

Изх. № BGR 1012 / 06.10.2022 г.

До: "АЕЦ Козлодуй" ЕАД
Управление "Търговско"

Отдел "Маркетинг и доставки"

На вниманието на: Христо Пачев - Гл. експерт маркетинг
тел.: + 359 973 7 6140e-mail: HPatchev@npp.bg
commercial@npp.bg**Относно:** Пазарна консултация № 5039 -
„Доставка на измервателни прибори“
Обособена позиция № 5 –
„Мегаомметри“**Уважаеми г-н Пачев,**

Във връзка с Покана за пазарна консултация № 5039 - „Доставка на измервателни прибори“ и Обособена позиция № 5 – „Мегаомметри“ имаме удоволствието да представим нашето

ИНДИКАТИВНО ПРЕДЛОЖЕНИЕ

№	ID	Наименование	Мярка	К-во	Единична Цена в лв. (без ДДС)	Стойност, лв. (без ДДС)
1.	125747	P01139712 C.A 6547 МЕГАОММЕТЪР 5kV	бр.	3	6835	20505
2.	125748	P01140826 C.A 6526 МЕГАОММЕТЪР 1kV	бр.	4	1330	5320
3.	126367	P01139713 C.A 6549 MEGOhMMETER 5 kV	бр.	1	7735	7735
Общо:						33 560

ТЪРГОВСКИ УСЛОВИЯ**Цените** са в лева, без ДДС, DDP Козлодуй.**Срок на доставка:** 80 календарни дни от датата на заявката.**Гаранционен срок:** 24 месеца.**Плащане:** По банков път, до 30 календарни дни от датата на приемане на доставката на основание на данъчна фактура.**Придружаваща документация:** Приемо-предавателен протокол; Гаранционна карта, Ръководство за експлоатация.**Адрес за кореспонденция:**

УНИТЕХ КОНТРОЛ ЕООД, 1000 гр. София, ул. "Ген. Йосиф В. Гурко" № 48.

Банкови реквизити: Разплащателна сметка: BG 94 UNCR 7630 1077 5989 99.

BIC код Уникредит Булбанк АД: UNCRBGSF

ИН по ЗДДС – BG831758563; **ИН по ДОПК** – 831758563.**За контакти:** Георги Милушев, моб. 088 850 1235; тел./факс: 02 821 04 05,
e-mail: office@unitech-bg.com.**Валидност на офертата:** 1 месец от датата на получаването**Приложение:** Техническа спецификация.

Заличено на основание ЗЗЛД

В очакване на Вашия отговор,

УНИТЕХ КОНТРОЛ ЕООД

Изготвил: инж. А. Ангелов

Управител:

/доц. д-р инж. Г. Милушев/

ТЕХНИЧЕСКА СПЕЦИФИКАЦИЯ
За „Доставка на измервателни прибори“
Обособена позиция № 5 – „Мегаомметри“

ID производител	Описание на артикула
P01139712 C.A 6547	Мегаомметър за 5000 V с характеристики: входно напрежение: в границите от 85 до 256 V / 50-60 Hz; работни напрежения: 4 фиксирани - 500 V, 1000 V, 2500 V, 5000 V, и настройваеми - с нараствания 10 V в диапазона от 40 V до 1000 V; с нараствания 100 V в диапазона от 1000V до 5100 V; режими: заложи, предварително конфигурирани диагностични тестове в това число - PI - индекс на поляризация, DAR - коефициент на диелектрична абсорбция и DD (диелектричен разряд). Интерфейс: USB конектор за връзка с компютър (софтуер за обработка на данни с мегометър); електрическа безопасност: IEC/EN 61010-2-030 или BS EN 61010-2-030, IEC 61557; електромагнитна съвместимост - в съответствие с IEC/EN 61326-1 или BS EN 61326-1; IP 53 съгласно EN60529; размери: 270 x 250 x 180 mm; тегло: 4.3 kg
P01140826 C.A 6526	Мегаомметър за 1000 V с характеристики: номинални стойности на изпитателното напрежение: 50V, 100V, 250V, 500V, 1000V; звукова аларма: по предварително зададени стойности, двоен цифров дисплей и аналогова скала, индикация за състоянието на батерията, TEST бутон и HOLD бутон, съхраняване на резултатите от измерванията, автоматично изключване, bluetooth трансфер на данни. Размери на уреда: 211x108x60mm. Тегло на уреда: 850g.
P01139713 C.A 6549	Тестер за изолационно съпротивление 10TΩ (5 kV) максимум на измерване на изол. съпротивление, програмирани по време PI, DAR и DD диагностични тестове, презареждаеми NiMh батерии - 8 x 1.2 V / 3.5 Ah, работа с мрежово напрежение при изтощена батерия: 85 до 256 V / 50-60 Hz; вградена функция волтметър (1 V до 2500 V DC - 15...500 Hz) 1000 V CAT III or 600 V CAT IV - клас на защита, LCD дисплей с автоматична подсветка, тест напрежение - 4 фиксирани - 500 V, 1000 V, 2500 V, 5000 V, и настройваеми - с нараствания 10 V в диапазона от 40 V до 1000 V; с нараствания 100 V в диапазона от 1000V до 5100 V.

MANUFACTURER'S AUTHORIZATION LETTER

Date: 02/04/2021

To: UniTech Control Ltd

WHEREAS **CHAUVIN ARNOUX GROUP** who are established and reputable manufacturers of portable measuring instruments having headquarter at CHAUVIN ARNOUX 12-16 Rue Sarah Bernhardt, 92600 Asnières-sur-Seine, France do hereby authorize:

The Bidder: NPP Kozloduy

Address: 3321 Kozloduy Bulgary

Tel : +359 973 7 20 20

Fax: + 359 973 7 60 73

to purchase, to resell and to supply portable measuring instruments manufactured by our company.

Best regards,

Заличено на основание 33ЛД

M. Philippe CONTANT

Export Manager

Test and Measurement

CHAUVIN ARNOUX

p.o. Mr. Contant.



Пачев, Христо Б.

From: Богоева, Юлия К.
Sent: 07 октомври 2022 г. 8:56
To: Пачев, Христо Б.
Сс: Александров, Пламен Г.; Лазарова, Милена Т.
Subject: FW: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 5 – „Мегаомметри”
Attachments: 20221006 Offer Megohmmeters.pdf; CA 6522, CA 6524, CA 6526.PDF; CA6505, CA6545, CA6547, CA6549.PDF; Chauvin Arnoux_AUTHORIZATION UNITECH CONTROL-NPP.pdf

BX-E-5563/07.10.2022

-----Original Message-----

From: office@unitech-bg.com <office@unitech-bg.com>

Sent: Thursday, October 6, 2022 6:33 PM

To: commercial <commercial@npp.bg>

Сс: Пачев, Христо Б. <HPatchev@npp.bg>; Office <office@unitech-bg.com>

Subject: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 5 – „Мегаомметри”

Уважаеми Колеги,

Приложено изпращам:

1. Оферта по Обособена позиция № 5 – „Мегаомметри” във връзка с Пазарна консултация №5039 - „Доставка на измервателни прибори”.
2. Техническа информация за предложените уреди.
3. Оторизационен документ от производителя.

По-подробна информация за уредите може да се види на сайта на Chauvin Arnoux:

https://catalog.chauvin-arnoux.com/fr_en/produits/chauvin-arnoux/insulation-testers

Best regards,

Angel Angelov
mobile: +359 88 962 7432
mail: angelov@unitech-bg.com
www.unitech-bg.com
48 "General Yosif V. Gurko" Str.
1000 Sofia Center, Bulgaria

This email was scanned by Bitdefender

C.A 6522 C.A 6524 C.A 6526



Megohmmeters

Thank you for purchasing a **megohmmeter C.A 6522, C.A 6524 or C.A 6526.**

For best results from your instrument:

- **read** these operating instructions carefully,
- **comply** with the precautions for use.

	WARNING, risk of DANGER! The operator must refer to these instructions whenever this danger symbol appears.
	WARNING, risk of electric shock. The voltage applied to parts marked with this symbol may be hazardous.
	Equipment protected by double insulation.
	Earth.
	The voltage on the terminals must not exceed 700 V.
	Battery.
	Remote control probe.
	Information or useful tip.
	The product is declared recyclable following an analysis of the life cycle in accordance with standard ISO14040.
	Chauvin Arnoux has adopted an Eco-Design approach in order to design this appliance. Analysis of the complete lifecycle has enabled us to control and optimize the effects of the product on the environment. In particular this appliance exceeds regulation requirements with respect to recycling and reuse.
	The CE marking indicates compliance with the European Low Voltage Directive (2014/35/EU), Electromagnetic Compatibility Directive (2014/30/EU), Radio Equipment Directive (2014/53/EU), and Restriction of Hazardous Substances Directive (RoHS, 2011/65/EU and 2015/863/EU).
	The UKCA marking certifies that the product is compliant with the requirements that apply in the United Kingdom, in particular as regards Low-Voltage Safety, Electromagnetic Compatibility, and the Restriction of Hazardous Substances.
	The rubbish bin with lines through it indicates that, in the European Union, the product must undergo selective disposal in compliance with Directive WEEE 2012/19/EU. This equipment must not be treated as household waste.

Definition of measurement categories

- Measurement category IV corresponds to measurements taken at the source of low-voltage installations.
Example: power feeders, counters and protection devices.
- Measurement category III corresponds to measurements on building installations.
Example: distribution panel, circuit-breakers, machines or fixed industrial devices
- Measurement category II corresponds to measurements taken on circuits directly connected to low-voltage installations.
Example: power supply to electro-domestic devices and portable tools.

PRECAUTIONS FOR USE

This instrument is compliant with safety standard IEC/EN 61010-2-034 or BS EN 61010-2-034 and the leads are compliant with IEC/EN 61010-031 or BS EN 61010-031, for voltages up to 600 V in category IV or 1,000 V in category III.

Failure to observe the safety instructions may result in electric shock, fire, explosion, and destruction of the instrument and of the installations.

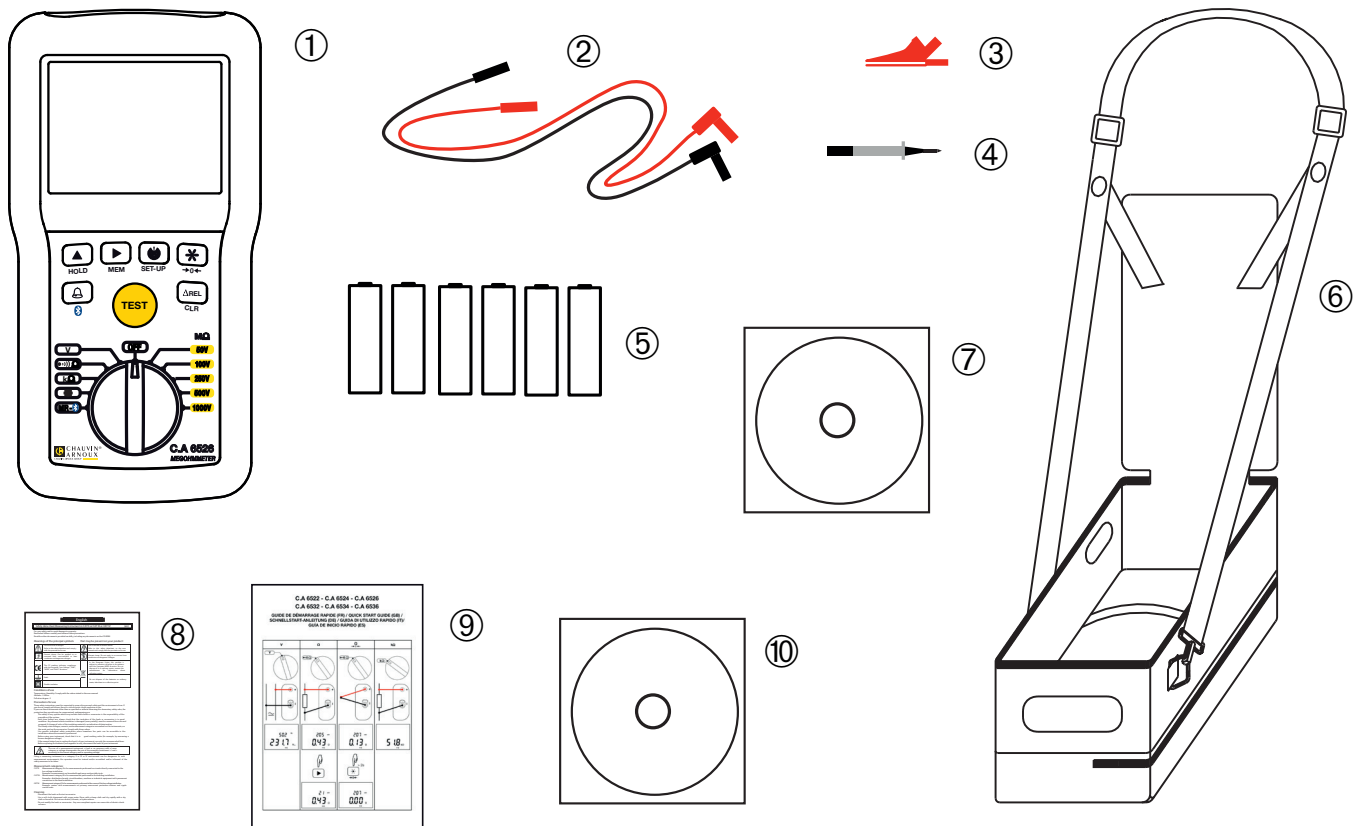
- The operator and/or the responsible authority must carefully read and clearly understand the various precautions to be taken in use. Sound knowledge and a keen awareness of electrical hazards are essential when using this instrument.
- If you use this instrument other than as specified, the protection it provides may be compromised, thereby endangering you.
- The safety of any system in which this instrument might be incorporated is the responsibility of the integrator of the system.
- This instrument can be used on category IV installations, for voltages not exceeding 600 VRMS with respect to earth or 700 VRMS max between terminals.
- Do not use the instrument on networks of which the voltage or category exceeds those mentioned.
- Observe the environmental conditions of use.
- Except for voltage measurements, make no measurements on live devices.
- Do not use the instrument if it seems to be damaged, incomplete, or poorly closed.
- Before each use, check the condition of the insulation on the leads, housing, and accessories. Any item of which the insulation is deteriorated (even partially) must be set aside for repair or scrapping. There is a risk of electric shock if the instrument is used without its battery compartment cover.
- Before using your instrument, check that it is perfectly dry. If it is wet, it must be thoroughly dried before it can be connected or used.
- Use only the leads and accessories supplied. The use of leads (or accessories) of a lower voltage rating or category limits the use of the combined instrument + leads (or accessories) to the lowest category and service voltage.
- When handling the leads, test probes, and crocodile clips, keep your fingers behind the physical guard.
- Before removing of the battery compartment cover, make sure that the measurement leads (and accessories) are disconnected. Replace all of the batteries at once. Use alkaline batteries.
- Use personal protection equipment systematically.
- All troubleshooting and metrological checks must be done by competent, accredited personnel.

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1. PRESENTATION

1.1. DELIVERY CONDITION



- ① One C.A 6522, C.A 6524, or C.A 6526, depending on which model was ordered.
- ② Two straight/right-angle safety leads (red and black).
- ③ One red crocodile clip.
- ④ One black test probe.
- ⑤ Six LR6 or AA batteries.
- ⑥ One carrying case, which also allows hands-free use.
- ⑦ One CD containing the user manuals (one file per language).
- ⑧ One multilingual safety data sheet.
- ⑨ One multilingual getting started guide.
- ⑩ One CD containing the MEG software for the C.A 6526.

1.2. ACCESSORIES

Type 3 remote control probe

Continuity pole

Thermometer + K thermocouple, C.A 861

Thermo-hygrometer C.A 846

USB-Bluetooth adapter

DataView® software

1.3. REPLACEMENT PARTS

2 straight/right-angle safety leads (red and black) 1.50 m long

2 crocodile clips (red and black)

2 test probes (red and black)

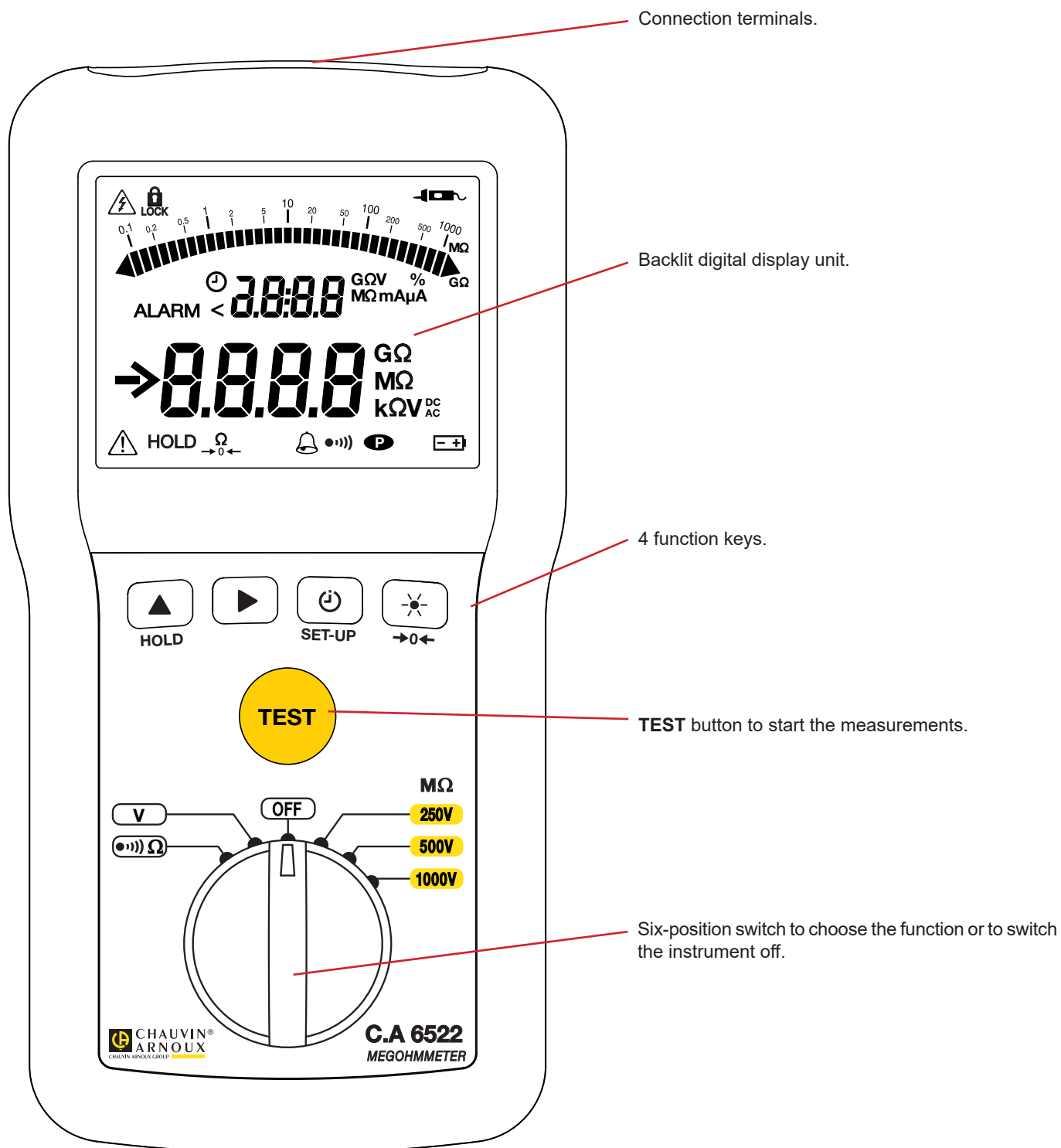
Carrying case that also allows hands-free use

