 0.5%	P01120049A	
	D30CN		1 A to 3,600 A					1 A _{AC}					3,000/1					≤ 0.5%	P01120064	
	D31N		1 A to 600 A 1 A to 1,200 A 1 A to 1,800 A					1 A _{AC}					500/1 1,000/1 1,500/1					30 Hz...1.5 kHz	≤ 3% ≤ 1% ≤ 0.5%	P01120050A
	D32N		1 A to 1,200 A 1 A to 2,400 A 1 A to 3,600 A					1 A _{AC}					1,000/1 2,000/1 3,000/1					30 Hz...1 kHz	≤ 1% ≤ 0.5% ≤ 0.5%	P01120051A
	D33N		1 A to 3,600 A					5 A _{AC}					3,000/5					30 Hz...5 kHz	≤ 1%	P01120052A
	D34N		1 A to 600 A 1 A to 1,200 A 1 A to 1,800 A					5 A _{AC}					500/5 1,000/5 1,500/5					30 Hz...1.5 kHz	≤ 3% ≤ 1% ≤ 0.5%	P01120053A
	D35N		1 A to 1,200 A 1 A to 2,400 A 1 A to 3,600 A					5 A _{AC}					1,000/5 2,000/5 3,000/5						≤ 1% ≤ 0.5% ≤ 0.5%	P01120054A
	D36N		1 A to 3,600 A					3 A _{AC}					3,000/3						≤ 0.5%	P01120055A
	D37N		0.1 A to 36 A 1 A to 360 A 1 A to 3,600 A						3 V _{AC}				30 A/3 V 300 A/3 V 3,000 A/3 V						30 Hz...5 kHz	≤ 2%
	D38N		1 A to 90 Apeak 1 A to 900 Apeak 1 A to 9,000 Apeak						0.9 V peak				1 A / 10 mV 1 A / 1 mV 1 A / 0.1 mV					30 Hz...50 kHz	≤ 2%	P01120057A

(1) The upper value corresponds to 120 % of the max. rated value. (2) Reshaping of AC signal by diodes.

AC/DC CURRENT MEASUREMENT



	Series	Model	Input					Output - Connections					Specific features					Reference	
			Measurement range(1)					Current	Voltage	Lead + safety plugs ø 4 mm	Female sockets ø 4 mm	BNC connector (coaxial)	Transformation ratio (input/output)	Output protected against overvoltages	Automatic DC zero	Power measurement (low phase shift)	Bandwidth (frequency in Hz)		Typical accuracy
Very low current	Low current	Medium current	High current	Alternating current	Direct current														
	K1	1 mA to 4.5 Aac 1 mA to 3 A RMS 1 mA to 4.5 Apeak						4.5 V _{AC} 3 V _{RMS} 4.5 V _{peak}	(2)			1 mA / 1 mV				DC...2 kHz	≤ 1%	P01120067A	
	K2	100 µA to 450 mAc 100 µA to 300 mAc 100 µA to 450 mAc						4.5 V _{AC} 3 V _{RMS} 4.5 V _{peak}	(2)			1 mA / 10 mV				DC...1.5 kHz	≤ 1%	P01120074A	
	E1N		0.05 A to 2 A _{AC} 0.05 A to 1.5 A _{AC} 0.5 A to 150 A _{AC/bc}					2 V _{DC} 1.5 V _{AC} 150 mV AC/DC				1 A / 1 V 1 A / 1 mV				DC... 2 kHz DC... 8 kHz	≤ 2% ≤ 1.5%	P01120030A	
	E3N	0.05 A to 10 A _{peak} 0.05 A to 10 A _{AC} 1 A to 100 A _{peak} 1 A to 100 A _{AC}						1 V _{peak} or DC				1 A / 100 mV 1 A / 10 mV				DC...100 kHz	≤ 3% ≤ 4%	P01120043A	
	E6N	5 mA to 2 A _{AC} 5 mA to 1.5 A _{AC} 20 mA to 80 A _{AC/bc}						2 V _{DC} 1.5 V _{AC} 0.8 V _{AC/bc}				1 A / 1 V 1 A / 10 mV				DC... 2 kHz DC... 8 kHz	≤ 2% ≤ 4%	P01120040A	
	PAC10		0.5 A to 400 A _{AC} 0.5 A to 600 A _{AC}					600 mV _{AC/bc}				1 A / 1 mV				DC...5 kHz	≤ 2%	P01120070	
	PAC11		0.2 A to 40 A _{AC} 0.4 A to 60 A _{AC} 0.5 A to 400 A _{AC} 0.5 A to 600 A _{AC}						600 mV _{AC/bc}				1 A / 10 mV 1 A / 1 mV				DC...10 kHz	≤ 1.5% ≤ 2%	P01120068
	PAC12		0.2 A to 60 A _{peak} 0.4 A to 60 A _{AC} 0.5 A to 600 A _{peak} 0.5 A to 600 A _{AC}						600 mV _{peak} or DC				1 A / 10 mV 1 A / 1 mV				DC...10 kHz	≤ 1.5% ≤ 2%	P01120072
	PAC20		0.5 A to 1,000 A _{AC} 0.5 A to 1,400 A _{AC}					1.4 V AC/DC				1 A / 1 mV				DC...5 kHz	≤ 2%	P01120071	
	PAC21		0.2 A to 100 A _{AC} 0.4 A to 150 A _{AC} 0.5 A to 1,000 A _{AC} 0.5 A to 1,400 A _{AC}						1.4 V _{AC/bc}				1 A / 10 mV 1 A / 1 mV				DC...10 kHz	≤ 1.5% ≤ 2.5%	P01120069
	PAC22		0.2 A to 150 A _{peak} 0.4 A to 150 A _{AC} 0.5 A to 1,400 A _{peak} 0.5 A to 1,400 A _{AC}						1.5 V _{peak} or DC 1.4 V _{peak} or DC				1 A / 10 mV 1 A / 1 mV				DC...10 kHz	≤ 1.5% ≤ 2.5%	P01120073

(1) The upper value corresponds to 120 % of the max. rated value. (2) Cable + electronic unit with ø 4 mm safety plugs and 19 mm spacing for the K Series



MiniFlex® FLEXIBLE PROBES FOR AC CURRENT



MA110 - MA130 - MA200

600 V
CAT IV1000 V
CAT III

80 mA

3 kAac

4
calibresIP
67

STRENGTHS

- Flexible sensor comprising an active part (Rogowski coil) and a unit containing electronics
- For multimeters, loggers, oscilloscopes, etc.
- No magnetic saturation constraints: excellent linearity, low phase shift, wide dynamic range for measurement
- Flexibility of the sensors for easier clamping of the conductor to be measured
- Compact instruments which are easy to position in residential or industrial electrical cabinets
- Click system for opening and closing the core even when handling with safety gloves

ADDITIONAL INFO

MA110 model

- Measurement from 80 mA
- Can be connected to the AC voltage input (mVAC / VAC) of any multimeter or measuring instrument equipped with Ø 4 mm female banana plugs
- Can be powered by batteries or via a standard external power supply
- Equipped with an automatic power-off system which can be deactivated at start-up to perform long-duration measurement campaigns
- Possesses 3 LEDs (green, yellow and orange) indicating, respectively, the power-supply status, status of the automatic power-off function and measurement capacity overruns

Three-phase MA130 model

- Can be connected to the AC voltage inputs (mVAC / VAC) of any power analyser, logger or measuring instrument equipped with BNC plugs

Three-phase MA200 model

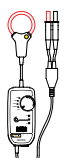
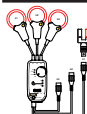

- Equipped with a BNC output and can be connected to all types of oscilloscopes
- Offers high bandwidth
- Particularly suitable for viewing transient signals, command signals, tripping currents of thyristors or the output signal from an electronic power supply