For accessories and spare parts, visit our website:

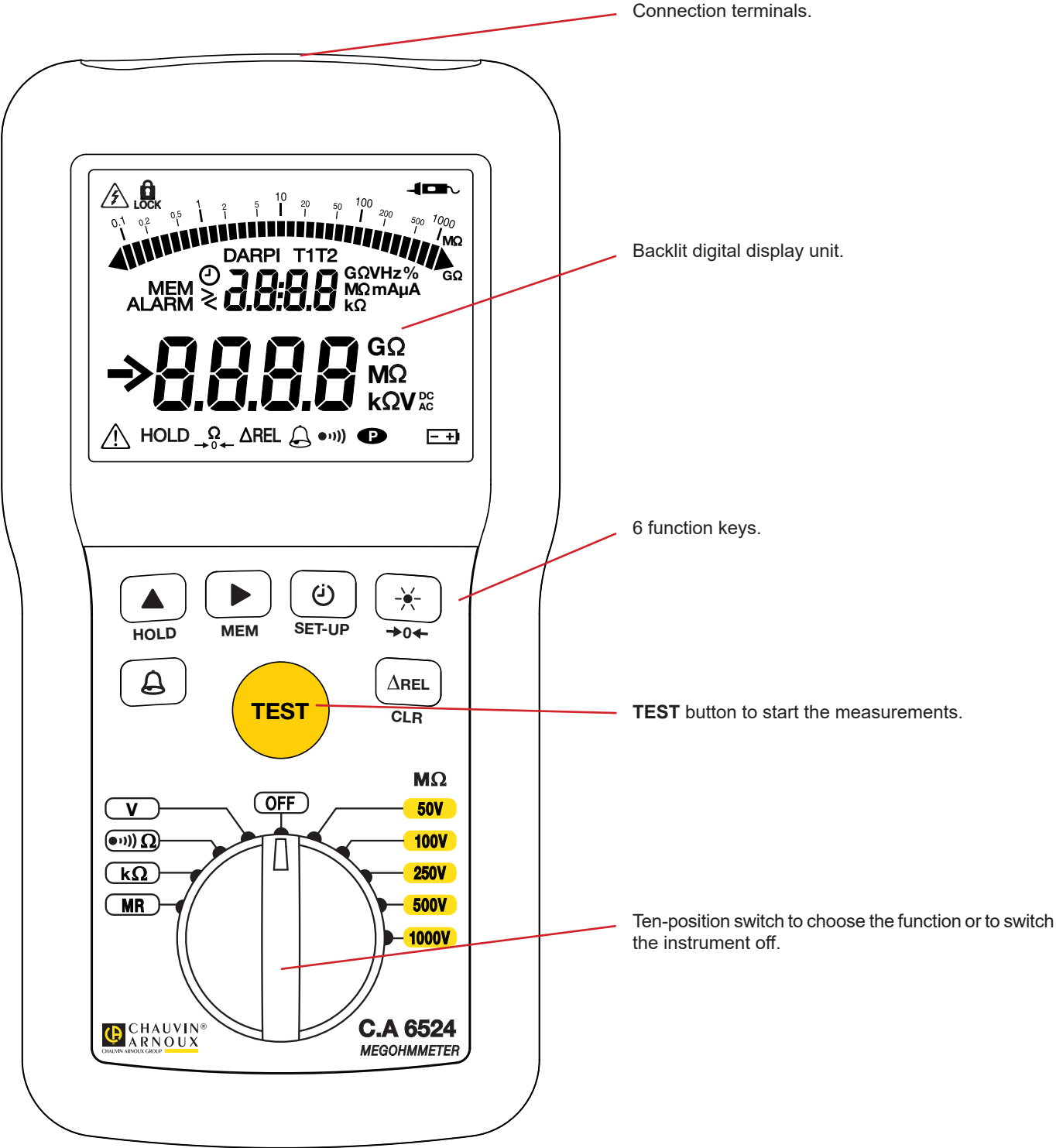
www.chauvin-arnoux.com

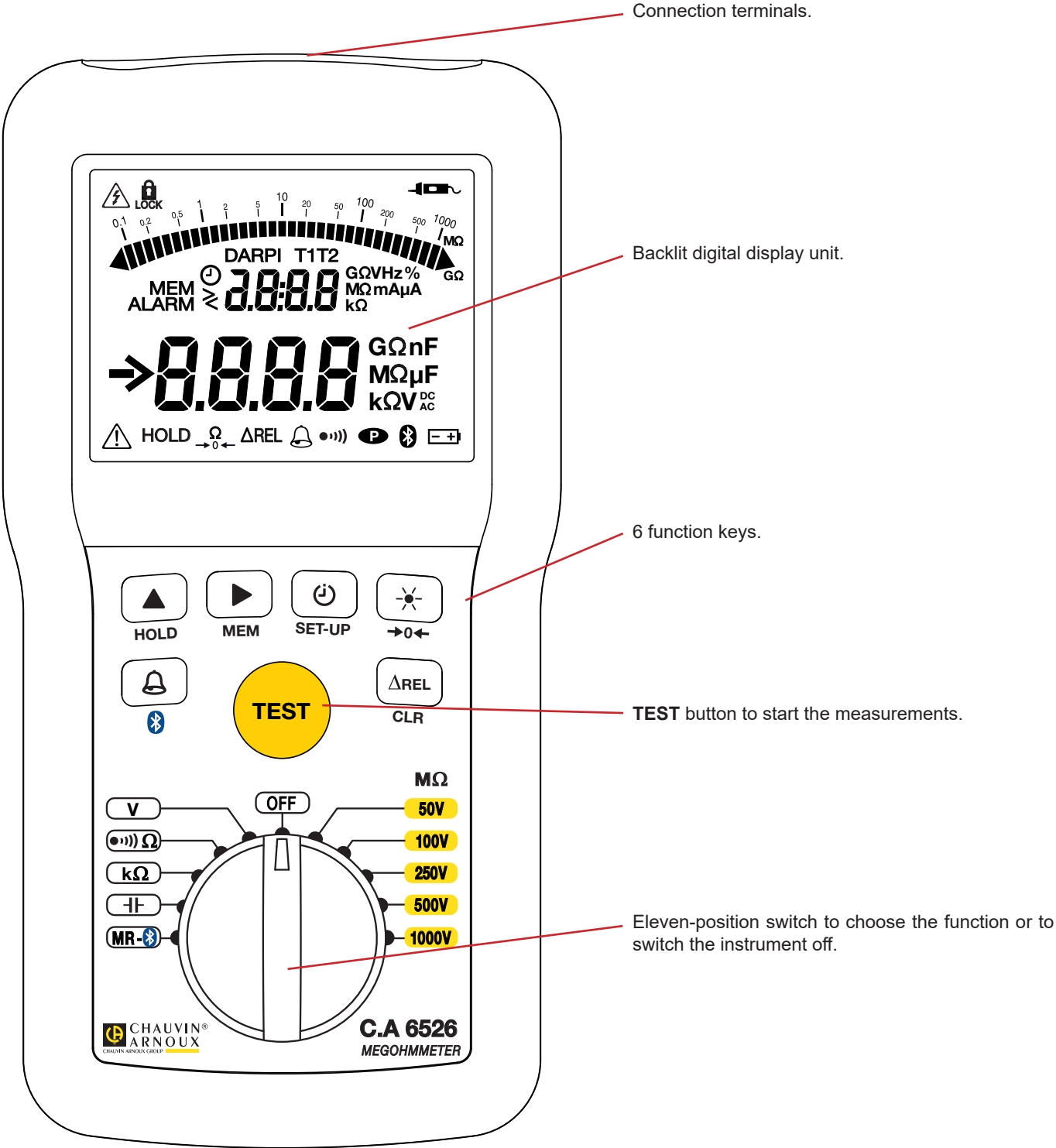
1.4. DESCRIPTION OF THE INSTRUMENTS

1.4.1. C.A 6522

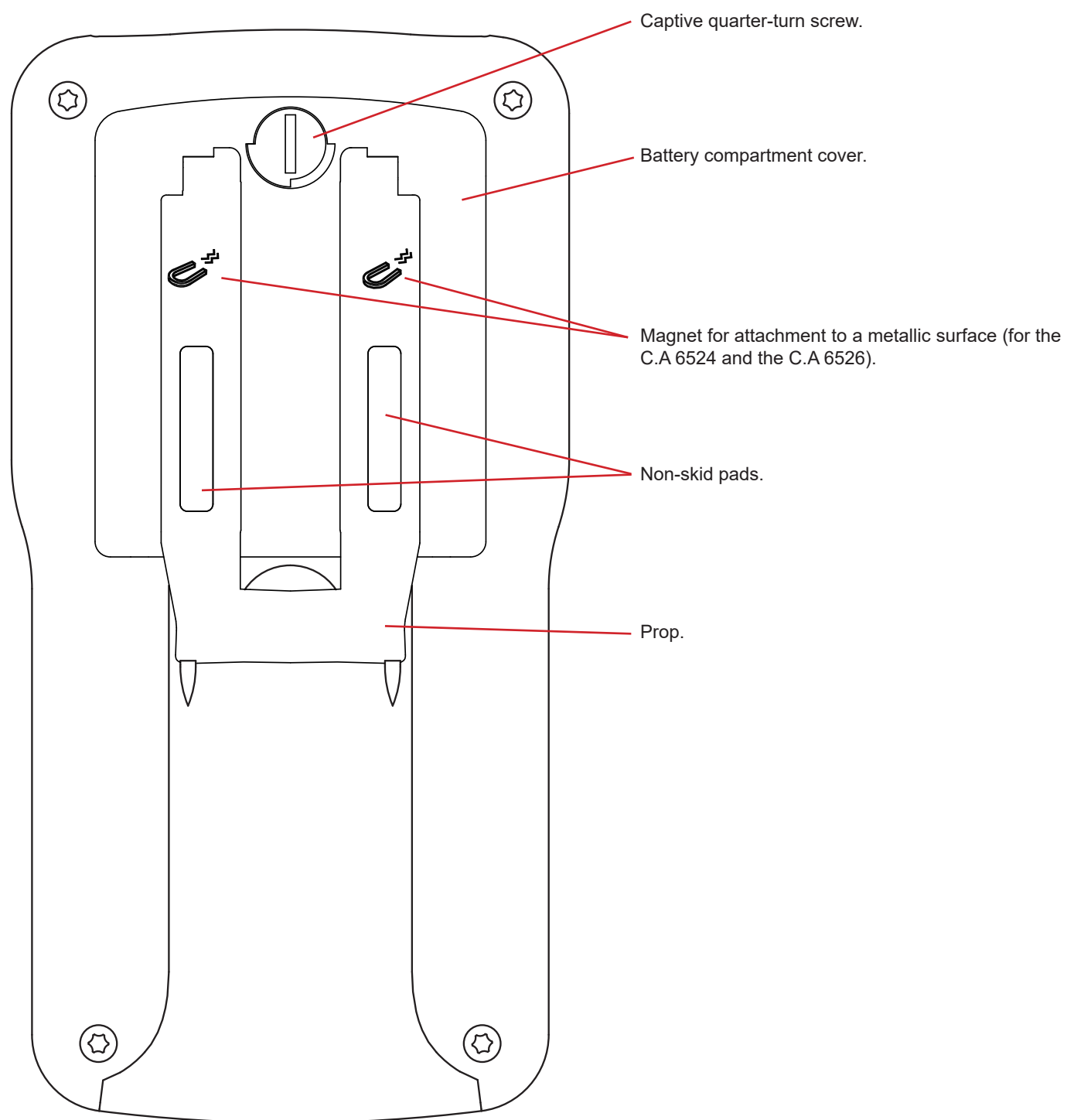


1.4.2. C.A 6524



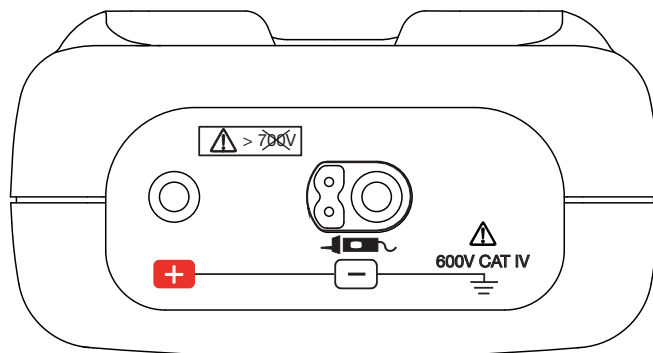


1.4.4. ON THE BACK



1.5. TERMINAL BLOCK

The terminal block has one + terminal and one - terminal that can be used to connect the remote control probe (optional accessory).



1.6. FUNCTIONS OF THE INSTRUMENT

C.A 6522, C.A 6524, and C.A 6526 megohmmeters are portable measuring instruments with digital displays. They are powered by batteries.

These instruments are used to check the safety of electrical installations. They are used to test new installations before they are powered up, to check an existing installation in a power-off condition, or again to troubleshoot an installation.

	C.A 6522	C.A 6524	C.A 6526
Test voltages for insulation measurements	250V - 500V - 1,000V	50V - 100V - 250V - 500V - 1,000V	50V - 100V - 250V - 500V - 1,000V
Calculation of ratios PI and DAR	×	✓	✓
Continuity measurement	✓	✓	✓
Resistance measurement	×	✓	✓
Programmable alarms	×	✓	✓
Frequency measurement	×	✓	✓
Capacitance measurement	×	×	✓
Storage of the measurements	×	✓	✓
Bluetooth	×	×	✓

In continuity testing, the instruments are protected against external voltages without a fuse.

1.7. TEST BUTTON

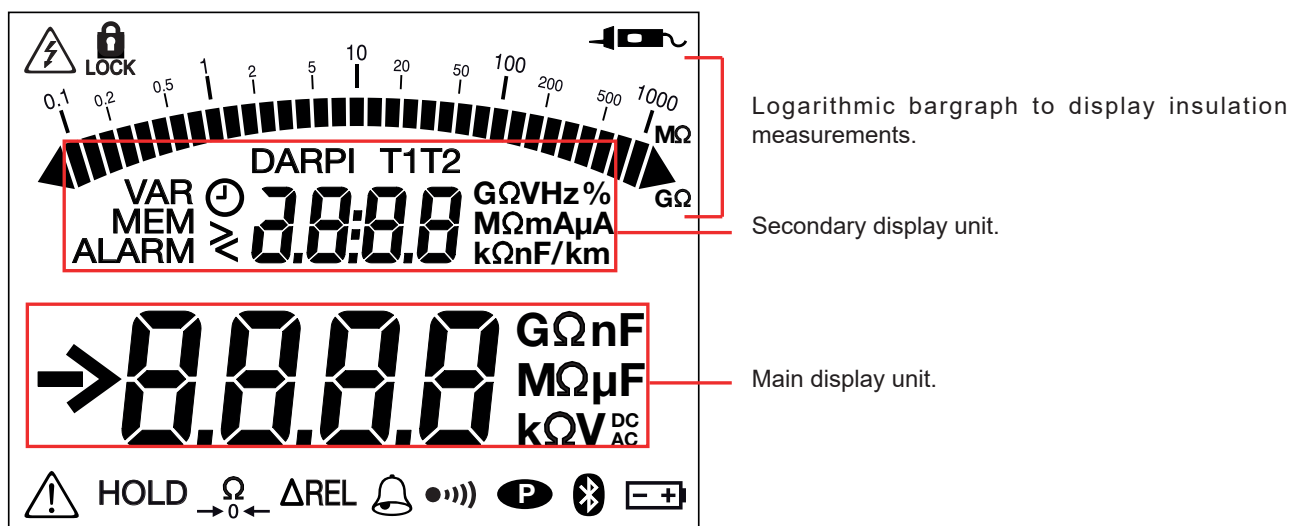
The **TEST** button is used to make insulation measurements.

1.8. FUNCTION KEYS

In general, the keys have a first function, marked on the key, obtained by a short press, and a second function, marked under the key, obtained by a long press.

Key	Function
	The TIMER key is used to select the LOCK, PI, and DAR functions.
	The key is used to switch the display unit backlighting on and off.
HOLD	The HOLD key is used to freeze, then unfreeze, the display of the measurement.
SET-UP	The SET-UP key is used to access the parameters and information of the instrument.
→0←	The →0← key is used to apply compensation for the resistance of the measurement leads in continuity testing.
	On the C.A 6524 and C.A 6526, the ALARM key is used to activate or deactivate the alarms. On the C.A 6526, the ALARM key has a two-colour (green and red) indicator to report overshoots of alarm thresholds.
▲ and ►	The ▲ and ► keys serve: ■ to modify the display and to program the durations of insulation measurements, ■ to choose the continuity test current, ■ and to program the alarm thresholds (on the C.A 6524 and C.A 6526).
ΔRel	On the C.A 6524 and C.A 6526, the ΔRel key is used to display the measurement from which a stored reference measurement is subtracted.
MEM	On the C.A 6524 and C.A 6526, the MEM key is used to record measurements.
CLR	On the C.A 6524 and C.A 6526, the CLR key is used to erase recorded measurements.
	On the C.A 6526, the Bluetooth key is used to transfer data recorded in the memory of the instrument to a computer using the Bluetooth wireless connection. The Bluetooth link also serves to start insulation measurements from the PC.

1.9. DISPLAY



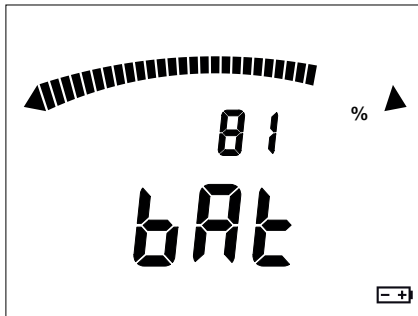
When the measured value is below the minimum, the instrument displays - - - - .

In voltage measurement, when the measurement exceeds the limit (either positive or negative), the instrument displays OL or -OL.

2. USE

2.1. GENERAL

At start-up, the instrument indicates the remaining battery life.



If the battery voltage is too low to ensure correct operation of the instrument, it so reports.



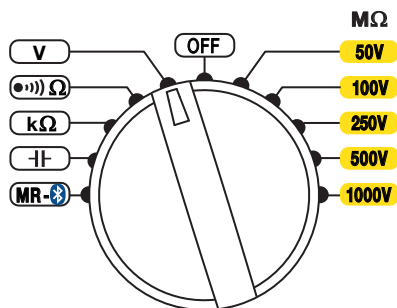
The batteries must then be replaced (see § 4.2), since the battery life indication is no longer reliable.



Except for the voltage measurement, all measurements are made on devices in the power-off condition. It is therefore necessary to check that there is no voltage on the device to be tested before making a measurement.

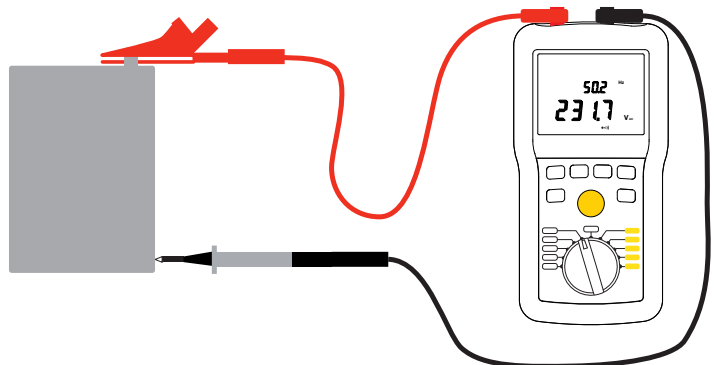
2.2. VOLTAGE MEASUREMENT

Set the switch to **V** or to one of the **MΩ** positions.

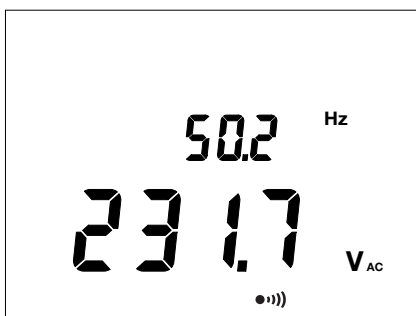


Start by making sure of the proper operation of the voltage measurement, by measuring a known voltage before each use. For example on a power outlet.

Then, using the leads, connect the device to be tested to the terminals of the instrument.



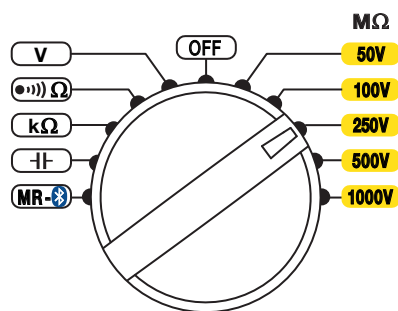
The instrument displays the voltage on the terminals. It detects whether the voltage is AC or DC and, if it is AC, displays its frequency (on the C.A 6524 and the C.A 6526).



In the **MΩ** settings, the  symbol indicates that the voltage is too high (> 25 V) and that insulation measurements are prohibited.

If the voltage is > 15 V, continuity, resistance, and capacitance measurements are prohibited.

2.3. INSULATION MEASUREMENT

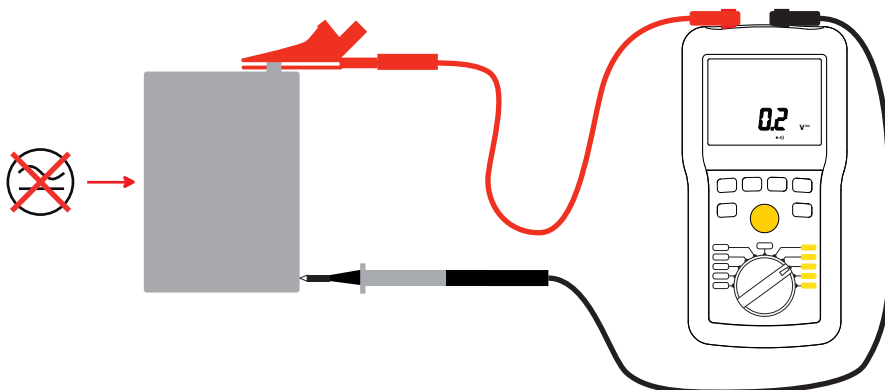


Set the switch to one of the **MΩ** positions.

The test voltage you should choose depends on the voltage of the installation to be tested. For example, for a network installation at 230 V, insulation measurements will be made at 500 V.

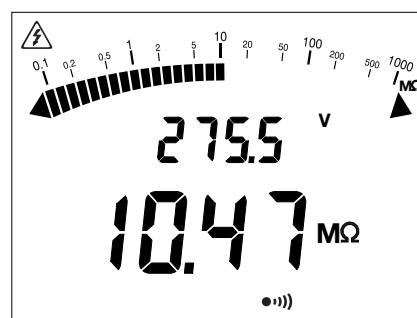
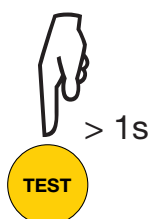
Use the leads to connect the device to be tested to the terminals of the instrument. The device to be tested must not be live.

Pressing the ► key, before or during the measurement, changes the secondary display unit to display the current (on the C.A 6524 and C.A 6526) or the elapsed time.



Press the **TEST** button and hold it down until the measurement displayed is stable.
If a voltage greater than 25 V is detected, pressing the **TEST** button has no effect.

The measurement is displayed on the main display unit and on the bargraph.
The secondary display unit indicates the test voltage generated by the instrument.



The ⚡ symbol indicates that the instrument is generating a hazardous voltage (> 70 V).



The measurement results can be thrown off by the impedances of additional circuits connected in parallel or by transient currents.

At the end of the measurement, release the **TEST** button. The instrument stops generating the test voltage and discharges the device being tested. The ⚡ symbol is displayed until the voltage on the device has fallen below 70 V.



Do not disconnect the leads and do not start any measurement while the symbol ⚡ is displayed.

When you release the **TEST** button, the measurement results remain displayed (**HOLD**) until the next measurement, or the **HOLD** key is pressed, or the instrument is switched off.

2.3.1. OPERATION OF THE TEST BUTTON

The **TEST** button is pressed to make an insulation measurement. The test voltage is generated for as long as the press is maintained. When the button is released, the measurement stops.

In the **lock** mode, simply press the **TEST** button once to start the measurement, then press it a second time to stop; there is no need to keep the button pressed. However, if you forget to stop the measurement, it will stop automatically after 15 minutes.

In the timed test mode (⌚, DAR, PI), simply press the **TEST** button once to start the measurement; it will stop automatically at the end of the programmed time.

2.3.2. TIMER KEY ⌚

This key is active only for insulation measurements.

1 st press	 LOCK	This function is used to lock the TEST button so as not to have to keep it pressed during the insulation measurement.
2 nd press	 2:00	This function is used to program a test duration between 1 and 39:59 minutes. Use the ▶ and ▲ keys to modify the value displayed. When the time is displayed, press the ▶ key to enter programming mode. When the first digit blinks, you can change it using the ▲ key. Press ▶ to go to the next digit and ▲ to change it. Press ▶ one last time to validate.
3 rd press	PI T2 10:00	The PI function is used to calculate the polarization index, which is the ratio of the measurement at T2 = 10 minutes to the measurement at T1 = 1 minute.
4 th press	DAR T2 1:00	The DAR function is used to calculate the dielectric absorption ratio, which is the ratio of the measurement at T2 = 1 minute to the measurement at T1 = 30 seconds.
5 th press		Exit from the function.

When one of the 3 functions, ⌚, PI, or DAR, is programmed, pressing the **TEST** button triggers the count down from the programmed time. When the time has elapsed, the measurement stops and the result is displayed.



Successive presses on the ▲ key display intermediate values.

For ⌚ :

- the programmed time, the voltage and current at the end of the measurement.

For PI and DAR:

- time T1 and the voltage, current, and insulation resistance at that time.
- time T2 and the voltage, current, and insulation resistance at that time.

Interpretation of the results

DAR	PI	Condition of insulation
$\text{DAR} < 1,25$	$\text{PI} < 2$	Poor or even dangerous
$1,25 \leq \text{DAR} < 1,6$	$2 \leq \text{PI} < 4$	Good
$1,6 \leq \text{DAR}$	$4 \leq \text{PI}$	Excellent

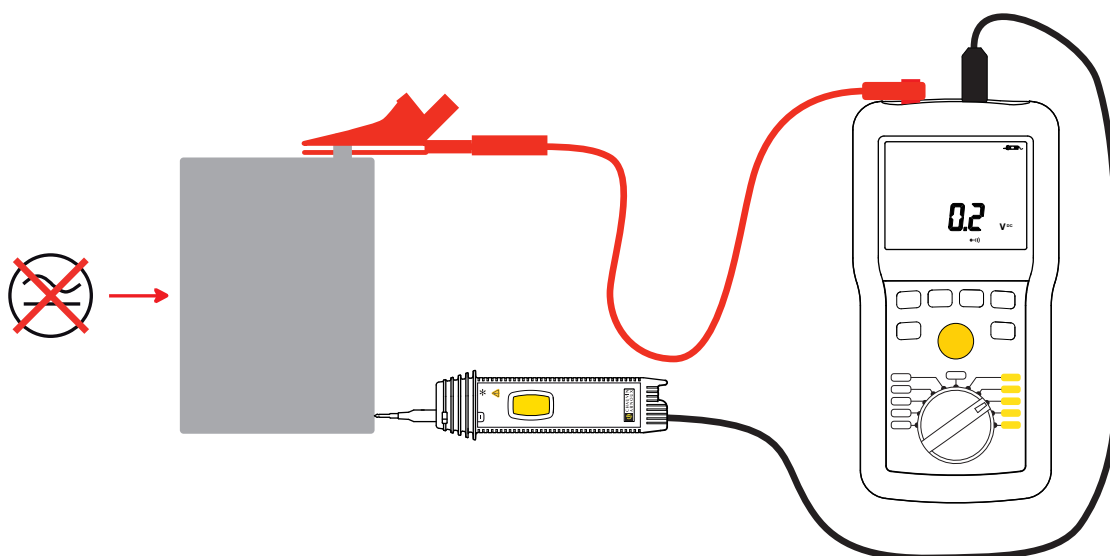


Press the **TEST** key to return to the voltage measurement.



2.3.3. REMOTE CONTROL PROBE (OPTION)

The remote control probe is used to trigger the measurement using the remoted **TEST** button on the probe. To use this accessory, refer to its operating instructions.



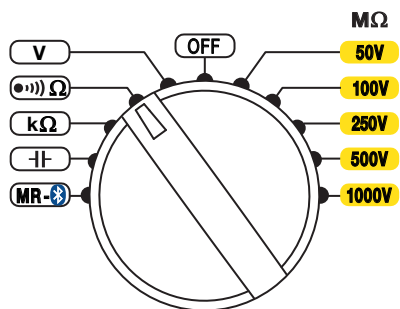
When the probe is connected, the  symbol is displayed.

2.4. CONTINUITY MEASUREMENT

The continuity measurement measures a low resistance (< 10 or 100Ω depending on the current) at a high current (200 or 20 mA).

Set the switch to $\bullet \cdot \cdot \cdot \Omega$.

Press the $\blacktriangleright$ key to choose current measurement.



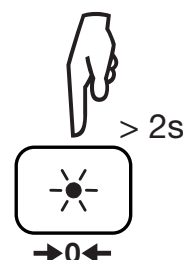
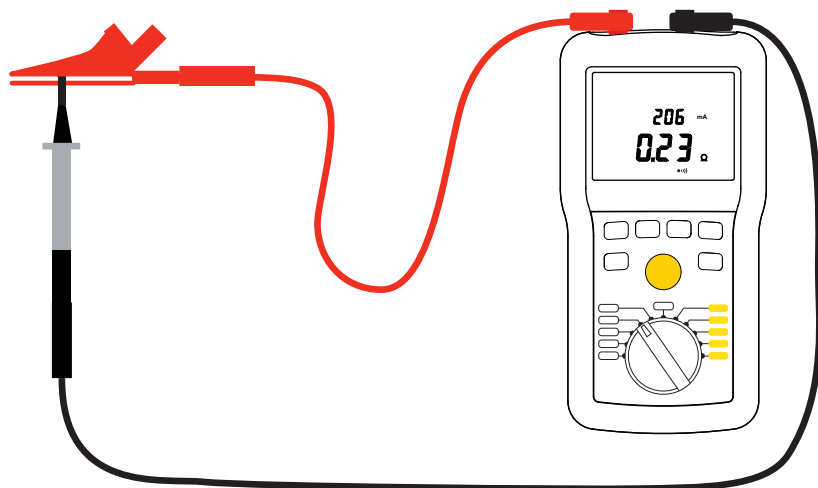
The standard requires that the measurements be made at 200 mA. But a current of 20 mA reduces the consumption of the instrument and so increases its battery life.

The C.A 6522 can make measurements only at 200 mA.

2.4.1. COMPENSATION OF THE LEADS

To ensure precise measurements, it is necessary to compensate the resistance of the measurement leads.

Short-circuit the measurement leads and long-press the $\rightarrow 0 \leftarrow$ key.



The display changes to zero and the $\rightarrow 0 \leftarrow$ symbol is displayed. The resistance of the leads will be systematically subtracted from all continuity measurements. If the resistance of the leads is $> 10 \Omega$, there is no compensation.



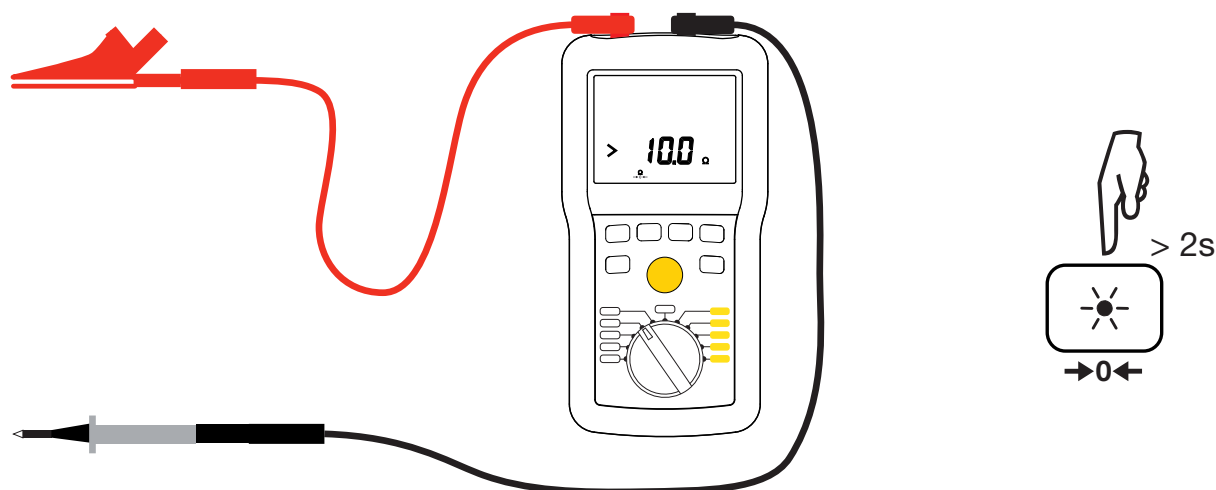
The compensation remains in memory until the instrument is switched off. The continuity measurement range is reduced by the stored compensation value.



If the leads are changed with no change of compensation, the display may become negative. The instrument reports that the compensation must be redone by displaying $\rightarrow 0 \leftarrow$ blinking.

2.4.2. ELIMINATION OF THE COMPENSATION OF THE LEADS

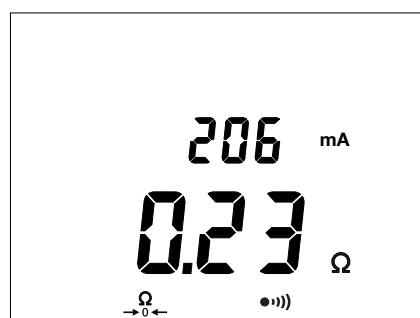
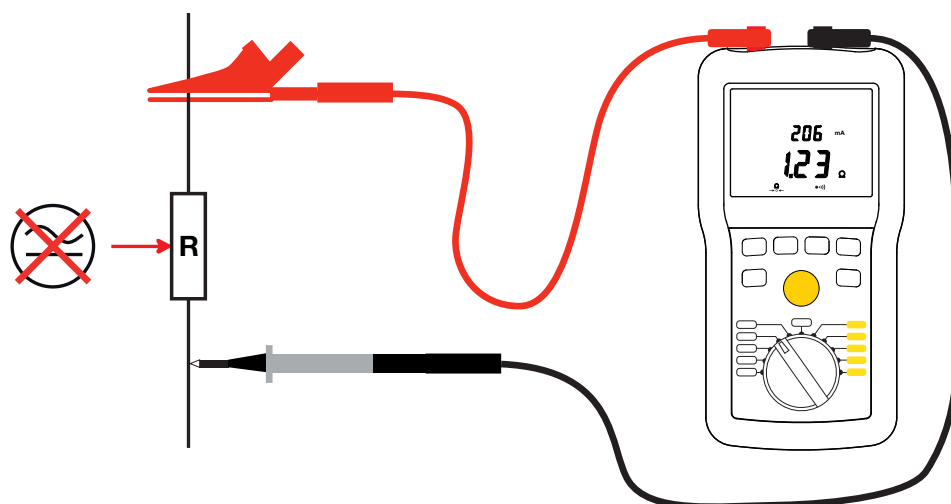
To eliminate the compensation of the leads, leave the leads open and long-press the $\rightarrow 0 \leftarrow$ key.



The display indicates the resistance of the leads and the $\rightarrow 0 \leftarrow$ symbol goes off.

2.4.3. MAKING A MEASUREMENT

Use the leads to connect the device to be tested to the terminals of the instrument. The device to be tested must not be live.



The instrument makes the measurement directly. It displays the result and the measurement current.

To obtain a continuity value per standard IEC 61557:

- Make a measurement at 200 mA and note its value, R_1 .
- Then reverse the leads and note the value R_2 .
- Calculate the mean: $R = \frac{R_1 + R_2}{2}$

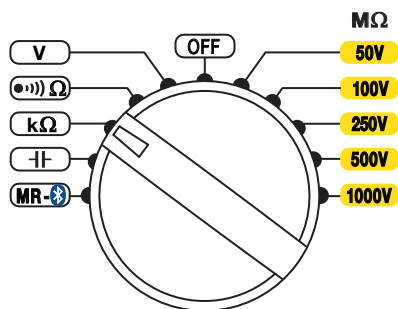


If an external voltage $> 15 \text{ V}$ appears during the continuity measurement, the instrument is protected without a fuse. The continuity measurement is stopped and the instrument reports an error until the voltage disappears.

2.5. RESISTANCE MEASUREMENT (C.A 6524 AND C.A 6526)

The resistance measurement is made with a weak current and can measure resistances up to 1000 k Ω .

Set the switch to **k Ω** .

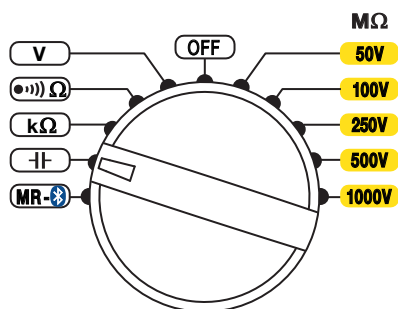


As for a continuity measurement, connect the device to be tested to the terminals of the instrument. The device to be tested must not be live (see § 2.4.3).

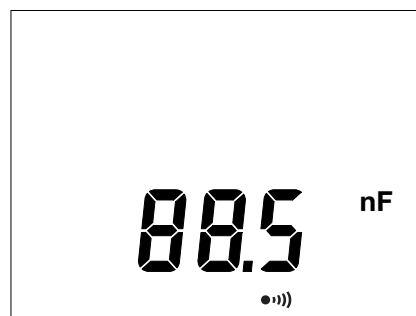


2.6. CAPACITANCE MEASUREMENT (C.A 6526)

Set the switch to **⌚**.



As for a continuity measurement, connect the device to be tested to the terminals of the instrument. The device to be tested must not be live (see § 2.4.3).

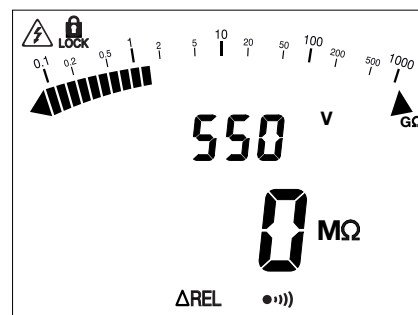
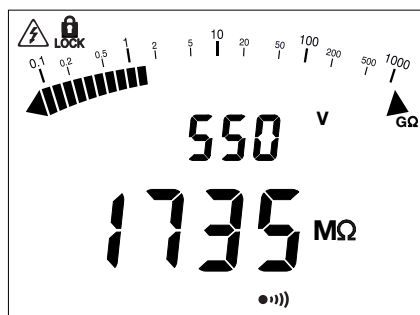


2.7. ΔREL FUNCTION (C.A 6524 AND C.A 6526)

For an insulation, resistance, or capacitance measurement, it is possible to subtract a reference value from the measured value and display the difference.