CONTENTS

- MA110 delivered with 2 x 1.5V LR6 alkaline batteries, 1 safety datasheet, 1 verification certificate
- MA130 with 2 x 1.5V LR6 alkaline batteries, 1 safety datasheet, 1 verification certificate, 1 set of coloured rings for cable foolproofing/identification, 3 female BNC / Ø 4 mm male plug adapters
- MA200 delivered with one 9 V battery, 1 verification certificate



MiniFlex® FLEXIBLE PROBES FOR AC CURRENT

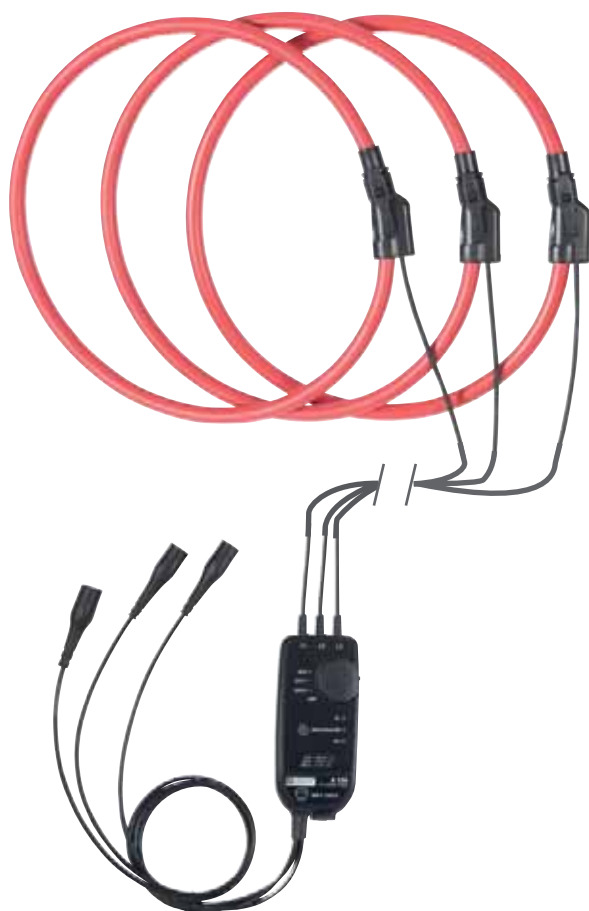
Series	Model	Input						Output - Connections					Specific features					Reference	
		Measurement range ⁽¹⁾						Current	Voltage	Lead + safety plugs ø 4 mm	Female sockets ø 4 mm	BNC connector (coaxial)	Transformation ratio (input/output)	Output protected against overvoltages	Automatic DC zero	Power measurement (low phase shift)	Bandwidth (frequency in Hz)		Typical accuracy
		Very low current	Low current	Medium current	High current	Alternating current	Direct current												
	MA110 3-30-300-3000/3 (17 cm / Ø 4.5 cm)	0.08 A - 3 A 0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A							3 Vac	(2)			1 V/A 100 mV/A 10 mV/A 1 mV/A			10 Hz .. 10 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120660	
	MA110 3-30-300-3000/3 (25 cm / Ø 7 cm)	0.08 A - 3 A 0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A							3 Vac	(2)			1 V/A 100 mV/A 10 mV/A 1 mV/A			10 Hz .. 10 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120661	
	MA110 3-30-300-3000/3 (35 cm / Ø 10 cm)	0.08 A - 3 A 0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A							3 Vac	(2)			1 V/A 100 mV/A 10 mV/A 1 mV/A			10 Hz .. 10 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120662	
	MA130 30-300-3000/3 (25 cm / Ø 7 cm)	0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A							3 Vac				100 mV/A 10 mV/A 1 mV/A			10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120663	
	MA200 30-300/3 (17 cm / Ø 4.5 cm)		0.5 A .. 45 A _{PEAK} 0.5 A .. 450 A _{PEAK}					4.5 V _{PEAK}				100 mV/A 10 mV/A					≤ 1% + 0.3 A	P01120570	
	MA200 30-300/3 (25 cm / Ø 7 cm)		0.5 A .. 45 A _{PEAK} 0.5 A .. 450 A _{PEAK}					4.5 V _{PEAK}				100 mV/A 10 mV/A				5 Hz .. 1 MHz	≤ 1% + 0.3 A	P01120571	
	MA200 3000 / 3 (35 cm / Ø 10 cm)		5 A .. 4,500 A _{PEAK}					4.5 V _{PEAK}				1 mV/A					≤ 1% + 0.3 A	P01120572	

(1) The upper value corresponds to 120 % of the max. rated value. (2) Cable + electronic unit with ø 4 mm safety plugs and 19 mm spacing.



CURRENT MEASUREMENT

AmpFlex® FLEXIBLE PROBES FOR AC CURRENT



CONTENTS

- **A110** delivered with 2 x 1.5V LR6 alkaline batteries, 1 safety datasheet, 1 verification certificate
- **A130** delivered with 2 x 1.5V LR6 batteries, 1 datasheet, 1 verification certificate, 1 set of coloured rings for cable foolproofing/identification, 3 female BNC/Ø 4 mm male plug adapters

A110 - A130

1000 V
CAT IV

80 mA

30 kAac

IP
67

4
calibres

STRENGTHS

- Flexible sensor comprising an active part (Rogowski coil) and a unit containing electronics
- For multimeters, loggers, oscilloscopes, etc.
- No magnetic saturation constraints: excellent linearity, low phase shift, wide dynamic range for measurement
- Flexibility of the sensors for easier clamping of the conductor to be measured
- Compact instruments which are easy to position in residential or industrial electrical cabinets
- Click system for opening and closing the core even when handling with safety gloves

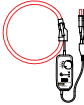
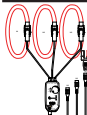
ADDITIONAL INFO

A110 model

- Measures from 80 mA
- Can be connected to the AC voltage input (mVAC / VAC) of any multimeter or measuring instrument equipped with Ø 4 mm female banana plugs
- Can be powered by batteries or via a standard external power supply
- Equipped with an automatic power-off system which can be deactivated at start-up to perform long-duration measurement campaigns
- Possesses 3 LEDs (green, yellow and orange) indicating, respectively, the power-supply status, status of the automatic power-off function and measurement capacity overruns

Three-phase A130 model






- Can be connected to the AC voltage inputs (mVAC / VAC) of any power analyser, logger or measuring instrument equipped with BNC plugs

Series	Model	Input					Output - Connections					Specific features					Reference		
		Measurement range(1)																	
		Very low current	Low current	Medium current	High current	Alternating current	Direct current	Current	Voltage	Lead + safety plugs ø4 mm	Female sockets ø4 mm	BNC connector (coaxial)	Transformation ratio (input/output)	Output protected against overvoltages	Automatic DC zero	Power measurement (low phase shift)	Bandwidth (frequency in Hz)	Typical accuracy	
	A110 3-30-300-3,000/3 (45 cm / Ø 14 cm)		0.08 A - 3 A 0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A						3 Vac	(2)			1 V/A 100 mV/A 10 mV/A 1 mV/A				10 Hz .. 10 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120630
	A110 3-30-300-3,000/3 (80 cm / Ø 25 cm)		0.08 A - 3 A 0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A						3 Vac	(2)			1 V/A 100 mV/A 10 mV/A 1 mV/A				10 Hz .. 10 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120631
	A110 30-300-3000-30,000/3 (120 cm / Ø 38 cm)			0.5 A - 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A 0.5 A .. 30,000 A						3 Vac	(2)			100 mV/A 10 mV/A 1 mV/A 0.1 mV/A				10 Hz .. 5 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%
	A130 30-300-3,000/3 (80 cm / Ø 25 cm)		0.5 A .. 30 A 0.5 A .. 300 A 0.5 A .. 3,000 A						3 Vac				100 mV/A 10 mV/A 1 mV/A				10 Hz .. 20 kHz 10 Hz .. 20 kHz 10 Hz .. 20 kHz	≤ 1%	P01120633

(1) The upper value corresponds to 120 % of the max. rated value. (2) Cable + electronic unit with Ø 4 mm safety plugs and 19 mm spacing.

SPECIFIC SENSORS FOR DEDICATED APPLICATIONS



		Input						Output - Connections						Specific features						
		Measurement range(1)																		
Series	Model	Very low current	Low current	Medium current	High current	Alternating current	Direct current	Current	Voltage	Lead + safety plugs ø 4 mm	Female sockets ø 4 mm	Female sockets ø 4 mm	Transformation ratio (input/output)	Output protected against overvoltages	Automatic DC zero	Power measurement (low phase shift)	Bandwidth (frequency) in Hz	Typical accuracy	Reference	
LEAKAGE CURRENT MEASUREMENT																				
	MN73	10mA to 2.4 A 100 mA to 240 A							2 Vac 2 Vac				1 A / 1,000 mV 1 A / 10 mV				40 Hz to 10 kHz	≤ 1% ≤ 2%	P01120421	
	C173	1 mA to 1.2 A 0.01 A to 12 A 0.1 A to 120 A 1 A to 1,200 A							1 Vac				1 A / 1 V 10 A / 1 V 100 A / 1 V 1,000 A / 1 V				10 Hz to 3 kHz	≤ 0.7% ≤ 0.3% ≤ 0.5% ≤ 0.2%	P01120309	
	B102	500 µA to 4 A 0.5 A to 400 A							4 Vac 0.4 Vac				1 mA / 1 mV 1 A / 1 mV				10 Hz to 1 kHz	≤ 0.5% ≤ 0.35%	P01120083	
PROCESS CURRENT MEASUREMENT																				
	K1	1 mA to 4.5 A _{DC} 1 mA to 3 A _{RMS} 1 mA to 4.5 A _{PEAK}					(2)		4.5 V _{DC} 3 V _{RMS} 4.5 V _{PEAK}				1 mA / 1 mV				DC to 2 kHz	≤ 1%	P01120067A	
	K2	100 µA to 450 mA _{DC} 100 µA to 300 mA _{RMS} 100 µA to 450 mA _{PEAK}					(2)		4.5 V _{DC} 3 V _{RMS} 4.5 V _{PEAK}				1 mA / 10 mV				DC to 1.5 kHz	≤ 1%	P01120074A	
MEASUREMENT ON CURRENT TRANSFORMER SECONDARY																				
	MN71	10 mA to 12 A							1 Vac				1 A / 100 mV				40 Hz to 10 kHz	≤ 1%	P01120420	

(1) The upper value corresponds to 120 % of the max. rated value. (2) Cable + electronic unit with Ø 4 mm safety plugs and 19 mm spacing.

Please contact us for models with specific sensitivities (mV/A) and/or lengths. We can also supply bare sensors for integration into assemblies including the signal-processing electronics.



CURRENT MEASUREMENT




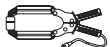
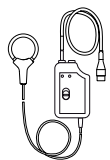



CURRENT PROBES FOR OSCILLOSCOPES

ADDITIONAL INFO

- View the currents in total safety without opening the circuit!
- Capture the signal simply by clamping the conductor

600 V
CAT III

IEC
61010-2-32

		Input						Output - Connections					Specific features							Reference
		Measurement range(1)						Current	Voltage	Lead + safety plugs ø 4 mm	Female sockets ø 4 mm	BNC connector (coaxial)	Transformation ratio (input/output)	Output protected against overvoltages	Automatic DC zero	Power measurement (low phase shift)	Bandwidth (frequency in Hz)	Typical accuracy		
Series	Model	Very low current	Low current	Medium current	High current	Alternating current	Direct current													
MEASUREMENT ON OSCILLOSCOPE																				
	MN60		0.1 A to 60 A _{PEAK} 0.5 A to 600 A _{PEAK}						6 V _{PEAK}				1 A / 100 mV 1 A / 10 mV				40 Hz to 40 kHz	≤ 2% ≤ 1.5%	P01120409	
	Y7N		1 A to 1,200 A _{PEAK}						1.2 V _{PEAK}				1 mA / 1 mV				5 Hz to 10 kHz	≤ 2%	P01120075	
	C160		0.1 A to 300 A _{PEAK} 1 A to 300 A _{PEAK} 1 A to 2,000 A _{PEAK}						3 V _{PEAK} 3 V _{PEAK} 2 V _{PEAK}				10 A / 1 V 100 A / 1 V 1,000 A / 1 V				10 Hz to 100 kHz	≤ 3% ≤ 2% ≤ 1%	P01120308	
	D38N		1 A to 90 A _{PEAK} 1 A to 900 A _{PEAK} 1 A to 9,000 A _{PEAK}						0.9 V _{PEAK}				1 A / 10 V 1 A / 1 mV 1 A / 0.1 mV				30 Hz to 50 kHz	≤ 2%	P01120057A	
	MA200 30-300/3 (17 cm)		0.5 A...45 A _{PEAK} 0.5 A...450 A _{PEAK}						4.5 V _{PEAK}				100 mV/A 10 mVA				5 Hz...1 MHz	≤ 1% + 0.3 A	P01120570	
	MA200 30-300/3 (25 cm)		0.5 A...45 A _{PEAK}						4.5 V _{PEAK}				100 mV/A 10 mVA					≤ 1% + 0.3 A	P01120571	
	MA200 3000/3 (35 cm)		5 A...4,500 A _{PEAK}						4.5 V _{PEAK}				1 mV/A					≤ 1% + 0.3 A	P01120572	
	E3N		0.05 A to 10 A _{PEAK} 1 A to 100 A _{PEAK}						1 V _{PEAK}				1 A / 10 mV 1 A / 1 mV				DC to 10 kHz	≤ 3% ≤ 4%	P01120043A P01120047*	
	PAC12		0.2 A to 60 A _{PEAK} 0.4 A to 60 A _{DC} 0.5 A to 600 A _{PEAK} 0.5 A to 600 A _{DC}						600 mV _{PEAK} ou DC				1 A / 10 mV 1 A / 1 mV				DC to 10 kHz	≤ 1.5% ≤ 2%	P01120072	
	PAC22		0.2 A to 150 A _{PEAK} 0.4 A to 150 A _{DC} 0.5 A to 1,400 A _{PEAK} 0.5 A to 1,400 A _{DC}						1.5 V _{PEAK} 1.4 V _{PEAK}				1 A / 10 mV 1 A / 1 mV				DC to 10 kHz	≤ 1.5% ≤ 2.5%	P01120073	

(1) The upper value corresponds to 120 % of the max. rated value.