To do this, make a measurement, then press the **ΔREL**. The measurement (Rref) is stored and subtracted from the present measurement (Rmeas).

The main display changes to zero and the **ΔREL** symbol is displayed.

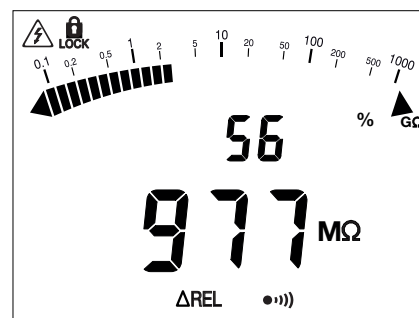


If the measured value is less than the stored value, the display becomes negative.



Pressing the ► key displays, in addition, the measured value as a % of the stored value.

$$\frac{R_{\text{meas}} - R_{\text{ref}}}{R_{\text{ref}}} \times 100$$



In insulation measurements, only the digital display is modified by the **ΔREL**. The bargraph continues to display the true measured value.

To exit from the **ΔREL** function, it is necessary to press the **ΔREL** key again or turn the switch.

2.8. HOLD FUNCTION



Pressing the **HOLD** key freezes the display of the measurement. This can be done in all functions except voltage in the **MΩ** setting.

To unfreeze the display, press the **HOLD** key again.

It is not possible to effect a **HOLD** in a timed measurement (⌚, DAR, PI).

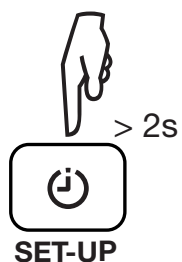
2.9. BACKLIGHTING



Pressing the ☀ key switches on the backlighting of the display unit.

To switch it off, press the ☀ key again. Otherwise, it goes off by itself at the end of one minute.

2.10. SET-UP



A long press on the SET-UP key is used to enter the configuration (set-up) function of the instrument.

Then use the ▲ and ► keys to scroll and modify the parameters.

1 st press on ▲		The buzzer is active. To deactivate it, press ► to make On blink, ▲ to change it to OFF , then ► to validate the change. The ●))) symbol disappears from the display when Set-up is exited.
2 nd press on ▲		Automatic switching off is activated. To deactivate it, press ► to make OFF blink, ▲ to change it to On , then ► to validate the change. The P symbol appears on the display when Set-up is exited.
3 rd press on ▲		Display of the type of instrument.
4 th press on ▲		Display of the internal software version.
5 th press on ▲		Display of the version of the boards.
6 th press on ▲		Return to the first press.

To exit from configuration, short-press the **SET-UP** key.

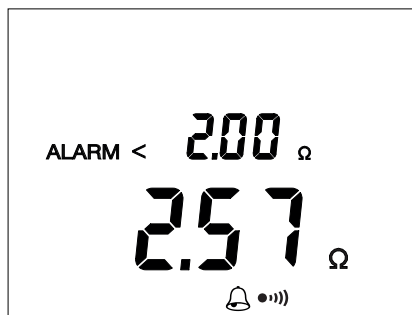
The de-activations of the buzzer and of automatic switching off are lost when the instrument is off.

2.11. ALARM FUNCTION

On the C.A 6522, in continuity testing, pressing the  symbol is displayed, along with the threshold, which is 2 Ohms. If the measurement is below this threshold and the buzzer is active, the instrument emits an audible signal.

On the C.A 6524 and the C.A 6526, pressing the  key activates the alarm. The alarm function is available in insulation, resistance, and continuity measurements.

The  symbol is displayed, along with the threshold, on the secondary display unit.



While it is displayed, you can change this value using the  key, except during insulation measurements. For each position of the switch, there are 3 pre-recorded threshold values:

- in continuity: < 2 Ω, < 1 Ω and < 0.5 Ω.
- in resistance: > 50kΩ, > 100kΩ and > 200kΩ.
- in insulation
 - 50V : < 50 kΩ, < 100 kΩ and < 200 kΩ.
 - 100V : < 100 kΩ, < 200 kΩ and < 400 kΩ.
 - 250V : < 250 kΩ, < 500 kΩ and < 1 MΩ.
 - 500V : < 500 kΩ, < 1 MΩ and < 2 MΩ.
 - 1000V : < 1 MΩ, < 2 MΩ and < 4 MΩ.



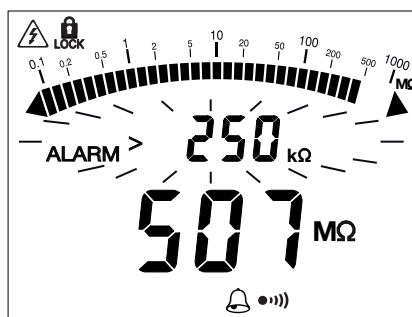
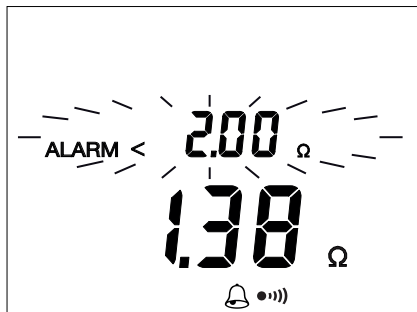
The third threshold can be replaced by a user-programmed value.

If you want a specific threshold value, press the  key to enter the programming function, while the threshold value is displayed.

The > symbol starts blinking; you can change it to < using the  key. This symbol indicates the direction of the alarm threshold: < for a low threshold and > for a high threshold.

Press the  key again to go to the first digit, then to the decimal point, then to the second digit, etc. down to the unit, and one final time on the  key to validate the programming of the threshold.

When the alarm threshold is crossed, i.e. when the measurement is below the low alarm threshold or above the high alarm threshold, the instrument emits a continuous audible signal and the secondary display unit displays the crossing of the threshold.



In the example above, the user can thus check that their continuity measurement is indeed less than 2 Ω, just by listening, without looking at the display unit. They can check insulation quality in the same way.

On the C.A 6526, the  key is green when the alarm threshold has not been crossed and red when it has. In continuity, it is the other way round. This enables the user to check the measurement at a glance.

The **HOLD** key is also used to stop the buzzer after an alarm threshold is crossed.

A second press on the  key deactivates the alarm.

2.12. AUTOMATIC STOP

After 5 minutes of operation with no sign of the user's presence (key press or rotation of the switch), the instrument switches to standby.

Simply press any key to exit from standby. The instrument returns to the state it was in, with no loss information: value of the last measurement, compensation of the leads, ΔRel , timed mode, alarm, etc.

Automatic switching off is disabled during:

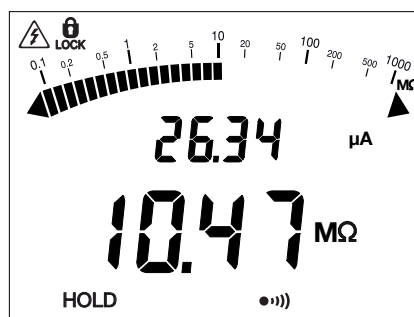
- insulation measurements in  mode and in timed mode (, PI, or DAR).
- continuity measurements, for as long as measurements are made.

This automatic switching off can be disabled (see § 2.10).

2.13. STORAGE (C.A 6524 AND C.A 6526)

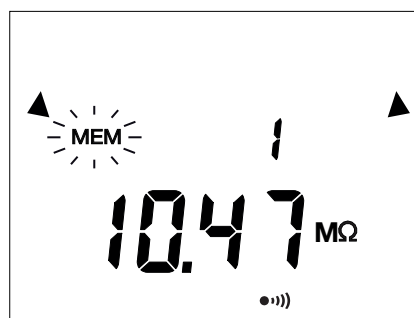
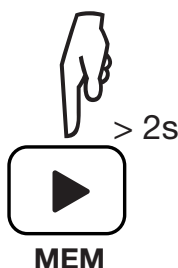
2.13.1. RECORDING A MEASUREMENT

To record a measurement, it is first necessary to freeze the display using the **HOLD** key or to wait for the end of a timed measurement. In insulation measurements, the measurement must be stable enough to be frozen.



Then long-press the **MEM** key to store the measurement.

The measurement is recorded in the first memory slot available (here, number 1).

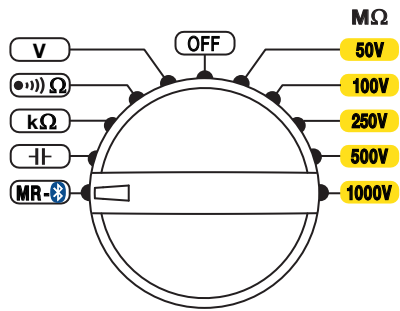


It is recorded with all information tied to it but not necessarily displayed at the time of storage: voltage, current, duration of tests T1 and T2 in the case of PI and DAR, etc.

The bargraph indicates the level of filling of the memory.

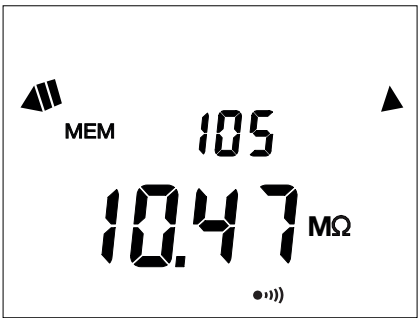
2.13.2. REREADING THE RECORDS

Set the switch to **MR**.

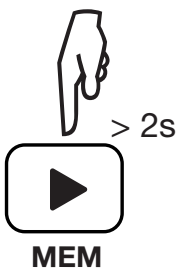


To see the other measurements, press the ▲ key. The record number is decremented and the corresponding measurement is displayed.
To scroll rapidly through the recorded measurements, keep the ▲ key pressed.

The instrument displays the last measurement recorded.



To see one particular measurement, use the ► key to change the record number.

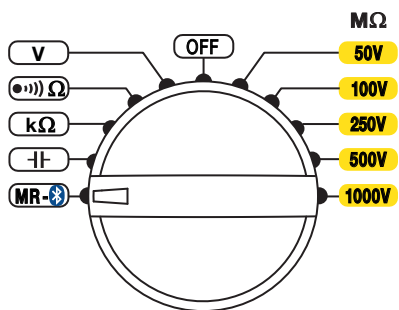


Once the record number has been chosen, you can see all information concerning the measurement. Long-press the **MEM** key, then use the ▲ key to scroll the information.

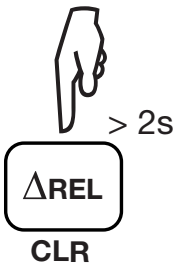
To exit from this rereading of records, long-press **MEM** again.

2.13.3. ERASING ONE RECORD

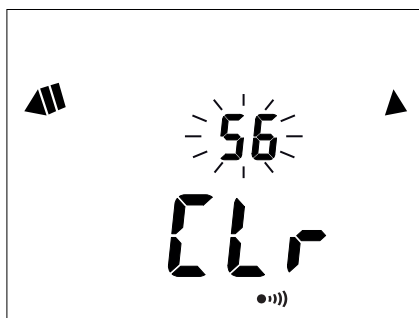
Set the switch to **MR**.



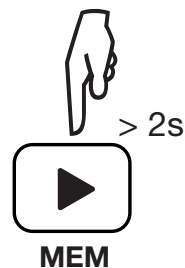
Use the ▲ and ►, keys to select the number of the record to be erased.
Then long-press the **CLR** key.



The record number blinks and the main display unit displays **CLR**.



Then long-press the **MEM** key to confirm the erasure.



Otherwise, to cancel, long press the **CLR** key again.

2.13.4. ERASING ALL RECORDS

Repeat the record erasure procedure:

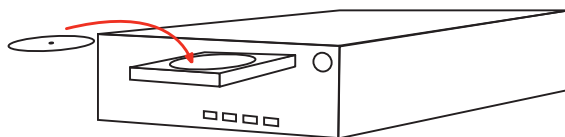
- Set the switch to **MR**.
- Long-press the **CLR** key.
- Press the **▲** key and the record number is replaced by **ALL**.
- To cancel, long-press the **CLR** key again.
- Otherwise, to confirm the erasure of all records, long-press the **MEM** key.

The instrument then reports that the memory is empty.

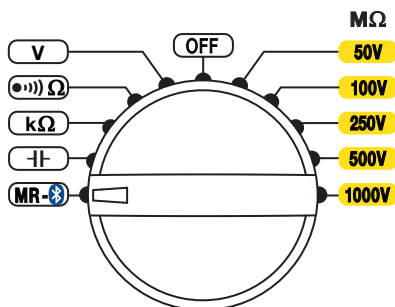


2.14. BLUETOOTH COMMUNICATION (C.A 6526)

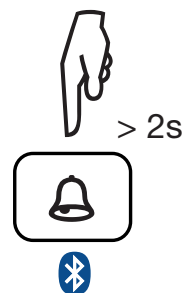
Before connecting your instrument for the first time, install the MEG software delivered with it.



Set the switch to **MR** .

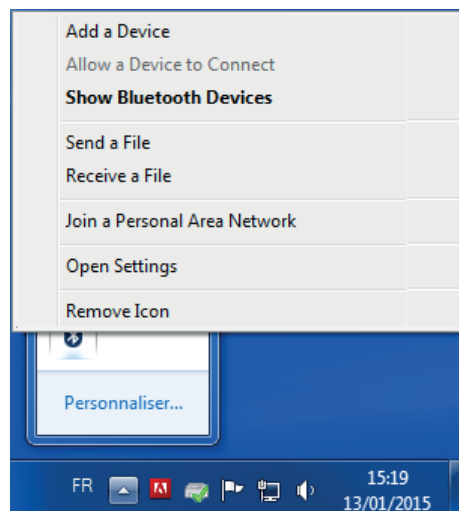
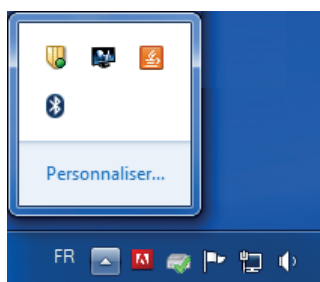


Then long-press the  key.

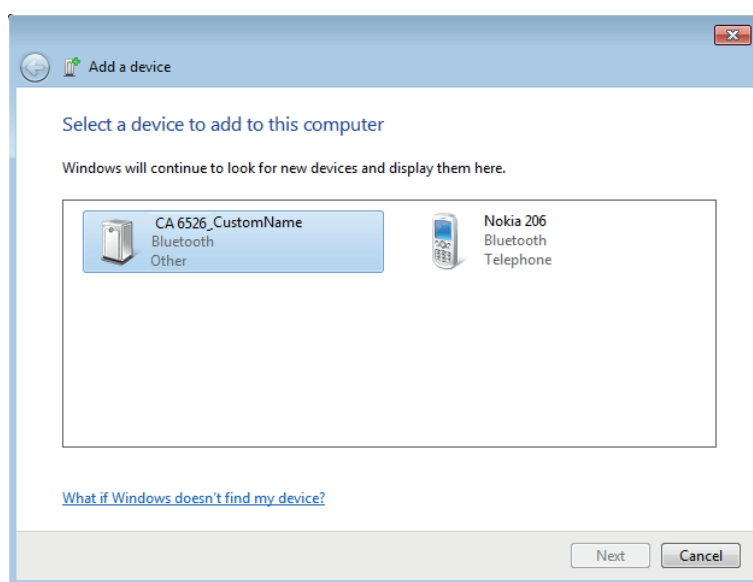


The  symbol is displayed and the instrument waits for a message from the computer. When the link is set up, the  symbol starts blinking.

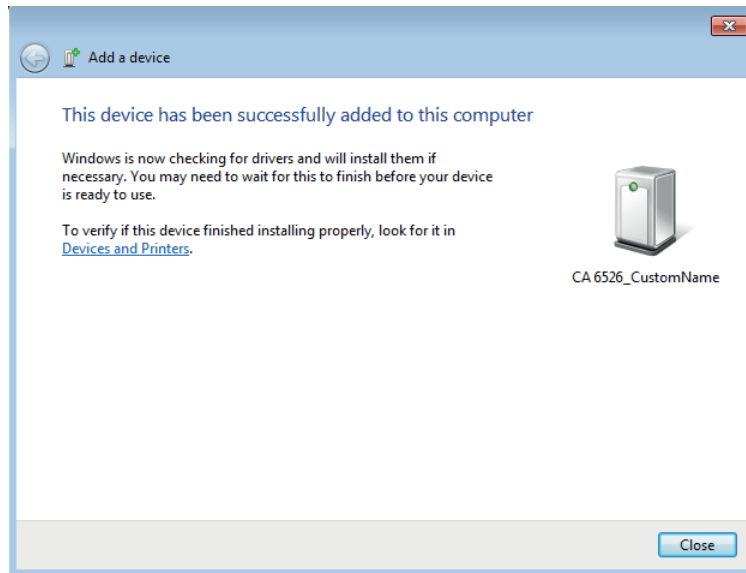
If your PC does not have a Bluetooth port, install a USB-Bluetooth adapter. Then, in the Windows bar, locate the Bluetooth logo, right-click on it, and choose **Add a peripheral**.



The PC searches its environment for Bluetooth-compatible devices. When the megohmmeter is detected, select it and click **Next**.



If a coupling code is requested, enter 1111.



You can then transfer recorded data from the instrument to the computer. If you turn the switch to an insulation position, you can transmit the measurements in real time.

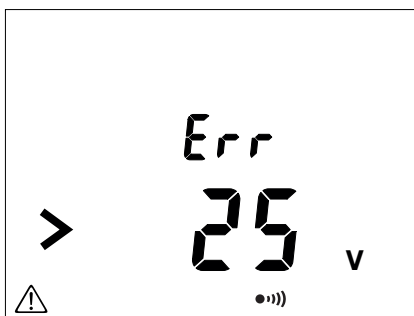
To use the MEG software, refer to its help function.

To exit from the Bluetooth connection, long-press the  key again, whatever the setting of the switch.

2.15. ERRORS

While the instrument is in operation, errors may be reported. The causes of any errors must be eliminated before the instrument can be used again.

2.15.1. PRESENCE OF A VOLTAGE BEFORE AN INSULATION MEASUREMENT



Before the insulation measurement, the instrument is in voltage measurement mode. If there is a voltage on the terminals in excess of 25 V and you try even so to make a measurement, the instrument reports the situation.

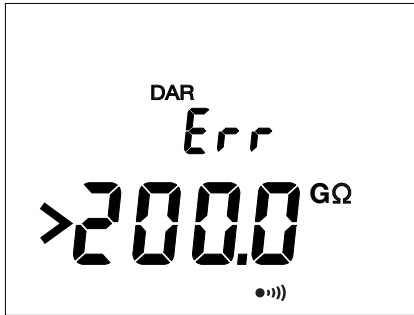
Eliminate the voltage and resume the measurement.

2.15.2. OVERSHOOT OF RANGE DURING AN INSULATION MEASUREMENT



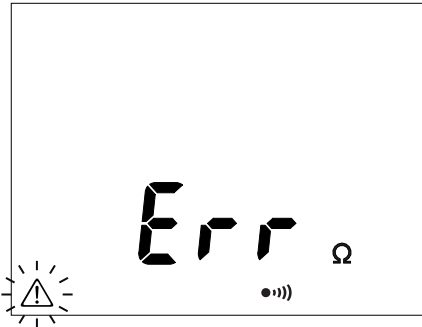
If, during an insulation measurement, the value to be measured exceeds the measurement range (which depends on the instrument and the test voltage), the instrument so reports.

In the case of a C.A 6524 or C.A 6526 in the 1000 V range, that leads to display of the screen shown opposite.



With the C.A 6524 or C.A 6526, if this occurs during a DAR or PI measurement, the instrument interrupts the measurement and displays the screen shown opposite.

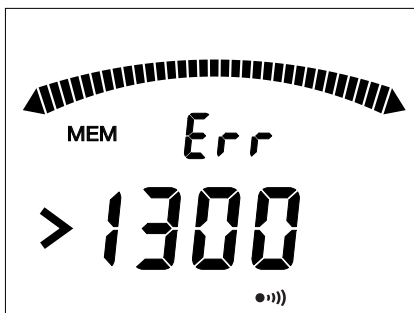
2.15.3. PRESENCE OF A VOLTAGE DURING A CONTINUITY, RESISTANCE, OR CAPACITANCE MEASUREMENT



If, during a continuity, resistance, or capacitance measurement, the instrument detects an external voltage in excess of 15 V (AC or DC), it interrupts the measurement and displays the screen shown opposite.

You must eliminate the voltage to be able to resume the measurement.

2.15.4. MEMORY FULL (C.A 6524 AND C.A 6526)



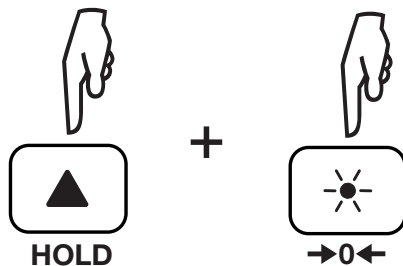
When the memory is full (300 records for the C.A 6524; 1300 for the C.A 6526), it is no longer possible to record measurements and the instrument displays the screen shown opposite.

Records must then be erased before new measurements can be recorded.

2.16. RESETTING THE INSTRUMENT

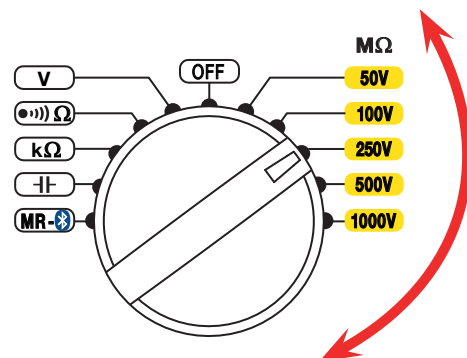
If your instrument crashes, it can be reset like a PC.

Press the ▲ and ☀ keys simultaneously.



The instrument reboots.

Then turn the switch.



3. TECHNICAL CHARACTERISTICS

3.1. GENERAL REFERENCE CONDITIONS

Quantity of influence	Reference values
Temperature	23 ± 3 °C
Relative humidity	45 to 55% RH
Frequency	DC and 45 to 65 Hz
Supply voltage	8 ± 0.2V battery life indication 58 ± 8%
Electric field	0V/m
Magnetic field	< 40A/m

The **intrinsic uncertainty** is the error specified for the reference conditions.

The **operating uncertainty** includes the intrinsic uncertainty plus variations of the quantities of influence (position, supply voltage, temperature, etc.) as defined in standard IEC-61557.

The uncertainties are expressed in % of the reading (R) and in number of display points (ct):
 $\pm (a \%R + b \text{ ct})$

3.2. ELECTRICAL CHARACTERISTICS

3.2.1. VOLTAGE MEASUREMENTS

Particular reference conditions

Peak factor = 1.414 in AC, sinusoidal signal

Specified measurement range	0.3 - 399.9V	400 - 700V
Resolution	0.1V	1V
Intrinsic uncertainty	$\pm (3\% + 2 \text{ ct})$	
Input impedance	400k Ω	
Frequency ranges	DC and 15.3 at 800Hz	

3.2.2. FREQUENCY MEASUREMENTS

Measurement range	15.3 - 399.9Hz	400 - 800Hz
Resolution	0.1Hz	1Hz
Intrinsic uncertainty	$\pm (1\% + 2 \text{ ct})$	$\pm (1.5\% + 1 \text{ ct})$

3.2.3. INSULATION MEASUREMENT

Particular reference conditions

Capacitance in parallel on resistance: null

Measurement ranges as a function of the model of instrument

Test voltage	C.A 6522	C.A 6524	C.A 6526
50V		10 k Ω - 10 G Ω	10 k Ω - 10 G Ω
100V		20 k Ω - 20 G Ω	20 k Ω - 20 G Ω
250V	50 k Ω - 10 G Ω	50 k Ω - 50 G Ω	50 k Ω - 50 G Ω
500V	100 k Ω - 20 G Ω	100 k Ω - 100 G Ω	100 k Ω - 100 G Ω
1,000V	200 k Ω - 40 G Ω	200 k Ω - 200 G Ω	200 k Ω - 200 G Ω

Intrinsic uncertainty

Test voltage (U_N)	50V - 100V - 250V - 500V - 1,000V					
Specified measurement range	10 - 999 k Ω and 1.000 - 3.999 M Ω	4.00 - 39.99 M Ω	40.0 - 399.9 M Ω	400 - 3999 M Ω	4.00 - 39.99 G Ω	40.0 - 200.0 G Ω
Resolution	1k Ω	10k Ω	100k Ω	1M Ω	10M Ω	100M Ω
Intrinsic uncertainty	■ For $U_N = 50V$: $\pm (3\% + 2 \text{ ct} + 2\%/G\Omega)$ ■ For $U_N = 100V$: $\pm (3\% + 2 \text{ ct} + 1\%/G\Omega)$ ■ For $U_N = 250V$: $\pm (3\% + 2 \text{ ct} + 0.4\%/G\Omega)$ ■ For $U_N = 500V$: $\pm (3\% + 2 \text{ ct} + 0.2\%/G\Omega)$ ■ For $U_N = 1,000V$: $\pm (3\% + 2 \text{ ct} + 0.1\%/G\Omega)$					

Whatever the test voltage, for an insulation resistance $\leq 2 \text{ G}\Omega$, the intrinsic uncertainty is $\pm (3\% + 2 \text{ ct})$.

Bargraph

Specified measurement range	0.1 MΩ - 200 GΩ *
Resolution	9 segments per decade
Intrinsic uncertainty	$\pm (5\% + 1 \text{ segment})$

*: When the measurement range is exceeded, the whole bargraph is displayed.

Test voltage

With a test current $< 1 \text{ mA}$, the intrinsic uncertainty on U_N is $-0\% + 20\%$.

Specified measurement range	0.0 - 399.9V	400 - 1,250V
Resolution	0.1V	1V
Intrinsic uncertainty	$\pm (3\% + 3 \text{ ct})$	

Typical discharge time after test

To go from U_N to 25 V, the discharge time is $< 2\text{s}/\mu\text{F}$

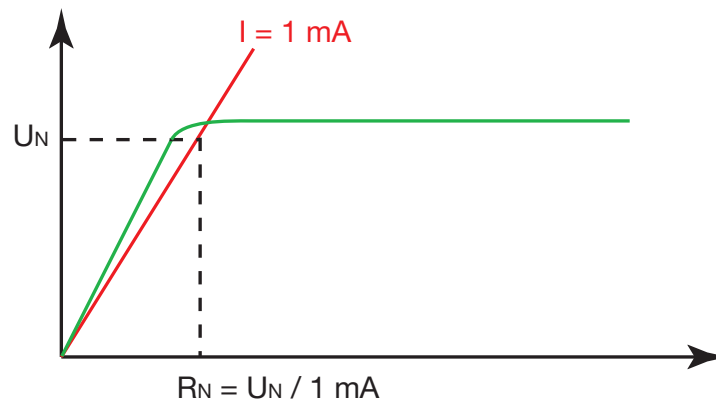
Test current

Maximum test current: 2mA +0% -50%

Specified measurement range	0.01 - 39.99 μA	40.0 - 399.9 μA	0.400 - 2.000mA
Resolution	10nA	100nA	1 μA
Intrinsic uncertainty	$\pm (10\% + 3 \text{ ct})$		

Typical test voltage vs load curve

The voltage as a function of the measured resistance takes the following form:



The range of operation per IEC 61557 is from 100k Ω to 2 G Ω (see § 3.4).

3.2.4. CONTINUITY MEASUREMENTS

Particular reference conditions

Inductance in series with the resistance: zero.

Specified measurement range (without compensation of the leads)	0.00 * - 10.00 Ω	0.0 * - 100.0 Ω
Resolution	10m Ω	100m Ω
Intrinsic uncertainty	$\pm (2\% + 2 \text{ ct})$	
Test current	200mA	20mA
No-load voltage	$\geq 6V$	

*: In the case of incorrect compensation of the leads, the instrument allows display of negative values, down to -0.05 Ω at 200 A and -0.5 Ω at 20 mA.

Test current

200 mA range: 200mA (-0mA + 20mA)

20 mA range: 20mA $\pm$ 5mA

Specified measurement range	0 - 250mA
Resolution	1mA
Intrinsic uncertainty	$\pm (2\% + 2 \text{ ct})$

Compensation of the leads: 0 to 9.99 Ω .

3.2.5. RESISTANCE MEASUREMENTS (C.A 6524 AND C.A 6526)

Specified measurement range	0 - 3999 Ω	4.00 - 39.99 k Ω	40.0 - 399.9 k Ω	400 - 1000 k Ω
Resolution	1 Ω	10 Ω	100 Ω	1 k Ω
Intrinsic uncertainty	$\pm (3\% + 2 \text{ ct})$			
No-load voltage	approximately 4.5V			

3.2.6. CAPACITANCE MEASUREMENTS (C.A 6526)

Specified measurement range	0.1 - 399.9nF	400 - 3999nF	4.00 - 10.0 μ F
Resolution	0.1nF	1nF	10nF
Intrinsic uncertainty	$\pm (3\% + 2 \text{ ct})$		

3.2.7. TIMER

Specified measurement range	0:00 - 39:59
Resolution	1s
Intrinsic uncertainty	$\pm 1\%$

3.2.8. STORAGE

Number of records:

- 300 for the C.A 6524
- 1300 for the C.A 6526.

3.2.9. BLUETOOTH

Bluetooth 2.1

Class II

Range 10 metres

3.3. VARIATION IN THE RANGE OF USE

3.3.1. VOLTAGE MEASUREMENT

Quantities of influence	Range of influence	Quantity influenced	Influence	
			Typical	Maximum
Temperature	-20 to + 55 °C	V, F		0.3%/10 °C + 1 ct
Relative humidity	20 to 80% RH	V, F		1% + 2 ct
Frequency	15.3 to 800Hz	V	1%	2% + 1 ct
Supply voltage	6.6 to 9.6V	V, F		0.1% + 2 ct
Common mode rejection in AC 50/60 Hz	0 to 600Vac	V	50dB	40dB

3.3.2. INSULATION MEASUREMENT

Quantities of influence	Range of influence	Quantity influenced	Influence	
			Typical	Maximum
Temperature	-20 to + 55 °C	$M\Omega$ $R \leq 3G\Omega$ $3G\Omega < R < 10G\Omega$ $10G\Omega \leq R$	1%/10°C + 1pt	2%/10 °C + 2 ct 3%/10 °C + 2 ct 4%/10 °C + 2 ct
		U_N : 50 to 500V U_N : 1,000V		0.5%/10 °C + 1 ct 1%/10 °C + 1 ct
		Measurement current	1%/10 °C + 1 ct	2%/10 °C + 2 ct
Relative humidity	20 to 80% RH	$M\Omega$	2% + 1 ct	3% + 2 ct
		U_N : 50 to 1,000V		1% + 2 ct
		Measurement current		1% + 2 ct
Supply voltage	6.6 to 9.6V	$M\Omega$		0.1% + 2 ct
50/60Hz AC voltage superposed on the test voltage (U_N)		50V range $R \leq 0.1G\Omega$: 4V from 0.1G Ω to 1G Ω : 0.2V		5% + 2 ct
		100V and 250V ranges from 100k Ω to 10M Ω : 20V from 10M Ω to 1 G Ω : 0.3V		
		500V and 1,000V ranges from 500k Ω to 50M Ω : 20V from 50M Ω to 3 G Ω : 0.3V		

Quantities of influence	Range of influence	Quantity influenced	Influence	
			Typical	Maximum
Capacitance in parallel on resistance to be measured	0 to 5 μ F at 1mA	M Ω		1% + 1 ct
	0 to 2 μ F	50V, 100V and 250V ranges from 10k Ω to 3 G Ω	6% + 2 ct	10% + 2 ct
		500V and 1,000V ranges from 100k Ω to 10G Ω	6% + 2 ct	10% + 2 ct
	0 to 1 μ F	50V range, $\leq$ 5G Ω 250V range, $\leq$ 15G Ω 1,000V range, $\leq$ 100G Ω	6% + 2 ct	10% + 2 ct
Common mode rejection in AC 50/60 Hz	0 to 600VAc	V	50dB	40dB

3.3.3. RESISTANCE AND CONTINUITY MEASUREMENT

Quantities of influence	Range of influence	Quantity influenced	Influence	
			Typical	Maximum
Temperature	-20 to + 55 °C	at 200mA		2%/10 °C + 2 ct
		at 20mA		2%/10 °C + 2 ct
		R		1%/10 °C + 2 ct
Relative humidity	20 to 80% RH	at 200mA		4% + 2 ct
		at 20mA		4% + 2 ct
		R		3% + 2 ct
Supply voltage	6.6 to 9.6V	at 200mA at 20mA R		0.1% + 2 ct
50/60Hz AC voltage superposed on the test voltage	0.5VAc	at 200mA		5% + 10 ct
	For R $\geq$ 10 Ω : 0.4VAc	at 20mA		
	Accepts no perturbations	R		
Common mode rejection in AC 50/60 Hz	0 to 600VAc	at 200mA at 20mA R	50dB	40dB

3.3.4. CAPACITANCE MEASUREMENT (C.A6526)

Quantities of influence	Range of influence	Quantity influenced	Influence	
			Typical	Maximum
Temperature	-20 to + 55 °C	μ F	0.5%/10 °C + 1 ct	1%/10 °C + 2 ct
Relative humidity	20 to 80% RH	μ F		1% + 2 ct
Supply voltage	6.6 to 9.6V	μ F		0.1% + 2 ct
50/60Hz AC voltage superposed on the test voltage	0.5VAc	μ F		5% + 2 ct
Common mode rejection in AC 50/60 Hz	0 to 600VAc	μ F	50dB	40dB

3.4. INTRINSIC UNCERTAINTY AND OPERATING UNCERTAINTY

The megohmmeters comply with standard IEC-61557, which requires that the operating uncertainty, called B, be less than 30%.

- In insulation measurements, $B = \pm (|A| + 1.15 \sqrt{E_1^2 + E_2^2 + E_3^2})$
with
A = intrinsic uncertainty
E₁ = influence of the reference position $\pm 90^\circ$.
E₂ = influence of the supply voltage within the limits indicated by the manufacturer.
E₃ = influence of the temperature between 0 and 35°C.

- In continuity measurement, $B = \pm (|A| + 1.15 \sqrt{E_1^2 + E_2^2 + E_3^2})$

3.5. POWER SUPPLY

The instrument is powered by six 1.5 V alkaline AA (LR6) batteries.
The voltage range ensuring correct operation is from 6.6 V to 9.6 V.

Life between charges

- 1,500 5-second insulation measurements at 1000V for R = 1 MΩ, at the rate of one measurement per minute.
- 3,000 5-second continuity measurements, at the rate of one measurement per minute.

3.6. ENVIRONMENTAL CONDITIONS

Indoor use.

Range of operation specified	-20 to +55 °C and 20 to 80 %RH
Range of storage (without the batteries)	-30 to +80 °C and 10 to 90 %RH without condensation
Altitude	<2000m
Degree of pollution	2

3.7. MECHANICAL CHARACTERISTICS

Dimensions (L x W x H)	211 x 108 x 60mm
Weight	approximately 850g

Inrush protection	IP 54 per IEC 60529, not in operation IK 04 per IEC 50102
-------------------	--

Drop test	per IEC/EN 61010-2-030 or BS EN 61010-2-030
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3.8. COMPLIANCE WITH INTERNATIONAL STANDARDS

The device is compliant per IEC/EN 61010-2-034 or BS EN 61010-2-034, 600V CAT IV.

The device is compliant per EC 61557, parts 1, 2, 4 and 10.

3.9. ELECTROMAGNETIC COMPATIBILITY (CEM)

The instrument is compliant with standard IEC/EN 61326-1 or BS EN 61326-1.

4. MAINTENANCE



Except for the batteries, the instrument contains no parts that can be replaced by personnel who have not been specially trained and accredited. Any unauthorized repair or replacement of a part by an "equivalent" may gravely impair safety

4.1. CLEANING

Disconnect the unit completely and turn the rotary switch to OFF.

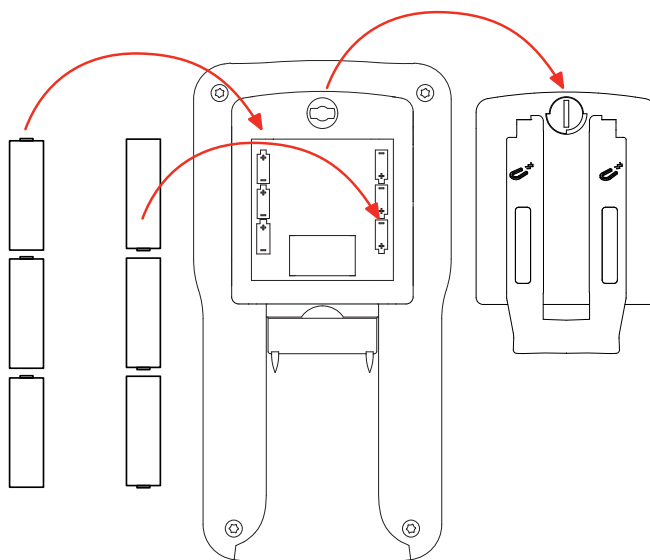
Use a soft cloth, dampened with soapy water. Rinse with a damp cloth and dry rapidly with a dry cloth or forced air. Do not use alcohol, solvents, or hydrocarbons.

Do not use the instrument again until it is completely dry.

4.2. REPLACING THE BATTERIES

When the  symbol starts blinking on the display unit, the batteries must all be replaced.

- Disconnect the unit completely and turn the rotary switch to OFF.
- Use a tool or a coin to turn the quarter-turn screw of the battery compartment cover.
- Remove the battery compartment cover.
- Withdraw the batteries from the compartment.



Spent primary and storage batteries must not be treated as ordinary household waste. Take them to the appropriate collection point for recycling.

- Place the new batteries in the compartment, taking care with the polarity.
- Put the battery compartment cover in place and screw the quarter-turn screw back in.

5. WARRANTY

Except as otherwise stated, our warranty is valid for **24 months** starting from the date on which the equipment was sold. Extract from our General Conditions of Sale provided on request.

The warranty does not apply in the following cases:

- Inappropriate use of the equipment or use with incompatible equipment;
- Modifications made to the equipment without the explicit permission of the manufacturer's technical staff;
- Work done on the device by a person not approved by the manufacturer;
- Adaptation to a particular application not anticipated in the definition of the equipment or not indicated in the user's manual;
- Damage caused by shocks, falls, or floods.

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INTERNATIONAL

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Fax : +33 1 46 27 95 69

Our international contacts

www.chauvin-arnoux.com/contacts



CA 6505, CA 6545, CA 6547 & CA 6549

5kV insulation testers



Checking and maintenance of electrical machines and equipment



- Large measurement range from 10 k Ω to 10 T Ω
- Large backlit LCD screen, with digital display and bargraph
- Fixed test voltages and programmable test voltages from 40 V to 5,100 V
- Quantitative and qualitative insulation analysis
- Automatic calculation of the DAR / PI / DD quality ratios
- Step voltage mode
- Calculation of the result R at a reference temperature

1000 V
CAT III

IP53

IEC
61557



Measure up



Performance in the field...