*Reference for E3N + power supply > P01120047



FOR CURRENT SENSORS

MiniFlex® MA110/MA130 and AmpFlex® A110/A130

- Mains adapter / μ USB-B cable P01651023
- 110V-240V 50/60 Hz
- Female USB type A 5V 1A
- Charging and connection cable
- Male USB type A - male USB type Micro-B
- 1.80 m

MN73 / C173 / B102

- AN1 artificial neutral box P01197201

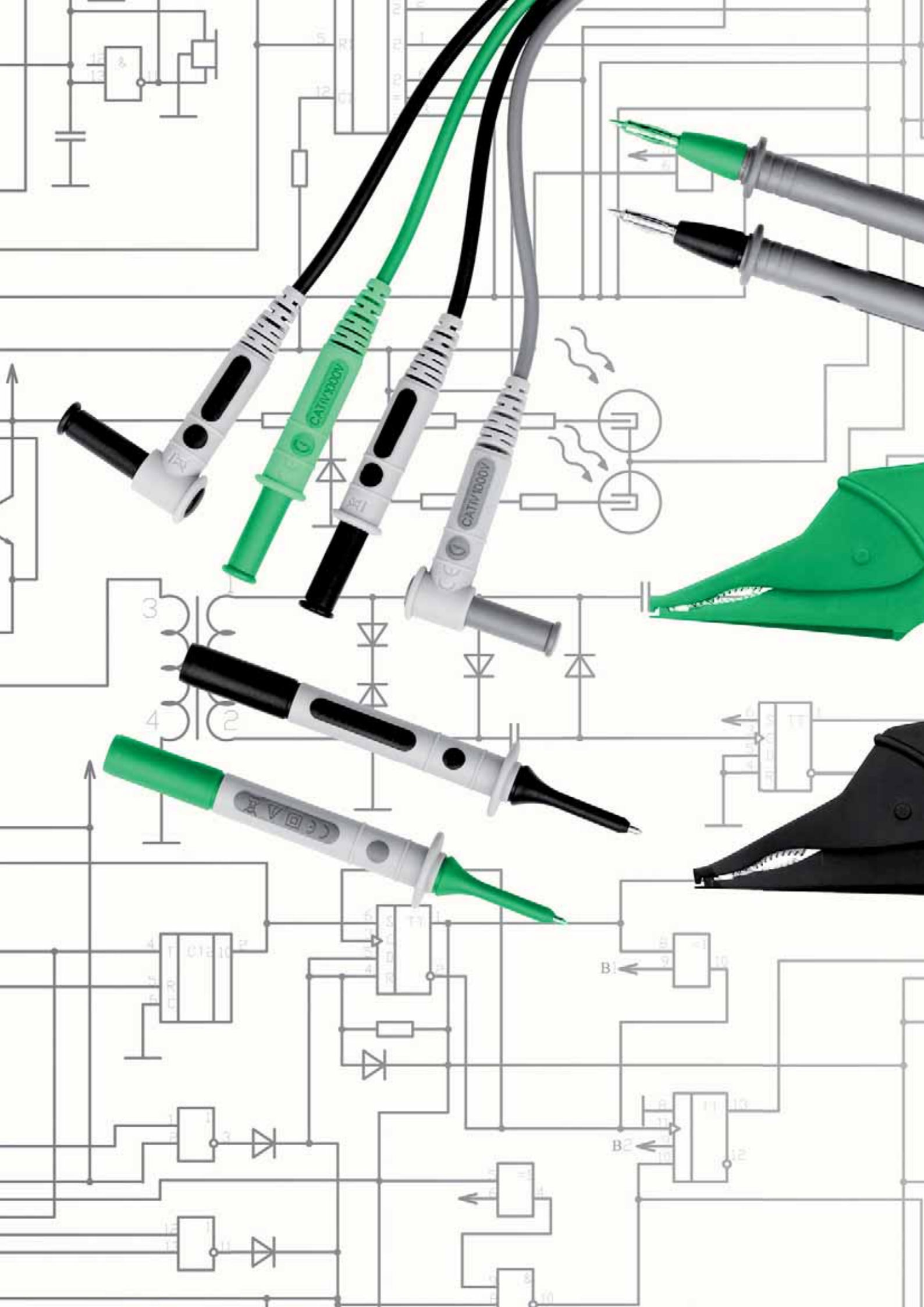
OTHER CURRENT SENSORS

- Mains adapter for E clamp P01101965
- Mains adapter for K clamp P01101966
- Mains adapter for PAC clamp P01101967
- Mains adapter for AmpFlex® A100 P01101968
- Mains adapter for MiniFlex® MA100 P01102986
- Mains adapter for MiniFlex® MA200 P01102987



AN1 artificial neutral box

FIND ALL OUR ACCESSORIES ON PAGE 230





ACCESSORIES

Protection, storage and transport

232

Connections

238

Adapters and probes

242

Fuses

243



ACCESSORIES

PROTECTION, STORAGE & TRANSPORT

SOFT CASES



E01



E02



E03



E04



E05



E06



E07



E08

BAGS



S01



S02



S03



S04



S05



S06



S07



S08



S09



S10

SHOULDER BAGS



S20



S21



S22



S23

HARD CASES



M01-M02-M03



M04-M05-M06



M07

MOUNTING SUPPORT



F01

WATERPROOF SITE CASES



B01



B02



PROTECTION, STORAGE AND TRANSPORT

Photo	L x H x W	Reference	Additional information
SOFT CASE			
E01	110 x 220 x 45 mm	P01298065Z	
E02	125 x 210 x 120 mm	P01298049	Specific to one instrument or product range. See pages 234
E03	125 x 265 x 60 mm	P01298043Z	
E04	180 x 75 x 45 mm	P01298012	
E05	185 x 135 x 85 mm	P01298046	Specific to one instrument or product range. See pages 234
E06	190 x 250 x 60 mm	P01298055	
E07	250 x 190 x 80 mm	P01298051	
E08	70 x 185 x 30 mm	P01298007	
BAG			
S01	120 x 200 x 60 mm	P01298074	Compatible with MultiFix
S02	120 x 245 x 60 mm	P01298075	Compatible with MultiFix
S03	120 x 320 x 60 mm	P01298076	Compatible with MultiFix
S04	150 x 230 x (40+40) mm	P01298032	
S05	165 x 250 x 60 mm	P06239502	
S06	180 x 220 x 75 mm	P01298036	
S07	225 x 270 x 70 mm	P01298033	
S08	240 x 140 x 130 mm	P01298006	
S09	355 x 255 x 235 mm	P01298056	
S10	360 x 200 x 140 + 360 x 160 x 35 mm	P01298061A	
SHOULDER BAG			
S20	330 x 240 x 240 mm	P01298078	
S21	380 x 280 x 200 mm	P01298066	All-terrain waterproof bottom. 2 compartments and space for documents. Supplied with shoulder strap
S22	575 x 320 x (200 + x + x) mm	P01298067	
S23		P01298031	
HARD CASE			
M01	270 x 195 x 65 mm	P01298071	Equipped with foam inserts. Delivered with strap and keys
M02	285 x 210 x 80 mm	P01298037	Specific to one instrument or product range. See pages 234
M03	285 x 210 x 80 mm	P01298037A	Specific to one instrument or product range. See pages 234
M04	320 x 255 x 75 mm	P01298004	Equipped with foam inserts. Delivered with strap and keys
M05	320 x 255 x 75 mm	P01298011	Specific to one instrument or product range. See pages 234
M06	320 x 255 x 75 mm	P01298040	Specific to one instrument or product range. See pages 234
M07	440 x 310 x 135 mm	P01298072	Equipped with foam inserts. Delivered with strap and keys
WATERPROOF CASE			
B01	272 x 248 x 130 mm	P01298068	Equipped with foam inserts
B02	272 x 248 x 182 mm	P01298069	Equipped with foam inserts

MULTIFIX MOUNTING ACCESSORY

P01102100Z

When used with the compatible soft cases and bags, this helps you to transport and mount the measuring instruments for greater user comfort.



REELING BOX

P01102149

To make sure that your cables are never tangled. Can be used to store up to 3 m of cable (1 x 3 m / 2 x 1.5 m). Built-in magnet for easy mounting on any metal surface.





ACCESSORIES

CHOOSE THE RIGHT PROTECTION FOR YOUR INSTRUMENT

	Mounting acc.	Soft case								Bag					Bag			
Photo no.	F01	E01	E02	E03	E04	E05	E06	E07	E08	S01	S02	S03	S04	S05	S06	S07	S08	S09
Code	P01102100Z	P01298065Z	P01298049	P01298043Z	P01298012 P01298012Z	P01298046	P01298055	P01298051	P01298007	P01298074	P01298075	P01298076	P01298032	P06239502	P01298036	P01298033	P01298006	P01298056
AL834																		
AN1 artificial neutral box																		
C.A 1052																		
C.A 1621, C.A 1623, C.A 1631																		
C.A 1725, C.A 1727																		
C.A 1864, C.A 1866																		
C.A 1877, C.A 1878, C.A 1882																		
C.A 40																		
C.A 401, C.A 402, C.A 403, C.A 404, C.A 405, C.A 406, C.A 406 KIT																		
C.A 41, C.A 43																		
C.A 5001, C.A 5003, C.A 5005																		
C.A 5005																		
C.A 5011																		
C.A 5030																		
C.A 5110, C.A 5120																		
C.A 5205G/10G/20G/30G/40G/60G																		
C.A 5231, C.A 5233																		
C.A 5271, C.A 5273, C.A 5275, C.A 5277																		
C.A 5287, C.A 5289																		
C.A 6030																		
C.A 61, C.A 65																		
C.A 6113, C.A 6116, C.A 6116N, C.A 6117																		
C.A 6115N																		
C.A 6121																		
C.A 6160																		
C.A 6240, C.A 6250																		
C.A 6410, C.A 6411, C.A 6412, C.A 6413, C.A 6415																		
C.A 6416, C.A 6417																		
C.A 6421, C.A 6423																		
C.A 6425																		
C.A 6454, C.A 6456																		
C.A 6460, C.A 6462																		
C.A 6501, C.A 6503																		
C.A 6505																		
C.A 6511, C.A 6513																		
C.A 6521, C.A 6523, C.A 6525																		
C.A 6522/24/26, C.A 6532/34/36																		
C.A 6531, C.A 6533																		
C.A 6541, C.A 6543																		
C.A 6545, C.A 6547																		



CHOOSE THE RIGHT PROTECTION FOR YOUR INSTRUMENT

Sheath	Shockproof sheath	Hard case							Bag				Strap		Photo no.
P01298015	P01298009B	P01298016	P03298504	M02	M03	M04	M05	M06	M02	M07	S20	S21	S22	S23	Code
															AL834
															AN1 artificial neutral box
															C.A 1052
															C.A 1621, C.A 1623, C.A 1631
															C.A 1725, C.A 1727
															C.A 1864, C.A 1866
															C.A 1877, C.A 1878, C.A 1882
															C.A 40
															C.A 401, C.A 402, C.A 403, C.A 404, C.A 405, C.A 406, C.A 406 KIT
															C.A 41, C.A 43
															C.A 5001, C.A 5003, C.A 5005
															C.A 5005
															C.A 5011
															C.A 5030
															C.A 5110, C.A 5120
															C.A 52056/106/206/306/406/606
															C.A 5231, C.A 5233
															C.A 5271, C.A 5273, C.A 5275, C.A 5277
															C.A 5287, C.A 5289
															C.A 6030
															C.A 61, C.A 65
															C.A 6113, C.A 6116, C.A 6116N, C.A 6117
															C.A 6115N
															C.A 6121
															C.A 6160
															C.A 6240, C.A 6250
															C.A 6410, C.A 6411, C.A 6412, C.A 6413, C.A 6415
															C.A 6416, C.A 6417
															C.A 6421, C.A 6423
															C.A 6425
															C.A 6454, C.A 6456
															C.A 6460, C.A 6462
															C.A 6501, C.A 6503
															C.A 6505
															C.A 6511, C.A 6513
															C.A 6521, C.A 6523, C.A 6525
															C.A 6522/24/26, C.A 6532/34/36
															C.A 6531, C.A 6533
															C.A 6541, C.A 6543
															C.A 6545, C.A 6547



ACCESSORIES

CHOOSE THE RIGHT PROTECTION FOR YOUR INSTRUMENT

Photo no.	Code	Mounting acc.	Soft case								Bag					Bag			
		F01	E01	E02	E03	E04	E05	E06	E07	E08	S01	S02	S03	S04	S05	S06	S07	S08	S09
		P01102100Z	P01298065Z	P01298049	P01298043Z	P01298012 P01298012Z	P01298046	P01298055	P01298051	P01298007	P01298074	P01298075	P01298076	P01298032	P06239502	P01298036	P01298033	P01298006	P01298056
C.A 6550, C.A 6555																			
C.A 702, C.A 703																			
C.A 704																			
C.A 730, C.A 735																			
C.A 745																			
C.A 740, C.A 760, C.A 740N, C.A 740N IP2X, C.A 760N, C.A 760N IP2X																			
C.A 742, C.A 742 IP2X, C.A 762, C.A 762 IP2X																			
C.A 745N, C.A 755, C.A 757																			
C.A 771, C.A 771 IP2X, C.A 773, C.A 773 IP2X																			
C.A 8220, C.A 8230																			
C.A 8331, C.A 8332, C.A 8333, C.A 8334, C.A 8335, C.A 8336																			
C.A 8352																			
C.A 8435																			
C.A 871, C.A 879																			
CADI 2																			
CDA 104																			
DTR 8510																			
F01, F03, F05, F07, F09																			
F11N, F13N, F15																			
F201, F203, F205																			
F21																			
F3N																			
F401, F403, F405, F407																			
F601, F603, F605, F607																			
F62, F65																			
FTV200																			
L101, L102, L111, L261, L322, L481, L562, L642, ML912																			
L452																			
MA400D, MA4000D																			
MAN'X 015, MAN'X 02S																			
MAN'X TOP, MAN'X TOP PLUS																			
MAX 2000, MAX 3000																			
PAC10, PAC11, PAC12																			
PAC20, PAC21, PAC22																			
PEL102, PEL103																			
PEL105																			
RW501, RW511, RW521, RW5012																			
SIMPLE LOGGER ML914, AL834																			
TK 1000																			
TP 850																			



CHOOSE THE RIGHT PROTECTION FOR YOUR INSTRUMENT

Sheath	Shockproof sheath	Hard case							Bag				Strap		Photo no.
P01298015	P012980098	P01298016	P03298504	M02	M03	M04	M05	M06	M02	M07	S20	S21	S22	S23	Code
															C.A 6550, C.A 6555
															C.A 702, C.A 703
															C.A 704
															C.A 730, C.A 735
															C.A 745
															C.A 740, C.A 760, C.A 740N, C.A 740N IP2X, C.A 760N, C.A 760N IP2X
															C.A 742, C.A 742 IP2X, C.A 762, C.A 762 IP2X
															C.A 745N, C.A 755, C.A 757
															C.A 771, C.A 771 IP2X, C.A 773, C.A 773 IP2X
															C.A 8220, C.A 8230
															C.A 8331, C.A 8332, C.A 8333, C.A 8334, C.A 8335, C.A 8336
															C.A 8352
															C.A 8435
															C.A 871, C.A 879
															CADI 2
															CDA 104
															DTR 8510
															F01, F03, F05, F07, F09
															F11N, F13N, F15
															F201, F203, F205
															F21
															F3N
															F401, F403, F405, F407
															F601, F603, F605, F607
															F62, F65
															FTV200
															L101, L102, L111, L261, L322, L481, L562, L642, ML912
															L452
															MA400D, MA400D
															MAN'X 015, MAN'X 02S
															MAN'X TOP, MAN'X TOP PLUS
															MAX 2000, MAX 3000
															PAC10, PAC11, PAC12
															PAC20, PAC21, PAC22
															PEL102, PEL103
															PEL105
															RW501, RW511, RW521, RW5012
															SIMPLE LOGGER ML914, AL834
															TK 1000
															TP 850