In a hard casing which is site-adapted for the most severe measuring conditions, the CA 6545, CA 6547 and CA 6549 megohmmeters offer the very best in insulation testing technology and accuracy.

They measure voltages, frequencies, capacitance and residual current on installations or equipment. Their multiple functions not only qualify the measured insulation, but also provide real preventive maintenance.

Site-proof casing
with sealed (IP 53)
shock resistant cover

Socket for AC mains
connection and
internal NiMH battery
charger

Folding handle
for storing



USB for connection to a PC
or printing via a terminal
(CA 6547 & CA 6549)

Backlit graphic
display with messages,
symbols and bargraph



CA 6545 and CA 6547
with giant LCD screen

Accessories for all measurement conditions



The CA 6505, CA 6545, CA 6547 and CA 6549 megohmmeters are delivered as standard with a bag and leads 3 m long terminated by built-in isolated HV crocodile clips.

The shape of these HV crocodile clips is optimized for perfect contact when connected to objects with different geometrical forms.

Available as an option: simplified cables terminated by a 4 mm banana plug for plugging in small crocodile clips or test probes.

In-depth expertise...

Main applications

- Insulation measurement on cables, motors, generators, transformers, etc.
 - 2 levels of diagnostics:
 - "Go/No go" measurement
 - Qualitative measurement for preventive maintenance:
 - Testing with programmed duration
 - Quality ratios: polarization index (PI) & dielectric absorption ratio (DAR)
 - Insulation testing on heterogeneous or multi-layer cables (dielectric discharge index (DD))
 - Ramp by voltage steps
- Locking of test voltages: ideal when entrusting the instrument to less experienced users
- Measurement voltage selectable from 40 to 5,100 V to deal with all types of measurement situations
- Possibility of storing the results in the memory and exporting the data by means of software to keep a log of the measurements (CA 6547 / CA 6549).

"THEORETICAL" REMINDER

Reduced insulation may be due to slow, gradual deterioration over a long period of time, but may also result from sudden damage.

The effects of humidity, dirt, corrosion, penetration by chemicals and even vibrations can all cause this sort of deterioration.

Its effects are easy to document using the quality ratios (PI-DAR-DD) available on the whole range of 5 Kv insulation testers

Comparison of the insulation values over time provides crucial information for preventive maintenance of machines.



POLARIZATION INDEX (PI) & DIELECTRIC ABSORPTION RATIO (DAR)

Insulation is sensitive to temperature and humidity variations. In addition, measurement is affected by the appearance of disturbance currents. To overcome these effects, long-term measurements must be performed and the PI and DAR coefficients must be calculated. They will then allow qualification of the insulants and their ageing.



DIELECTRIC DISCHARGE INDEX (DD)

This test measures the dielectric absorption of a heterogeneous or multi-layer insulant and will reveal the presence of impurities or a faulty layer.

$$DD = \frac{\text{Current measured after 1 min (mA)}}{\text{Test voltage (V) x Capacitance measured (F)}}$$



Var 50-5,000 V SETTING

To deal with the whole range of measurement situations (electrical equipment, telecom installations, etc.) and measure as accurately as possible, all 3 instruments offer the possibility of selecting the test voltage by means of the Var 50-5,000 V setting on the rotary switch. The voltage can be adjusted between 40 V and 1,000 V in 10 V increments and between 1,000 V and 5,100 V in 100 V increments.



PROGRAMMABLE ALARMS

A high or low alarm threshold can be memorized. If there is an overrun, a visual warning is triggered and a buzzer sounds.



STORAGE (CA 6547 and CA 6549)

The CA 6547 and CA 6549 have an internal memory for storing several thousand measurements. Storage is performed with two indices, OBJ (object) and TEST (test), which store the results in an ordered way.



VOLTAGE-STEP RAMP (CA 6549)

The resistance of a faulty insulant gradually decreases as the test voltage rises. This test, which involves increasing the test voltage in steps, can be used to assess the quality of the insulant by observing the curve R(t) and the result in ppm/V which provides a quantitative evaluation of the curve's slope.



TEST WITH PROGRAMMABLE DURATION

Insulation measurements sometimes take a long time to stabilize because of transient disturbance currents. By carrying out long-term measurements and analysing the trend curve of the insulation according to the test voltage application time, you can obtain a better assessment of insulant quality.



GRAPH R(t)

If a programmed-duration test is carried out, the instruments automatically store the samples concerning the insulation tested, at the rate chosen by the user. The curve R(t) can be plotted by hand on the basis of the results, or on screen via the DATAVIEWER software. With the CA 6549, it is also possible to view the curve directly on the graphic screen.



SMOOTH FUNCTION

When the measurements are unstable, the Smooth function can be used to smooth the display of the insulation values so that they are easier to read and can be interpreted more quickly.



PRINTER (CA 6547 and CA 6549)

A USB serial drive or a PC can be hooked up for transmission to a printer. It is also possible to use a USB printer printing ASCII.



REFERENCE TEMPERATURE (CA 6549)

The value of an insulation resistance varies according to the measurement temperature. For accurate, reliable monitoring, it is always a good idea to express a measurement result in terms of a reference temperature. By simply pressing a button, the calculation can be performed automatically by the instrument.



DATAVIEW SOFTWARE

This software recovers the stored data, plots the trend curve R(t), prints the customized test protocols and creates files for spreadsheet software. DataView can also configure and control the instrument via a USB link!

SPECIFICATIONS

	CA 6505	CA 6545	CA 6547	CA 6549
Metrology				
Insulation	Fixed test voltages: 500 / 1,000 / 2,500 / 5,000 V Adjustable test voltage: 40 V to 5,100 V in 10 or 100 V increments Ranges: 500 V: 10 kΩ to 2 TΩ 1,000 V: 10 kΩ to 4 TΩ 2,500 V: 10 kΩ to 10 TΩ 5,000 V: 10 kΩ to 10 TΩ			
Voltage	1 to 5,100 V (15 Hz to 500 Hz or DC) during the test, 1 to 2,500 VDC - 15...500 Hz / 2,500 – 4,000 VDC before the test			
Capacitance	0.001 to 49.99 F			
Leakage current	0.000 nA to 3,000 A			
Functions				
Display	Large graphical LCD			Graphic
Backlighting	Yes			
Programmable alarms	No	Yes		
Smoothing of display	No	Yes		
Prog. test duration	Yes			
Calculation of ratios	DAR - PI	DAR - PI and DD		
Prog. test duration	No			5 steps
Calulation of R referenced T°	No			Yes
Locking of test voltage	Yes			
R(t)	No	Recording of samples		Directly on the display
Storage	No		128 kB	
Communication	No		Two-way	
Printing of measurements	No		Serial or parallel printer PC software	
PC software	No		Megohmmeter Transfer (Standard) - DataView® (option)	
Power supply	Rechargeable NiMH battery			
Battery life	30 days with 10 DARs and 5 Pls / day			
Electrical safety	CEI 61010-2-030 Cat. III 1,000 V or Cat. I 2,500 V) and 61557			
Dimensions	270 x 250 x 180 mm			
Weight	4.3 kg			

To order

CA 6547 megohmmeter.....P01139712

CA 6549 megohmmeter.....P01139713

Delivered with a carrying bag containing:

- 2 HV safety leads, one red and one blue, length 3 m, equipped with an HV plug at one end and an HV crocodile clip at the other end.
- 1 black guarded HV safety lead, length 3 m, equipped with an HV plug with rear connection at one end and an HV crocodile clip at the other end.
- 1 blue guarded HV safety lead, length 0.35 m, equipped with an HV plug at one end and an HV plug with rear connection at the other end.
- 1 mains power cable 1.80 m long
- 8 simplified user's manuals (CA 6547)
- 1 USB drive containing the user's manuals (1 file per language) and the MEG application software
- 1 USB-A / USB-B cable

Replacement parts

- Red guarded high-voltage cable 3 m long with crocodile clip.....P01295510
- Blue guarded high-voltage cable 3 m long with crocodile clip.....P01295506
- Black guarded high-voltage cable 3 m long with crocodile clip.....P01295513
- 1 blue high-voltage cable 0.35 m long with rear connection.....P01295516
- Bag no. 8 for accessories.....P01298066
- Fuse FF 0.1 A - 380 V - 5x20 mm - 10 kA (set of 10).....P03297514
- 9.6 V - 3.5 AH - NiMH rechargeable battery.....P01296021
- 2P mains power cable.....P01295174
- USB type A-B cable.....P01295293
- CA 1821 1-channel TC thermometer - K-J-T-E-N.....P01654821
- CA 1246 thermo-hygrometer.....P01654246

CA 6505 megohmmeter.....P01139714

CA 6545 megohmmeter.....P01139711

Delivered with a carrying bag containing:

- 2 HV safety leads, one red and one blue, length 3 m, equipped with an HV plug at one end and an HV crocodile clip at the other end.
- 1 black guarded HV safety lead, length 3 m, equipped with an HV plug with rear connection at one end and an HV crocodile clip at the other end.
- 1 blue guarded HV safety lead, length 0.35 m, equipped with an HV plug at one end and an HV plug with rear connection at the other end.
- mains power cable 1.80 m long
- 8 simplified user's manuals (CA 6547)
- 1 USB drive containing the user's manuals (1 file per language)

Accessories

- Blue high-voltage cable 8 m long with crocodile clip.....P01295507
- Red high-voltage cable 8 m long with crocodile clip.....P01295511
- Guarded high-voltage cable 8 m long with black crocodile clip with rear connection.....P01295514
- Guarded high-voltage cable 15 m long with blue crocodile clip.....P01295508
- Guarded high-voltage cable 15 m long with red crocodile clip.....P01295512
- Guarded high-voltage cable 15 m long with black crocodile clip with rear connection.....P01295515



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Изх. № BGR 1013 / 07.10.2022 г.

До: "АЕЦ Козлодуй" ЕАД
Управление "Търговско"
Отдел "Маркетинг и доставки"На вниманието на: Христо Пачев - Гл. експерт маркетинг
тел.: + 359 973 7 6140
е-mail: HPatchev@npp.bg
commercial@npp.bgОтносно: **Пазарна консултация № 5039 -**
„Доставка на измервателни прибори"
Обособена позиция № 2 –
„Високоточни мултимери”

Уважаеми г-н Пачев,

Във връзка с Покана за пазарна консултация № 5039 - „Доставка на измервателни прибори" и Обособена позиция № 2 – „Високоточни мултимери" имаме удоволствието да представим нашето

ИНДИКАТИВНО ПРЕДЛОЖЕНИЕ

№	ID	Наименование	Мярка	К-во	Единична Цена в лв. (без ДДС)	Стойност, лв. (без ДДС)
1.	123729	MTX3293B	бр.	1	1720	1720
2.	123840	Sefram 7335	бр.	4	820	3280
3.	127903	P01196803 CA 5293	бр.	1	1435	1435
Общо:						6435

ТЪРГОВСКИ УСЛОВИЯ

Цените са в лева, без ДДС, DDP Козлодуй.

Срок на доставка: 80 календарни дни от датата на заявката.

Гаранционен срок: MTX3293B - 36 месеца/Sefram 7335 - 24 месеца/CA 5293 - 36 месеца.

Плащане: По банков път, до 30 календарни дни от датата на приемане на доставката на основание на данъчна фактура.

Придружаваща документация: Приемо-предавателен протокол; Гаранционна карта, Ръководство за експлоатация.

Адрес за кореспонденция:

УНИТЕХ КОНТРОЛ ЕООД, 1000 гр. София, ул. "Ген. Йосиф В. Гурко" № 48.

Банкови реквизити: Разплащателна сметка: BG 94 UNCR 7630 1077 5989 99.

BIC код Уникредит Булбанк АД: UNCRBGSF

ИН по ЗДДС – BG831758563; ИН по ДОПК – 831758563.

За контакти: Георги Милушев, моб. 088 850 1235; тел./факс: 02 821 04 05,

е-mail: office@unitech-bg.com.

Валидност на офертата: 1 месец от датата на получаване

Приложение: Техническа спецификация.

Заличено на основание 33ЛД

В очакване на Вашия отговор,

УНИТЕХ КОНТРОЛ ЕООД

Изготвил: инж. А. Ангелов

Управител:

/доц. д-р инж. Г. Милушев/

ТЕХНИЧЕСКА СПЕЦИФИКАЦИЯ
За „Доставка на измервателни прибори“
Обособена позиция № 2 – „ Високоточни мултимери”

ID	ID производи тел	Описание на артикула
123729	MTX3293B	Мултимер, Cat IV-600V, Cat III-1000V, с обхвати: Напрежение AC (от 45Hz до 1KHz) до 1000V точност 0,3%, напрежение DC до 1000V точност 0,03%; ток AC (от 45Hz до 1KHz) до 10A кл. точ. ≤0,4%, ток DC до 10A точност 0,4%, съпротивление 50MΩ точност 3%, капацитет до 10mF точност 1.5%, температура (от -200°C до 800°C) точност 0.1%, диоден тест 2,1V точност 2%. Доставка: 1 чанта, 4 броя презареждаеми батерии NI-MH 2,400 mAh 1.5 V, зарядно устройство, измервателни проводници: 1.5 m червен - 1 бр.; 1.5 m черен - 1 бр.; измервателна сонда червена CAT IV 1kV - 1 бр., измервателна сонда черна CAT IV 1kV - 1 бр.; 1 оптичен USB кабел + SX-DMM софтуер, инструкция за експлоатация на CD, инструкция за дистанционно програмиране и инструкция за пускане на уреда - на хартия.
123840	Sefram 7335	Мултимер, Cat IV-600V Cat III-1000V, дисплей с подсветка, 6000 измервания, обхват Udc: 0,01mV-1000V, 0,09%; Uac: 0,01mV-1000V, 1%; Idc: 0.01mA-10A, 1%, Iac: 0.01mA-10A, 1.5%; R: 0.1Ω-40MΩ, C: 1nF-10000μF, резолюция 1nF; F: 0.01Hz-100kHz, 0.1%; T°: -40 - 400°C, резолюция 0.1°C, комплект измервателни кабели (червен - 1 бр., черен - 1 бр.) с накрайници; температурна сонда, ръководство за потребителя, инсталирана батерия 9V - 6F22.
127903	P01196803 CA 5293	Мултимер с обхвати: напрежение AC 0-1000V клас на точност 0,3%, напрежение DC до 1000V клас на точност 0,02%, ток AC до 10A, кл. точ. 0,3%, ток DC до 10A кл. точ. 0,08%, съпротивление 100MΩ, кл. точ. 0,07%, капацитет до 10mF кл. точ. 1 %, температура Pt 100 и TC K (от -200°C до 1200°C) кл. точ. 0,1/1 %, в комплект с кабели, измервателни сонди и накрайници.

LETTER OF AUTHORISATION

WHEREAS SEFRAM INSTRUMENTS SAS who are established and reputable company of electric measuring and testing instruments, having factories at

32 rue Edouard Martel – 42100 ST ETIENNE - FRANCE

do hereby authorize the UNITECH Company who is established in SOFIA (BULGARIA), to submit a bid and subsequently negotiate and sign the contract with you as per your Invitation to Bid against all the goods manufactured and/or supplied by us.

For and on behalf of manufacturer

Saint-Etienne, France

December 6, 2019

SEFRAM Instruments SAS
32, Rue Edouard Martel - B.P. 55
42009 SAINT ETIENNE CEDEX 2

Заличено на основание 33ЛД

ROGER MARENTHIER
Directeur Commercial

MANUFACTURER'S AUTHORIZATION LETTER

Date: 02/04/2021

To: UniTech Control Ltd

WHEREAS **CHAUVIN ARNOUX GROUP** who are established and reputable manufacturers of portable measuring instruments having headquarter at CHAUVIN ARNOUX 12-16 Rue Sarah Bernhardt, 92600 Asnières-sur-Seine, France do hereby authorize:

The Bidder: NPP Kozloduy

Address: 3321 Kozloduy Bulgary

Tel : +359 973 7 20 20

Fax: + 359 973 7 60 73

to purchase, to resell and to supply portable measuring instruments manufactured by our company.

Best regards,

Заличено на основание 33ЛД

p.o: Mr. Contant.

M. Philippe CONTANT

Export Manager

Test and Measurement

CHAUVIN ARNOUX



Пачев, Христо Б.

From: Богоева, Юлия К.
Sent: 10 октомври 2022 г. 8:29
To: Пачев, Христо Б.
Сс: Александров, Пламен Г.; Лазарова, Милена Т.
Subject: FW: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 2 – „Високоточни мултимери”
Attachments: 20221007 Offer High Precision Multimeters.pdf; CA 5293.PDF; MTX3293B.PDF; Sefram 7335.pdf; Chauvin Arnoux_AUTHORIZATION UNITECH CONTROL-NPP.pdf; Authorisation BK-UNITECH SOFIA.pdf

BX-E-5616/10.10.2022

-----Original Message-----

From: office@unitech-bg.com <office@unitech-bg.com>
Sent: Friday, October 7, 2022 6:15 PM
To: commercial <commercial@npp.bg>
Сс: Пачев, Христо Б. <HPatchev@npp.bg>; Office <office@unitech-bg.com>
Subject: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 2 – „Високоточни мултимери”

Уважаеми Колеги,

Във връзка с Пазарна консултация №5039 - „Доставка на измервателни прибори” приложено изпращам:

1. Оферта по Обособена позиция № 2 – „Високоточни мултимери”.
2. Техническа информация за предложените уреди.
3. Оторизационни документи от производителя.

По-подробна информация за уредите може да се види на сайта на Chauvin Arnoux:
https://catalog.chauvin-arnoux.com/fr_en/produits/chauvin-arnoux/multimeters

и на сайта на SEFRAM:
<https://www.sefram.com/en/products/multimeters/7335-6000-counts-digital-and-bargraph-multimeter-trms-ac-dc-accuracy-0-08.html>

Best regards,

Angel Angelov
mobile: +359 88 962 7432
mail: angelov@unitech-bg.com
www.unitech-bg.com
48 "General Yosif V. Gurko" Str.
1000 Sofia Center, Bulgaria

This email was scanned by Bitdefender

ASYC IV

metrix

The expert multimeters for difficult environments

ASYC IV

METRIX® revolutionizes multimeters !

- ▶ **Optimized display:**
 - Graphical display of trends and multiple parameters
 - 600 Hz waveform
- ▶ **Directly-accessible storage** of up to 30,000 measurements
- ▶ **Power supply via USB charger**
- ▶ **Top-of-the-range specifications:** 100 kcts, 200 kHz bandwidth and 0.02% accuracy
- ▶ **Multiple analytical tools:** time/date-stamped MIN/MAX/AVG and PEAK monitoring

... Plus unrivalled simplicity of use, as always!



300 V CAT IV
600 V CAT III

600 V CAT IV
1000 V CAT III

IP
67



3-year
warranty

Measure up



ERGONOMICS AND STRENGTHS

deal for both portable and benchtop use, the ASYC IV multimeters are simple and intuitive to use. Accessible directly, the different measurements are indicated explicitly by pictograms on the electronic switch. The display can be used to view the measurement results either as numeric values or as graphs showing the trend over time. Recorded measurements can be displayed as a trace, with the possibility of positioning cursors and zooming on part of the recorded curve.

Help in French and English is integrated into the instrument and provides information about the measurements in progress. USB or BT communication is provided for data transfers onto PC, recording and programming with the LV/LW drivers. Once it is connected to a PC, it is possible to upgrade the instrument's firmware by using the "Loader" program accessible on our website.



Multiple languages available depending on the release version

SECURE TERMINAL STRIP

Audible alert when the cables are connected to the wrong inputs and automatic recognition of the function - 4 terminals: 3 measurement inputs + 1 isolated connection for USB communication

SELECTION OF THE MEASUREMENT FUNCTION

By means of a function key which then lights up to remind you for intuitive configuration.



DISPLAY WITH LARGE DIGITS

Multiple parameters and 3 levels of backlighting which varies automatically according to the ambient lighting for better visibility and more comfortable reading - graphical: measurement trend, waveform display

F1 → F4 FUNCTION KEYS

For direct access to the function menus.

FOR CHARGING WITH A USB CABLE

IP 67 MOULDED CASING

For excellent handling.

- The ASYC IV models can be powered by normal batteries, rechargeable batteries or the mains supply.
- The battery-powered ASYC IV models, rechargeable via USB, offer a battery life of up to 400 hours to simplify use in the field.
- To optimize the ASYC IV's consumption, the standby mode can be activated and the internal accelerometer allows you to wake up the instrument simply by touching its keyboard.



A magnetic suspension system is available as an option for simple installation and viewing while freeing your hands for other tasks.



Magnetized soft case suitable for the Multifix system.

APPLICATIONS

The ASYC IV multimeters are ideal for many applications in industry, telecommunications and defense. Their multiple functions make them easy to use for electrical and electronics maintenance, as well as machine maintenance. In electronics, the ASYC IV models can be used both for wiring tests on computer or medical equipment and for component testing.

In industry, they can be used for the applications encountered in departments dealing with automatic control systems and processes in a wide variety of sectors: food, plastics, concrete, metal, paper, wood, oil, nuclear, etc.

The ASYC IV models are also useful for the maintenance of many industrial machines: numerical control, motors, generators, etc.

Their versatility makes them ideal for the needs of expert electrical installers and professionals in the transport and energy sectors.

The high-performance, accessible and ergonomic ASYC IV multimeters also have a key role to play in education and research.



For metrology...



Measurements on electrical cabinets



... or After-Sales Service



The IP67 protection of the ASYC IV models means they can handle applications in difficult environments

MEASUREMENTS

Measurements

The TRMS measurements of AC voltages and currents are also accurate on non-linear signals.

AC, DC OR AC+DC VOLTAGE
Voltage measurement can be performed in total safety up to 1,000 V.

CURRENT
AC, DC and AC+DC current measurement with direct readings up to 10 A.

FREQUENCY
The ASYC IV models measure the frequency up to 600 kHz (MTX 3290 and MTX 3291) and up to 5 MHz with the 2 top-of-the-range models, the MTX 3292B and MTX 3293B.

TEMPERATURE
Depending on the models, J/K thermocouples or Pt100 / Pt1000 sensors can be used to measure temperature.

RESISTANCE
Resistance can be measured up to 100 MΩ. A reminder of the connections is constantly displayed at the top of the display.

CAPACITANCE
A broad measurement range is provided for capacitance measurements: from 1 nF to 60 mF depending on the model.

VOLTAGE
The mV/A or A/A ratio can be set on the MTX 3292/3293. Fixed mV/A ratio on the MTX 3290/3291
The ASYC IV multimeters offer direct readings of current measurements with a clamp, which also extends the measurement range up to 100 A.

SETUP
General configuration and customization of the measurement functions. Password protection of .cfg file

Continuity with audible beep

File management

Recording

Depending on the models, the ASYC IV instruments can record up to 30,000 values. The simplified parameterization concerns the number of measurements, the interval (0.3 s to 24 hours), the duration and the storage capacity.

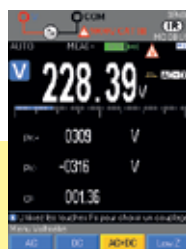
File management

Display of the files with time/date-stamping and campaign name.

FUNCTIONS

CONTROL OF MEASUREMENT WITH THE SURV AND PEAK FUNCTIONS

The capture of time/date-stamped minimum / maximum / average and PEAK values makes it possible to record the transient values and variations automatically. This function enables effective detection of a signal's variations or anomalies.



RECORDING OF 30,000 VALUES IN THE MULTIMETER'S MEMORY

Main value + secondary values with graphical trace. 30 campaigns with a minimum interval of 0.3 s.



RELATIVE VALUES FOR GREATER PRECISION

The REL relative mode can be used to express measurements as absolute and relative differences with regard to the reference measured.



DISPLAY OF THE WAVEFORM

V or I signal display up to 600 Hz, auto trigger.



MEASUREMENT WITH CURRENT CLAMP

Depending on the model, users can integrate the transformation ratio for direct readings of the current value, whether the clamp is equipped with a V or A output.

MATH FUNCTION

This function is adapted for the measurement of any physical quantity by appropriate unit conversion and offers direct readings (Ax+B).



Hz FUNCTIONS

Frequency can be measured up to 5 MHz. This function can be used in addition to +/- duty cycle measurement to analyse the active or inactive intervals of switching signals or logic signals. PW+/- pulse width measurement allows you to check electronic fuel injection systems and switching power supplies.

ACCURATE MEASUREMENTS, INCLUDING ON VARIABLE SPEED DRIVES

A 300 Hz low-pass filter ensures accurate voltage and frequency measurements on the drive units of PWM variable-speed motors.

FLEXIBILITY

The RANGE function allows you to select the most suitable measurement range for the measurements in progress, either automatically or manually.

USER-FRIENDLY AND TIME-SAVING

The "user/basic" function saves the preferred settings when the instrument is powered down, on the basis of the user's preferences, so it is no longer necessary to repeat the settings!

Communication

- The ASYC IV models are equipped with a universal communication mode based on the SCPI standard, via USB or Bluetooth. The SX-DMM software provides a simple and effective way of viewing, processing and analysing the data. SX-DMM is delivered as standard and upgrades are available for download free of charge from our support website. The SX-DMM software allows real-time processing of the data on a PC, as well as instrument upgrades.
- In addition, the ANDROID application can be used to monitor measurement campaigns and view them remotely.



MTX 3290 & MTX 3291

These portable multimeters with **digital display** allowing direct measurement of the main electrical quantities benefit from an innovative design making them compact, rugged, watertight and comfortable to grip.

You can use these training multimeters in total safety in electrical engineering and electronics. The design of these 2 easy-to-use models is based on the principle of "1 key, 1 function". The dynamic recording functions (time/date-stamped Min, Max and AVG) are just as simple. Monitoring of voltage and current peaks enables you to capture all the faults very easily.

Simple multimeters

- Easy-to-read 70 x 52 mm LCD screen
- Contextual reminder of connection on the screen
- Current autoranging, single terminal up to 10 A
- Secondary measurements in addition to the main measurement to facilitate analysis
- Surveillance of the MIN/MAX and AVG data with relative time/date-stamping and of voltage and current peaks
- SX-DMM software for real-time processing of the data on a PC (MTX 3291)

And much more...

- IP67 protection against water projection and dust ideal for outdoor conditions
- Powered by 4 standard AA batteries or 4 Ni-MH batteries rechargeable with an HX0051B external module (option)
- Operation for up to 400 hrs on batteries



MTX 3290



MTX 3291

Type	Digital display	
Models	MTX 3290	MTX 3291
Display	digital monochrome 70 x 52 mm	backlit digital monochrome 70 x 52 mm
No. of counts	6,000 cts	60,000 cts
Power supply	4 x R6 batteries or 4 rechargeable batteries (external charger)	
Communication	-	IR/USB

	MTX 3290
Display resolution (counts)	6 k
VAC/DC/AC+DC	•
VLowZ	•
IAC / I DC	•
IAC+DC	•
IAC/DC direct reading	•
Resistance	•
Capacitance	•
Frequency meter	•
Audible continuity / Diode test	• / •
Temperature with K TC / Pt100	- / •
dBm (/R) / dB (/Vref)	- / -
Resistive power	-
Duty cycle / Pulse width / Pulse counting	- / - / -
HOLD / Auto- HOLD	• / •
Min / Max / Avg	• / • / •
Peak+ / Peak- / CF	• / • / -
Relative measurements	
MATH function	-
Recording	-
USB communication / Bluetooth	-
CAT III / CAT IV	600 V / -
3-year warranty	•

MTX 3292B & MTX 3293B

These portable multimeters with **graphical colour display** allow direct measurement of the main electrical quantities and show the trends instantaneously. They benefit from an innovative design making them compact, rugged, leakproof and comfortable to grip. Their strengths lie in the product HMI, the advanced measurement functions and the help provided when measuring.

High-performance graphical multimeters...

- Easy-to-read 320 x 240-pixel colour matrix screen with black background
- Graphical display of the trends on a summary screen
- Trace, cursors and zoom on recordings
- Recording of up to 30 sequences

Dynamic loggers

- Up to 30,000 measurements stored in memory
- Simplified setting of the number of measurements, interval, duration and storage capacity
- Internal storage of measurement 10 sequences
- Interactive zoom function + cursors on the recordings
- A simple surveillance mode displaying the time/date-stamped MIN/MAX and AVG values

... And much more!

- Contextual reminder of the connections
- Normal USB communication or Bluetooth available as an option
- IP67 protection against water projections and dust, ideal for outdoor conditions
- Ni-MH AA rechargeable battery, the best solution in terms of quality and price
- Operation for up to 100 hrs on batteries with management of the battery charge level
- No time-wasting: the instrument operates while charging

MTX 3291	MTX 3292B	MTX 3293B
60 k	100 k	100 k
•	•	•
•	•	•
•	•	•
•	•	•
•	•	•
•	•	•
•	•	•
• / •	• / •	• / •
- / •	• / •	• / •
• / -	• / •	• / •
•	•	•
• / • / -	• / • / •	• / • / •
• / •	• / •	• / •
• / • / •	• / • / •	• / • / •
• / • / -	• / • / •	• / • / •
•	•	•
-	•	•
-	10.000	30.000
•	• / • (option)	• / • (option)
1,000 V / 600 V	1,000 V / 600 V	1,000 V / 600 V
•	•	•

Type	Graphical	
Models	MTX 3292B	MTX 3293B
Display	Graphical colour (70 x 52 mm)	
Keypad	7 function keys + setup	
Power supply	4 x R6 batteries or 4 rechargeable batteries (internal charger)	
Communication	IR/USB	(Bluetooth as an option)
Storage	10,000 measurements	30,000 measurements



	MTX 3290	MTX 3291 *	MTX 3292B	MTX 3293B
DC, AC and AC+DC voltages	60 mV to 600 V	60 mV to 1,000 V	100 mV to 1,000 V	
DC accuracy	0.3 %	0.05 %	0.03 %	0.02 %
AC and AC+DC bandwidth	20 kHz	100 kHz	100 kHz	200 kHz
DC, AC and AC+DC current	600 µA to 10 A / 20 A [30 s max])*		1000 µA to 10 A / 20 A [30 s max]	
DC accuracy	0.08 %		0.08 %	
Frequency	60 Hz to 600 kHz		10 Hz to 5 MHz	
Resistance	600 Ω to 60 MΩ		100 Ω to 100 MΩ	
Audible continuity	600 Ω SIGNAL < 30 Ω ±5 Ω < 5 V		1000 Ω SIGNAL < 20 Ω < 3,5 V	
Diode test	3 V with 1 mV resolution		Diode 0 -2.6 V < 1 mA + Zener Diode or LED 0-20 V < 11 mA	
Capacitance	6 nF to 60 mF		1 nF to 10 mF	
Temperature PT100/1000	-200 °C to 800 °C			
Temperature TK/TJ	-		-40 to +1,200 °C	

OTHER FUNCTIONS

Surveillance	Time/date-stamped MAX/MIN /AVG or PEAK ±, on all the main positions	SURV time/date-stamped MAX/MIN /AVG or PEAK ±, on all the main positions + waveform	
REL	REL relative value + measured reference value on secondary display*	Display of measured value and, on 3 secondary levels, the REF value, the difference expressed in the measurement unit and the difference in %	
PWM filter	4th-order 300 Hz low-pass filter for measuring on variable speed drives of asynchronous motors		
V-output clamp function for direct reading	Integration of the ratio: 1/1 ,1/10,1/100,1/1000 mV/A	Parameterizable Ax ratio	
Secondary functions or measurements	dBm and VA resistive power, +/- duty cycle, and pulse width*	3 measurements + main measurement	
SPEC	-	Display of measurement tolerance: Smin, Smax	
GRAPH	-	Main measurement trend on adjustable time base + Cursor with waveform up to 600 Hz	
Central zero	Selectable or automatic* bargraph for VDC and IDC	Automatic trend bargraph	
Measurement storage	-	10,000	30,000

GENERAL SPECIFICATIONS

Type of display	LCD with backlighting* and digits 14 mm high – Double 60,000* or 6,000-count display		Colour graphical display (70 x 52) with backlighting on 4 100,000-count displays
PC interfaces	-	USB optical connector & SX-DMM software	USB optical connector or Bluetooth (option)– SX-DMM software - ANDROID application
Power supply	4 x AA batteries or Ni-MH batteries		Charger or 4 x AA batteries or Ni-MH batteries
Safety / EMC	Safety as per IEC 61010-1 1,000 V-CAT III/600 V CAT IV* or 600 V CAT III /300 V CAT IV - Safety as per IEC 61010-2-033		Safety as per IEC 61010-1 1,000 V-CAT III /600 V CAT IV Safety as per IEC 61010-2-033
Environment	Storage -20 °C to +70 °C – Operation -10 °C to +55 °C		Storage: -20 °C to +70 °C – Operation: 0 °C to +40 °C
Mechanical specifications	Dimensions (L x P x H): 196 x 90 x 47.1 mm – Weight: 570 g		
Warranty	3 years		

STATE AT DELIVERY

- MTX 3290 delivered with 4 x 1.5 V alkaline batteries, 1 red straight/straight lead 1.5 m long, 1 black straight/straight lead 1.5 m long, 1 red CAT IV 1 kV test probe, 1 black CAT IV 1 kV test probe, 1 user's manual on CD and 1 start-up guide on paper.
- MTX 3291 delivered with 4 x 1.5 V alkaline batteries, 1 red straight/straight lead 1.5 m long, 1 black straight/straight lead 1.5 m long, 1 red CAT IV 1 kV test probe, 1 black CAT IV 1 kV test probe, 1 user's manual on CD and 1 start-up guide on paper plus 1 bag, 1 USB cable with SCPI remote programming manual and SX-DMM software.
- MTX 3292 and MTX 3293 delivered with 1 bag, 4 Ni-MH 2,400 mAh 1.5 V rechargeable batteries, 1 charger, 1 red straight/straight lead 1.5 m long, 1 black straight/straight lead 1.5 m long, 1 red CAT IV 1 kV test probe, 1 black CAT IV 1 kV test probe, 1 optical USB cable + SX-DMM software, 1 user's manual on CD and 1 SCPI remote programming manual and 1 start-up guide on paper.

REFERENCES

1 MTX 3290 multimeter	MTX3290
1 MTX 3291 multimeter	MTX3291
1 MTX 3292B multimeter	MTX3292B
1 MTX 3293B multimeter	MTX3293B
1 MTX 3292B multimeter - Bluetooth version ...	MTX3292B-BT
1 MTX 3293B multimeter - Bluetooth version ...	MTX3293B-BT

OPTIONS

MTX329XB graphical colour calibration software	HX0059B
MTX digital DMM transport kit.....	HX0052B
Graphical colour DMM transport kit.....	HX0052C
MTX 3290 / 3291 calibration software	P01196770
Kit of 4 external Ni-MH rechargeable batteries.....	HX0051B
MTX 328X and MTX 329X external battery charger (4 batteries incl.)..	HX0053B
USB Bluetooth modem.....	P01102112



Sefram

SEFRAM 7335

6000 counts - TRMS AC+DC Multimeter

**Make sure to visit
our Website**
<http://www.sefram.fr>

**Robust, reliable and high performance
multimeter**

Capabilities :

- Basic accuracy of 0.08% in V DC
- Voltage measurement up to 1000V AC, DC and TRMS AC+DC
- Current measurement from 60mA to 10A for AC, DC and TRMS AC+DC
- Resistance measurement up to 40Mohms
- Capacitance measurement up to 10mF
- Frequency counter up to 100kHz
- Continuity test with buzzer
- Temperature measurement (for K thermocouple)
- Autoranging
- Diode test
- Panoramic LCD with backlight and 65 segments bargraph
- Functions: Hold, Peak-Hold (1ms), Min-Max
- Safety : CAT IV - 600V and CAT III - 1000V

TRMS AC+DC



Specifications

DC voltages	
Ranges	60mV to 600V (in 6 ranges)
Basic accuracy	$\pm(0.08\% + 2\text{dgt})$
Resolution	10 μ V to 1V
AC voltages	
Ranges	60mV to 1000V (in 6 ranges)
Basic AC accuracy	$\pm(0.8\% + 5\text{dgt})$
Basic TRMS AC+DC accuracy	$\pm(2\% + 5\text{dgt})$
Resolution	10 μ V to 1V
Bandwidth	50Hz to 1000Hz
AC and DC voltages, Lo impedance mode	
Ranges	600V and 1000V
Basic AC accuracy	$\pm(0.8\% + 3\text{dgt})$
Input impedance	3 kohms
DC currents	
Ranges	60mA, 600mA, 6A and 10A
Basic accuracy	$\pm(0.8\% + 3\text{dgt})$
Resolution	10 μ A to 10mA
Protection	HBC fuse 440mA /1000V - 10kA HBC fuse 11A / 1000V - 20kA
AC currents	
Ranges	60mA, 600mA, 6A and 10A
Basic AC accuracy	$\pm(1.2\% + 3\text{dgt})$
Basic TRMS AC+DC accuracy	$\pm(2\% + 5\text{dgt})$
Resolution	10 μ A to 10mA
Protection	HBC fuse 440mA /1000V - 10kA HBC fuse 11A / 1000V - 20kA
Resistance	
Ranges	600 ohms to 40Mohms (in 6 ranges)
Basic accuracy	$\pm(0.8\% + 2\text{dgt})$
Open circuit voltage	2.5V max
Continuity test	yes, with buzzer
Diode test	yes, under 0.4mA typical

Sefram 7335

Capacimeter	
Ranges	1 μ F to 10mF in 5 ranges
Basic accuracy	$\pm(1.2\% + 2\text{dgt})$
Temps de mesure	from 0.7s to 3 s (according to range)
Resolution	1nF to 10 μ F
Frequency (on AC current and voltage ranges)	
Ranges	100Hz to 100kHz in 4 ranges
Accuracy de base	$\pm(0.1\% + 2\text{dgt})$
Temperature (K type thermocouple)	
Ranges	-40°C to +400°C
Accuracy	$\pm(1\% + 10\text{dgt})$, excluding the thermocouple accuracy
Resolution	0.1°
Peak-Hold (1ms)	
Accuracy	Add 150 digits to the accuracy of the selected range/function
Functions	
	Hold, Min-Max
General specifications	
Display	LCD, backlighted
Display counts	3 digits 3/4, 6000 counts with 65 segments bargraph
Measurement rate	3 meas./s
Operating temperature	-10°C to 50°C (RH<70%)
Storage temperature	-20°C to 60°C (without battery and RH<80%)
Protection	electronic and HBC fuses for current ranges
Safety	600V - CAT IV and 1000V CAT III
Power supply	1 single 9V - 6F22
Autonomy	150h typical (with alkaline battery and backlight off)
Auto power-off	after 20mn
Dimensions	190 x 94 x 48mm
Weight	460g

Supplied with : a test lead set, battery (installed) and manual.