ACCESSORIES

Ø 4 MM BANANA CONNECTION TECHNOLOGY



MEASUREMENT LEADS


Moulded

Model	Description
	Set of 2 red/black moulded PVC leads P01295450Z Insulated straight male plug Ø 4 mm Insulated straight male plug Ø 4 mm • 15 A • 1.5 m • 1000 V CAT IV
	Set of 2 red/black moulded silicone leads P01295452Z Insulated straight male plug Ø 4 mm Insulated straight male plug Ø 4 mm • 15 A • 1.5 m • 1000 V CAT IV

Model	Description
	Set of 2 red/black moulded PVC leads P01295451Z Insulated straight male plug Ø 4 mm Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 1000 V CAT IV
	Set of 2 red/black moulded silicone leads P01295453Z Insulated straight male plug Ø 4 mm Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 1000 V CAT IV



Standards


Model	Description
	Set of 2 red/black PVC leads P01295288Z Insulated straight male plug Ø 4 mm Insulated straight male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV / 1000 V CAT III
	Set of 2 red/black PVC leads P01295290Z Insulated straight male plug Ø 4 mm with rear connection. Insulated straight male plug Ø 4 mm with rear connection • 20 A • 2 m • 600 V CAT III

Model	Description
	Set of 2 red/black PVC leads P01295289Z Insulated straight male plug Ø 4 mm Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV / 1000 V CAT III

LEADS WITH TEST PROBES

For CAT IV & CAT III installations

Model	Description
	Set of 2 red/black PVC test-probe leads P01295455Z Insulated straight male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV / 1000 V CAT III
	Set of 2 IP2X PVC leads for multimeters P01295461Z Complies with NF C 18-510 and IEC 61010-031+A1:2008 • IP2X test probe • Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV


Model	Description
	Set of 2 red/black PVC test-probe leads P01295456Z Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV / 1000 V CAT III

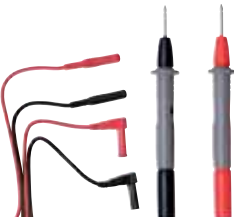


Ø 4 MM BANANA CONNECTION TECHNOLOGY

LEADS WITH TEST PROBES


For CAT II & lower installations

Model	Description
	Measurement leads + test probes kit P01295475Z comprising: Set of 2 red/black PVC leads Insulated straight male plug Ø 4 mm Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV / 1000 V CAT III + Set of 2 moulded test probes Ø 4 mm • Female plug Ø 4 mm • CAT II 300 V


Model	Description
	Measurement leads + test probes kit P01295474Z comprising: Set of 2 red/black PVC leads Insulated straight male plug Ø 4 mm Insulated elbowed male plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV / 1000 V CAT III + Set of 2 moulded test probes Ø 2 mm • Female plug Ø 4 mm • CAT II 300 V


REMOVABLE TEST PROBES

For CAT IV & CAT III installations

Model	Description
	Set of 2 red/black moulded test probes P01295454Z • Female plug Ø 4 mm • 15 A • CAT IV / CAT III 1000 V

For CAT II & lower installations

Model	Description
	Set of 2 moulded test probes Ø 4 mm P01295458Z • Female plug Ø 4 mm • 15 A • CAT II 300 V


Model	Description
	Set of 2 moulded test probes Ø 2 mm P01295460Z • Female plug Ø 4 mm • 15 A • CAT II 300 V




ACCESSORIES

PRODUCT-SPECIFIC ACCESSORIES



FOR MULTIMETERS OR TESTERS WITH + TERMINAL ON TOP

Model	Description
	Red test probe Ø 4 mm P01103060Z removable for tester or DMM Use as "hands-free" test probe • Male plug Ø 4 mm • 600 V CAT IV




FOR C.A 745 TESTER OR REMOTE-CONTROL PROBE

Model	Description
	Red test probe Ø 4 mm P01103061Z removable with locking pin For tester or remote-control probe • Male plug Ø 4 mm • 600 V CAT IV




FOR C.A 704, C.A 740 & C.A 760 VOLTAGE ABSENCE TESTERS

Model	Description
	Removable red test probe P01103059Z • Female plug Ø 4 mm • 600 V CAT IV
	Black test-probe lead P01295464Z Insulated elbowed female plug Ø 4 mm Length 0.85 m • 600 V CAT IV

FOR C.A 745N, C.A 755 AND C.A 757




Model	Description
	Set of red/black test probes P01102152Z • CAT III/IV
	Set of red/black test probes P01102153Z • Ø 2 mm • CAT II
	Set of red/black test probes P01102154Z • Ø 4 mm • CAT II




FOR ALL VOLTAGE ABSENCE TESTERS, C.A 74X/XN SERIES / C.A 76X/XN SERIES

Model	Description
	Set of 2 PVC IP2X leads P01295463Z for C.A 760 and C.A 704 VATs Complies with NF C 18-510 and IEC 61010-031+A1:2008 • IP2X test probe Ø 2 mm • Elbowed female plug Ø 4 mm • 15 A • 1.5 m • 600 V CAT IV
	Red removable test probe P01102008Z • Female plug Ø 4 mm • IEC 61243-3
	Black test-probe lead P01102009Z Insulated elbowed female plug Ø 4 mm • Length 0.85 m • IEC 61243-3

Model	Description
	Set of 2 IP2X leads for C.A 740N and C.A 760N VATs P01295462Z • IP2X test probe Ø 4 mm • Elbowed female plug Ø 4 mm • 15 A • NF C 18-510 / IEC 61243-3 1000 V • 1.5 m • 0.25 m & 0.85 m : P01295285Z
	Set of IP2X accessories for VAT P01102121Z • 2 x IP2X Ø 4 mm test probes • 1 point-point cable, L = 1.10 m
	C.A 751 measurement adapter P01101997Z • For 2P+E sockets









FOR C.A 771 & C.A 773 VOLTAGE ABSENCE TESTERS

Model	Description
	Set of 2 red/black IP2X test probes Ø 4 mm P01102128Z Female plug Ø 4 mm IEC 61423-3 1000 V
	Set of 2 red/black IP2X test probes P01102127Z Female plug Ø 4 mm 1000 V CAT IV
	Set of 2 red/black test probes P01102123Z Female plug Ø 4 mm 1000 V CAT IV

Model	Description
	Set of 2 red/black test probes Ø 2 mm with crystal cap P01102124Z Female plug Ø 4 mm IEC 61423-3 1000 V
	Set of 2 red/black test probes Ø 4 mm P01102125Z Female plug Ø 4 mm IEC 61423-3 1000 V
	Crystal protective cap for test probe P01102126Z



FOR CAT IV & CAT III INSTALLATIONS

Model	Description	Model	Description
	Set of 2 red/black crocodile clips P01295457Z • 15 A • 1000 V CAT IV		Set of 2 red/black crocodile wire grips P01102053Z • 20 A • 1000 V CAT III
	Set of leads and measuring accessories for electricians P01295459Z • 2 x 1000 V CAT IV moulded test probes • 2 x 1.5 m 1000 V CAT IV red/black moulded leads with straight male plug – elbowed male plug • 2 x red/black 1000 V CAT IV crocodile clips • 2 x 300 V CAT II moulded test probes Ø 4 mm		Set of 2 adapters P01102101Z Insulated female BNC plug–Red/black insulated male plugs Ø 4 mm with 19 mm spacing • 600 V CAT III
	Kit of 2 PVC leads + 2 test probes Ø4 mm P01295475Z • Straight male plug Ø4 mm – Elbowed male plug Ø4 mm • Probe Ø4 mm – Female plug Ø 4mm • 300 V CAT II		Kit of 2 PVC leads + 2 test probes Ø2 mm P01295474Z • Straight male plug Ø4 mm – Elbowed male plug Ø4 mm • Probe Ø2 mm – Female plug Ø 4mm • 300 V CAT II
	Set of 2 red/black magnetized test probes P01103058Z For voltage measurement only Ø test probe: 6.6 mm – Elbowed female plug Ø 4 mm • 1000 V CAT III / 600 V CAT IV		PVC lead AG-1066Z Insulated male BNC plug – Insulated straight male banana plugs Ø 4 mm (red/black) with rear connection • 1 m • 500 V CAT III

FOR CAT II & LOWER INSTALLATIONS


Model	Description	Model	Description
	Set of 3 measurement adapters for housing P01102114Z 2 red/black insulated straight male plugs Ø4 mm • E27 screw socket • B22 bayonet socket • 2-pole mains socket (P/N) • 250 V CAT II		C.A 753: Measurement adapter for 2P+E socket P01191748Z • Suitable for European and Schuko sockets • Can be used for measurements on the P (Phase), N (Neutral) and PE (Earth) conductors in total safety • Guarantees mechanical and electrical contact with all test probes (Ø2, Ø4, IP2x, etc.) • Shows the presence of a P-N voltage (> 200 V) and indicates the phase position • IEC 61010 230 V CAT II
	Current lead equipped with a French 2P+E mains socket P03295509 • For inserting an ammeter in series in total safety • For measuring the current with a current clamp without having to remove the outer sheath of the power supply cable		Measurement lead for French and German 2P+E mains sockets P06239307 For direct measurement on a mains socket Quick implementation and reliable connections
	Set of 2 red/black insulation-piercing clips P01102055Z • 30 V AC, 60 V DC		CMS clamp HX0064 Copper-gold-plated beryllium contacts Output via male plugs Ø 4 mm • 1.2 m • SELV
	Set of 2 adapters P01101846 Red/black insulated male BNC – female sockets Ø 4 mm with 19 mm spacing • 500 V CAT I, 150 V CAT III		Set of 2 adapters P01101847 Red/black insulated BNC male – male sockets Ø 4 mm with 19 mm spacing • 500 V CAT I, 150 V CAT III



ACCESSORIES

OTHER ACCESSORIES

FOR CAT II & LOWER INSTALLATIONS



Modèle	Description
	SHT40KV high-voltage probe for multimeters P01102097 Maximum rated voltage: 40 kVdc, 28 kVRMS or 40 kVPEAK (50/60 Hz) Division ratio (input/output): 1 kV / 1 V For multimeters with 10 MΩ input impedance



EXTERNAL POWER SUPPLY & MAINS POWER PACK

Model	Description
	Set of 4 x 1.5 V LR06 rechargeable batteries with low self-discharge plus charger HX0053
	Set of 4 x 1.5 V LR06 rechargeable batteries with low self-discharge HX0051B



Model	Description
	230 V / μUSB mains adapter – B P01651023 • 110 – 240 V 50/60 Hz • Female USB type A, 5 V 1 A Charging and connection cable • Male USB type A – Male USB type μ-B • 1.8 m


TEMPERATURE AND ROTATION SPEED MEASUREMENT PROBES

Model	Description
	C.A 1711 P01102082 Tachometer probe - Pulse output $\frac{1.1V}{0}$ / rev. - 2 insulated banana plugs Ø 4 mm - Measurement range: 6 to 120,000 RPM - IP 53
	C.A 801 P01652401Z Temperature adapter for multimeters - -40 °C to +1,000 °C - 1 mVDC / °C (or /°F) Delivered with 1 K sensor and 1 battery

Model	Description
	C.A 1871 P01651610Z Infrared sensor Compatible with any multimeter equipped with an mV range - Measurement range: -30 °C to +550 °C - Output: 1 mV/1 °C - Distance/spot ratio: 8/1 - Accuracy: ± 2 %
	C.A 803 P01652411Z Temperature adapter for multimeters - 2 measurement channels - -40 °C to +1,000 °C - 1 mVdc / °C (or /°F) - Ø1 - Ø2 differential measurement Delivered with 2 K sensors and 1 battery

ADAPTERS FOR TEMPERATURE MEASUREMENT SENSORS

Modèle	Description
	Set of 2 safety thermocouple adapters for multimeters P01102106Z Female thermocouple plug – insulated red/black male plugs Ø 4 mm with 19 mm spacing
	Safety adapter and K-sensor temperature probe P01102107Z For multimeters and multimeter clamps equipped with a temperature measurement calibre with 19 mm-spaced banana inputs - Measurement range from -50 °C to +350 °C - Sensor length: approx. 100 cm

Modèle	Description
	Pt100/Pt1000 sensor adapter for multimeters HX0091 Female Pt100/Pt1000 plug – Red/black insulated male plugs Ø 4 mm



Product	Standardized dimensions (mm)	Amperage	Reference
C.A 10	6 x 32	8 A	P01297013
C.A 1621	5 x 20	125 mA	P01297099
C.A 1631	5 x 20	125 mA	P01297099
C.A 401	6 x 32	1 A	P03297507
C.A 401	6 x 32	10 A	P03297510
C.A 4010	6 x 32	0.315 A	P03297509
C.A 4010	6 x 32	16 A	P03297505
C.A 4020	6 x 32	0.315 A	P03297509
C.A 4020	6 x 32	16 A	P03297505
C.A 403	6 x 32	0.315 A	P03297509
C.A 404	6 x 32	1.25 A	P01297015
C.A 405	6 x 32	6.3 A	P01297016
C.A 406	5 x 20	0.16 A	P03297508
C.A 406	6 x 32	3.15 A	P01100726
C.A 4300	6 x 32	1 A	P03297507
C.A 4300	6 x 32	10 A	P03297510
C.A 47	5 x 20	1 A	P01297075
C.A 47	5 x 20	4 A	P01297076
C.A 47	5 x 20	0.315 A	P01297074
C.A 5000	6 x 32	5 A	P01297035
C.A 5000	6 x 32	0.5 A	P01297028
C.A 5003	6 x 32	1.6 A	P01297036
C.A 5003	10 x 38	16 A	P01297037
C.A 5005	6 x 32	1 A	P01297039
C.A 5005	6 x 32	10 A	P01297038
C.A 5011	6 x 32	1 A	P01297039
C.A 5011	6 x 32	10 A	P01297038
C.A 5110	6 x 32	1 A	P03297507
C.A 5120	6 x 32	1 A	P03297507
C.A 5120	6 x 32	10 A	P03297510
C.A 5210	10 x 38	12 A	P01297021
C.A 5210	6 x 32	0.4 A	P01297020
C.A 5210G	10 x 38	12 A	P01297021
C.A 5210G	6 x 32	0.4 A	P01297020
C.A 5220	10 x 38	12 A	P01297021
C.A 5220	6 x 32	0.4 A	P01297020
C.A 5220G	10 x 38	12 A	P01297021
C.A 5220G	6 x 32	0.4 A	P01297020
C.A 5230G	10 x 38	12 A	P01297021
C.A 5230G	6 x 32	0.5 A	P01297028
C.A 5240G	10 x 38	12 A	P01297021
C.A 5233	6 x 32	10 A	AT0070
C.A 5240G	6 x 32	0.5 A	P01297028
C.A 5260G	6 x 32	0.1 A	P01297012
C.A 5271	10 x 38	10 A	P01297096
C.A 5273	10 x 38	10 A	P01297096
C.A 5275	6 x 32	0.63 A	P01297098
C.A 5275	10 x 38	10 A	P01297096
C.A 5277	6 x 32	0.63 A	P01297098
C.A 5277	10 x 38	10 A	P01297096
C.A 5287	10 x 38	11 A	P01297092
C.A 5287	10 x 38	0.44 A	P01297094
C.A 5289	10 x 38	11 A	P01297092
C.A 5289	10 x 38	0.44 A	P01297094
C.A 6114 / 15N	6 x 32	3.15 A	P01297080

Product	Standardized dimensions (mm)	Amperage	Reference
C.A 6115N	5 x 20	2 A	P01297026
C.A 6115N	6 x 32	3.15 A	P01297080
C.A 6121	5 x 20	1 A	P01297031
C.A 6121	5 x 20	4 A	P01297032
C.A 6121	6 x 32	0.2 A	P01297033
C.A 6121	10 x 38	20 A	P01297030
C.A 6160	6 x 32	16 A	P01297086
C.A 6160	5 x 20	2.5 A	P01297085
C.A 6240	6 x 32	12.5 A	P01297091
C.A 6250	5 x 20	2 A	P01297090
C.A 6250	6 x 32	16 A	P01297089
C.A 6421	6 x 32	0.1 A	P01297012
C.A 6423	6 x 32	0.1 A	P01297012
C.A 6425	6 x 32	0.1 A	P01297012
C.A 6460	6 x 32	0.1 A	P01297012
C.A 6462	6 x 32	0.1 A	P01297012
C.A 6470	5 x 20	0.63 A	AT0094
C.A 6472	5 x 20	0.63 A	AT0094
C.A 6501	6 x 32	0.2 A	P01297095
C.A 6503	6 x 32	0.2 A	P01297095
C.A 6511	6 x 32	1.6 A	P01297022
C.A 6513	6 x 32	1.6 A	P01297022
C.A 6521	6 x 32	0.63 A	P01297078
C.A 6523	6 x 32	0.63 A	P01297078
C.A 6525	6 x 32	0.63 A	P01297078
C.A 6531	6 x 32	0.63 A	P01297078
C.A 6541	6 x 32	0.1 A	P01297072
C.A 6541	8 x 50	2.5 A	P01297071
C.A 6543	6 x 32	0.1 A	P01297072
C.A 6543	8 x 50	2.5 A	P01297071
C.A 6545	5 x 20	0.1 A	P03297514
C.A 6547	5 x 20	0.1 A	P03297514
C.A 6549	5 x 20	0.1 A	P03297514
CADI 2	5 x 20	12.5 A	P01297004
CADI 2	5 x 20	3.15 A	P01297002
CAMPUS	5 x 20	0.16 A	P03297508
CAMPUS	6 x 32	3.15 A	P01100726
CdA 651	6 x 32	3.15 A	P01100726
CdA 651M	6 x 32	3.15 A	P01100726
CdA 778N	6 x 32	2 A	P03297513
CdA 778N	6 x 32	10 A	P03297502
CdA 791	8 x 32	6 A	P03100801
CdA 800	5 x 20	0.1 A	P03100201
CdA LAB'X 9000	5 x 20	1.6 A	P03297501
CdA100-A	6 x 32	0.4 A	P01297020
CONPAMATIC 2	10 x 38	10 A	P01100731
CONPAMATIC 2	6 x 32	3.15 A	P01100726
DETEC 220	5 x 20	0.315 A	P01297014
DTR 8500	5 x 20	1 A	P01297031
DTR 8500	5 x 20	4 A	P01297041
DTR 8500	5 x 20	0.5 A	P01297042
IMEG 500	5 x 20	0.2 A	P02297302
IMEG 500N	5 x 20	0.2 A	P02297302
ISOL 1000N G4	6 x 32	0.315 A	P01101724
ISOL 5000N G4	6 x 32	0.315 A	P01101724



ACCESSORIES

FUSES

Product	Standardized dimensions (mm)	Amperage	Reference
LOCAT 110	5 x 20	0.1 A	P03297514
LOCAT 220	5 x 20	0.1 A	P03297514
MANIP W1	6 x 32	1.25 A	P01297015
MANIP Z10	5 x 20	0.16 A	P03297508
MAN'X 015	6 x 32	1.6 A	P01297017
MAN'X 02S	6 x 32	2 A	P03297513
MAN'X 02S	10 x 38	10 A	P01100731
MAN'X 04B	8 x 32	10 A	P03100830
MAN'X 04B	5 x 20	1.6 A	P03297501
MAN'X 102	5 x 20	0.160 A	P03297508
MAN'X 102	6 x 32	3.15 A	P01100726
MAN'X 500	6 x 32	2 A	P03297513
MAN'X 500	6 x 32	16 A	P03297505
MAN'X 520A	6 x 32	0.315 A	P03297509
MAN'X 520A	6 x 32	16 A	P03297505
MAN'X TOP	6 x 32	0.315 A	P03297509
MAN'X TOP	6 x 32	16 A	P03297505
MAN'X TOP PLUS	6 x 32	0.315 A	P03297509
MAN'X TOP PLUS	6 x 32	16 A	P03297505
MAX 2000	6 x 32	1 A	P03297510
MAX 2000	6 x 32	10 A	P03297510
MAX 3000	6 x 32	1 A	P03297510
MAX 3000	6 x 32	10 A	P03297510
MH600	5 x 20	0.16 A	P01297043
MH600	5 x 20	0.310 A	P01297045
MH600	5 x 20	0.315 A	P01297074
RO600	5 x 20	2 A	P01297069
RO600	5 x 20	0.25 A	P01297070
Tellurohm C.A 2	6 x 32	0.1 A	P01297012
C.A 5001	6 x 32	0.5 A	P01297028
C.A 5001	6 x 32	5 A	P01297035
C.A 6522	6 x 32	0.63 A	P01297078
C.A 6524	6 x 32	0.63 A	P01297078
C.A 6526	6 x 32	0.63 A	P01297078
C.A 6532	6 x 32	0.63 A	P01297078
C.A 6534	6 x 32	0.63 A	P01297078
C.A 6536	6 x 32	0.63 A	P01297078
C.A 6471	5 x 20	0.63 A	AT0094

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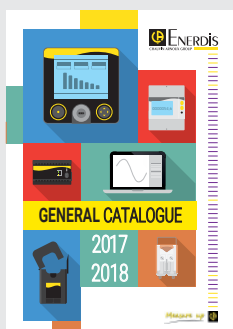
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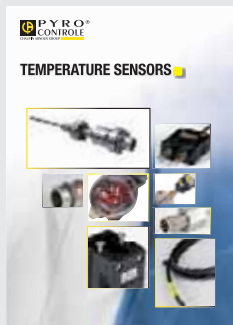
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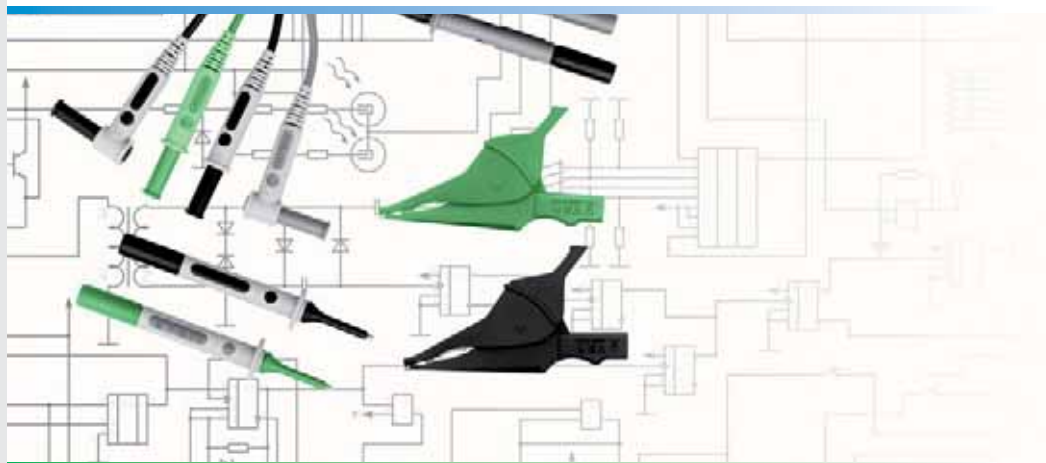
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