FT 7335A00 - Specifications can be updated without notice



Sefram

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Tél. +33 (0) 4.77.59.01.01 / Fax. +33 (0) 4.77.57.23.23
Web : www.sefram.com - e-mail : sales@sefram.com



For assistance and ordering

CA 5292 & CA 5293

RECORDER-MULTIMETERS WITH GRAPHICAL COLOUR SCREEN



ASYC IV, the reference for multimeters in the lab and in the field!

- ▶ **Optimized display:**
 - Graphical display of trends and multiple parameters
 - 600 Hz waveform
- ▶ **Storage of up to 30,000 measurements with direct access [Mem]**
- ▶ **Power supply via USB charger**
- ▶ **Top-of-the-range specifications:** 100 kcts, 200 kHz bandwidth and 0.02% accuracy
- ▶ **Multiple analytical tools:** time/date-stamped monitoring of Min/Max/Avg and Peak, filtering, duty cycle

... While continuing to offer unrivalled simplicity of use!



600 V CAT IV
1000 V CAT III

IP
67



**3-year
warranty**

Measure up



ERGONOMICS AND ADVANTAGES

Simultaneously portable and benchtop multimeters, the ASYC IV models are simple and intuitive to use. Accessible directly, the various measurements are represented explicitly in the form of pictograms on the electronic switch.

The display allows users to view the measurement results either as numeric values or as graphs showing the trend over time. Recorded measurements can be displayed as traces, with the possibility of positioning cursors and zooming on a part of the recorded curve.

An integrated help function available in French and English provides information on the measurements in progress. USB or BT communication is provided to transfer the data onto a PC for saving and programming with the LV/LW drivers. Once the instrument is connected to the PC, the firmware can be updated by accessing the "Loader" program on the web.

PROTECTED TERMINAL STRIP

The terminal strip for the measurements is located at the top of the instrument to ensure that the screen remains as easy to read as possible. If the cables are connected to the wrong inputs, there is an audible alert signal and the function is recognized automatically.

- 4 terminals: 3 measurement inputs
- + 1 isolated connection for USB communication



DISPLAY WITH LARGE DIGITS

Multiple parameters with 3 levels of backlighting which vary automatically according to the lighting conditions for better visibility and more comfortable reading.



GRAPHICAL SCREEN

Monitoring of the evolution of the main quantity or display of the waveform

F1 - F4 FUNCTION KEYS

For direct access to the function menus

SELECTION OF THE MEASUREMENT FUNCTION

By means of a function key which is lit to remind you of the function selected for intuitive configuration



Specific connector to USB for charging

IP 67 MOULDED CASING

For instrument safety and comfortable handling

APPLICATIONS

A SYNC IV multimeters are ideal for many applications in the industrial sector, telecommunications and Defence. Their multiple functions make them easy to use for electrical, electronics and machine maintenance. In the electronics sector, the ASYC IV models can be used to test wiring, IT or medical equipment and SMDs. With their IP67 protection, they are designed to be dustproof and watertight for difficult environments. In industry, they are ideal for applications involving automation and processes in a wide variety of sectors: agri-food, plastics, concrete, metal, paper, wood, oil, nuclear. ASYC IV multimeters can be used for the maintenance of many industrial machines: numerical control systems, motors, generators, etc. These versatile instruments are also suitable for the needs of expert electrical installers and professionals in the transport and energy sectors.

The high-performance, affordable and ergonomic ASYC IV models also have their place in education and research.



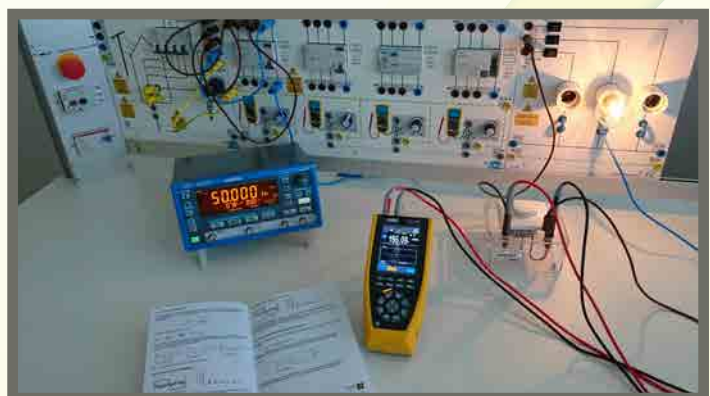
Temperature measurement on solar panels. The practical magnetized Multifix accessory allows you to work hands-free.



Measurements on heating and air-conditioning systems: current, voltage and temperature.



Measurement with leakage current clamp and recording of the fault.



High-performance functions for R&D and laboratory testing.

MEASUREMENTS

The TRMS AC voltage and current measurements are also accurate on non-linear signals.

The status of the terminal strips is constantly shown at the top of the display as a reminder.

AC, DC OR AC+DC VOLTAGE

Voltages can be measured up to 1,000 V in total safety.

CURRENT

Direct AC, DC and AC+DC measurements up to 10 A permanent.

FREQUENCY

The ASYC IV models measure frequency up to 5 MHz, as well as the duty cycle and power.

TEMPERATURE

Temperatures can be measured using a J/K thermocouple or Pt100/Pt1000 probe, depending on the model.

RESISTANCE

Resistance can be measured up to 100 MΩ.

CAPACITANCE

The range for capacitance measurements is quite wide: 1 nF to 60 mF depending on the model.

CURRENT

ASYC IV multimeters allow direct reading of current measurements with a clamp, thus extending the measurement range.

SETUP

General configuration and customization of the measurement functions. Possibility of protection with a password.

Parameterizable mV/A or A/A ratio on the CA 5292/3293

Recording

Depending on the model, ASYC IV multimeters can record up to 30,000 values. The simplified parameterization concerns the number of measurements, the recording interval (0.2 s to 24 h), the duration and the storage capacity.

File management

Display of the files with time/date stamp and campaign name.

FUNCTIONS

Display of the trends of each main quantity with time base parameterizable from 1min28s to 1h13min20s.

CONTROL OF THE MEASUREMENT BY MEANS OF SURV AND PEAK FUNCTIONS

Time/date-stamped capture of the minimum / maximum/ average and PEAK values enables you to record the transient values and variations automatically. This function can be used for effective detection of a signal's variations or anomalies.



STORAGE OF 30,000 RECORDED VALUES IN THE MULTIMETER'S MEMORY

Main and secondary values with graphical trace.



RELATIVE VALUES FOR GREATER ACCURACY

The REL relative mode can be used to express the measurements in terms of their absolute and relative deviation from the reference measured.



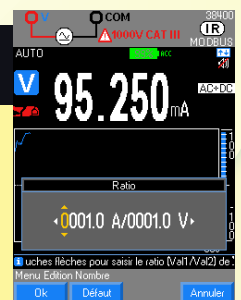
WAVEFORM DISPLAY

Display of a V or I signal up to 600 Hz, with automatic trigger. Practical when you want to find out the shape and evolution of a signal.



MEASUREMENT WITH CURRENT CLAMP

Depending on the model, users can integrate the transformation ratio to allow direct reading of the current value, whether the clamp is equipped with a V output or an A output.



MATH FUNCTION

This function is suitable for measuring any physical quantity by conversion into the appropriate unit and offers direct readings (Ax + B).



ACCURATE MEASUREMENTS, INCLUDING ON VARIABLE SPEED DRIVES

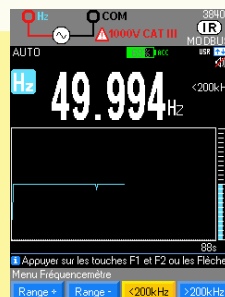
A 300 Hz low-pass filter guarantees accurate voltage and frequency measurements on PWM variable speed drives.

FLEXIBILITY

The RANGE function automatically selects the most suitable measurement range for the measurements in progress.

Hz FUNCTION

Frequency can be measured up to 5 MHz. This function can also be used to measure the +/- duty cycle for analysis of the active or inactive intervals of switching signals or logic signals. PW+/- pulse width measurement can be used to check electronic fuel injection systems and switching power supplies.



USER-FRIENDLY & TIME-SAVING

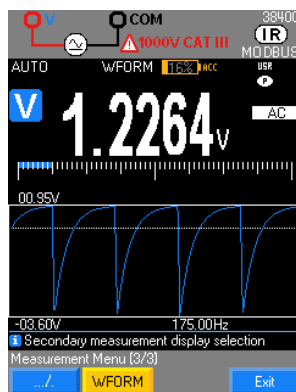
The "user/basic" function saves the setting preferences defined by the user when the instrument is powered down. This means you don't have to readjust the settings every time you switch on! This function is password-protected.

CA 5292 & CA 5293

These portable multimeters with graphical colour display allow direct measurement of the main electrical quantities and instantaneous display of the trends. With their innovative design, they are compact, rugged, watertight and easy to grip. Other advantages include the product HMI, the advanced measurement functions and the measurement help function.

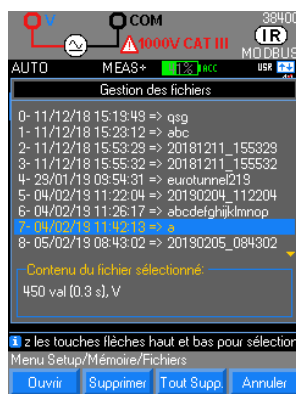
High-performance graphical multimeters...

- Easy-to-read 320 x 240-pixel colour matrix screen with black background
- Graphical display of the trends in a summary screen
- Trace, cursors and zoom on the recordings
- Recording of up to 30 sequences
- Automatic waveform display



Dynamic recorders...

- Storage of up to 30,000 measurements in memory. Simplified parameterization of the number of measurements, the interval, the duration and the storage capacity...
- Internal storage of 30 measurement sequences
- File manager: with date, time and name.
- Interactive zoom function and cursors on the recordings
- A simple monitoring mode displaying the time/date-stamped MIN/MAX and AVG values



...And more

- Contextual reminder of the connections
- Standard USB communication plus Bluetooth option
- IP67 ingress protection resistant to water projection and dust, suitable for outdoor use
- Commercially-available NiMH AA rechargeable battery, the best price-quality solution
- Battery life of up to 100 hours with management of the battery level
- No time wasted: the instrument operates while charging at the same time



	CA 5292	CA 5293
Display resolution (counts)	100 k	100 k
VAC/DC/AC+DC (BW)	100 kHz	200 kHz
VLowZ	•	•
IAC / I DC	•	•
IAC+DC	•	•
IAC/DC direct reading	•	•
Resistance	•	•
Capacitance	•	•
Frequency meter	•	•
Audible continuity / Diode test	•/•	•/•
K TC / Pt100 temperature	•/•	•/•
dBm (Z/R) / dB (Z/Vref)	•/•	•/•
Resistive power	•	•
Duty cycle / Pulse width / Pulse counting	•/•/•	•/•/•
HOLD / Auto- HOLD	•/•	•/•
Min / Max / Avg	•/•/•	•/•/•
Peak+ / Peak- / CF	•/•/•	•/•/•
Relative measurements	•	•
MATH function	•	•
Recording	10,000	30,000
USB / Bluetooth communication	•/• (option)	•/• (option)
CAT III / CAT IV	1,000 V / 600 V	1,000 V / 600 V
3-year warranty	•	•

Documents available

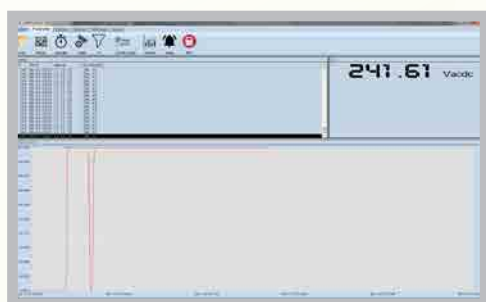
- Start-up guide in 20 languages
- User's manual in more than 11 languages
- SCPI programming guide in 2 languages
- and, as always, the HMI in 5 languages!

CA 5292 & CA 5293

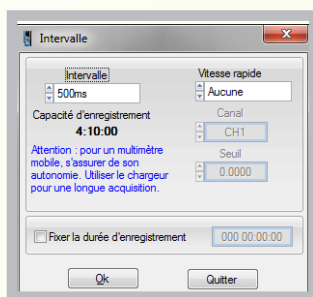
Communication



- The ASYC IV models are equipped with a universal communication mode, based on the SCPI standard, via USB or Bluetooth. The SX-DMM software is a simple, effective tool for display, processing and analysis of the data. SX-DMM is delivered as standard with the product and updates are available to download free of charge from the Support website. The SX-DMM software can be used for real-time processing of the data on a PC, upgrading of the instrument and calibration, as well as offering a new function for automatic adjustment of the time on the instrument. It is also possible to display the storage capacity.
- The ANDROID application, available for download from the Google store, can be used to monitor measurement campaigns and view the measurements remotely.



Display of the data and the curve with the spreadsheet export function.



Parameterization of the recording campaigns



Mathematical functions applied to the data

The loader! Choose your working language from the 5 languages available.

4 language packs available as firmware upgrades.



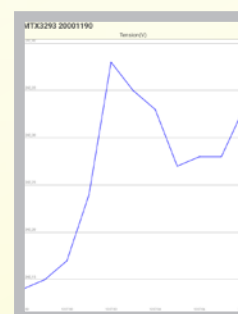
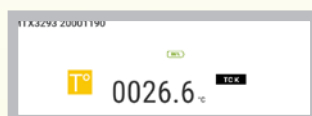
Translation of the messages

Translation of the interactive menus

ANDROID application available on Google Play.



Main function in real time + data recording and use of tools such as email, SMS, etc



Curve plotted on a tablet

	CA 5292	CA 5293
DC, AC and AC+DC voltages	TRMS	
Range	100 mV * / 1000 mV / 10 V / 100 V / 1000 V	
Resolution	1 µV / 10 µV / 0.1 mV / 1 mV / 10 mV	
AC and AC+DC bandwidth	100 kHz	200 kHz
DC accuracy	0.03%	0.02%
AC and AC+DC (VLowZ) accuracy	0.3%	0.3%
DC, AC and AC + DC TRMS current		
Range	1000 µA / 10 mA / 100 mA / 1000 mA / 10 A / 20 A (30s max on 100 A range)	
Resolution	10 nA / 0.1 µA / 1 µA / 10 µA / 100 µA / 1000 µA	
DC / AC and AC+DC accuracy	0.08% / 0.3%	
AC and AC+DC bandwidth	50 kHz	
Frequency		
Frequency range	10 Hz / 100 Hz / 1 kHz / 10 kHz / 100 kHz / 1 MHz / 5 MHz	
Resolution	0.0001 Hz / 0.001 Hz / 0.01 Hz / 0.1 Hz / 1 Hz / 10 Hz / 100 Hz	
Resistance and continuity		
Ranges	100 Ω * / 1 kΩ / 100 kΩ / 1000 kΩ / 10 MΩ / 100 MΩ	
Resolution	0.001 Ω / 10 mΩ / 100 kΩ / 10Ω / 10Ω / 1 kΩ	
Basic accuracy	0.07%	
Protection	1000 V electronic protection	
Audible continuity detection	1000 Ω / SIGNAL <20 Ω < 3.5 V	
Diode test		
Threshold voltage measurement	Diode 0 -2.6 V <1 mA + Zener diode or LED 0-2.6 V <11 mA	
Capacitance		
Ranges	1 nF / 10 nF / 100 nF / 1000 nF / 10 µF / 100 µF / 1 mF / 10 mF	
Resolution *	1 pF / 10 pF / 0.1 nF / 1 nF / 0.01 µF / 0.1 µF / 1 µF / 10 µF	
Temperature with Pt100/1000 and K/J thermocouples		
Operating range	-200 °C to +800° C with Pt and -40 to +1200 °C with K thermocouple	
Accuracy	0.1 %	
Other Measurement functions		
SURV MAX/MIN/AVG	Time/date-stamped on all the main positions	
REL	Reference-delta relative value on 3 displays + main measurement	
PWM filter	4th order 300 Hz low-pass filter for measurements on variable speed drives of asynchronous motors	
SPEC	Display of the measurement tolerance + Smin + Smax	
GRAPH	Trends of main measurements with max., variable time and display of waveform (50/60 and 600 Hz)	
Secondary measurements	3 measurements + main measurement	
Measurement storage	10,000	30,000

*manual access

General specifications	
Type of display	Colour graphical (70x52) with backlighting and black background on 4 x 100,000-count displays
PC interfaces	Optical USB connector or Bluetooth (option) – SX-DMM software and ANDROID application
Power supply	USB-type charger or 4 AA batteries or NiMH rechargeable batteries
Safety / EMC	Safety as per IEC 61010-1, IEC 61010-2-033 1000 V-CAT III / 600 V-CAT IV EMC as per EN 61326-1
Environment	Storage: -20 °C to +70 °C – Operation: 0 °C to +40 °C
Mechanical specifications	Dimensions (L x W x H): 196x90x47.1 mm – Weight: 570 g
Warranty	3 years

STATE AT DELIVERY

4 x 1.5 V NiMH rechargeable batteries
1.5 m straight/straight red cable
1.5 m straight/straight black cable
Red CAT IV 1 kV test probe
Black CAT IV 1 kV test probe
USB optical communication cable + SX-DMM software
USB charger + USB connection cable
User's Manual on CD and multilingual start-up guide on paper

REFERENCES

CA 5292.....PO1196802
CA 5293.....PO1196803
CA 5292BT.....PO1196812
CA 5293BT.....PO1196813

OPTIONS

Calibration software.....PO1196770
Kit of 4 NiMH batteries.....HX00518



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Fax : +33 1 46 27 73 89
info@chauvin-arnoux.fr
www.chauvin-arnoux.fr

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Fax: +44 1924 455 328
info@chauvin-arnoux.co.uk
www.chauvin-arnoux.com

MIDDLE EAST
Chauvin Arnoux Middle East
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1241 2020 JAL EL DIB - LEBANON
Tel: +961 1 890 425
Fax: +961 1 890 424
camie@chauvin-arnoux.com
www.chauvin-arnoux.com

Изх. № BGR 1014 / 07.10.2022 г.

До: "АЕЦ Козлодуй" ЕАД
Управление "Търговско"
Отдел "Маркетинг и доставки"
На вниманието на: Христо Пачев - Гл. експерт маркетинг
тел.: + 359 973 7 6140
е-mail: HPatchev@npp.bg
commercial@npp.bg

Относно: Пазарна консултация № 5039 -
„Доставка на измервателни прибори“
Обособена позиция № 3 –
„Калибратори“

Уважаеми г-н Пачев,

Във връзка с Покана за пазарна консултация № 5039 - „Доставка на измервателни прибори“ и Обособена позиция № 3 – „Калибратори“ имаме удоволствието да представим нашето

ИНДИКАТИВНО ПРЕДЛОЖЕНИЕ

№	ID	Наименование	Мярка	К-во	Единична Цена в лв. (без ДДС)	Стойност, лв. (без ДДС)
1.	126546	AOIP Calys150	бр.	2	11685	23370
2.	126548	Metrix CX1652	бр.	1	68645	68645
3.	138343	DIGISTANT® MODEL 4463	бр.	2	20450	40900
Общо:						132915

ТЪРГОВСКИ УСЛОВИЯ

Цените са в лева, без ДДС, DDP Козлодуй.

Срок на доставка: 90 календарни дни от датата на заявката.

Гаранционен срок: AOIP Calys150 - 12 месеца/ Metrix CX1652 - 24 месеца/
DIGISTANT® MODEL 4463 - 24 месеца.

Плащане: По банков път, до 30 календарни дни от датата на приемане на доставката на основание на данъчна фактура.

Придружаваща документация: Приемо-предавателен протокол; Гаранционна карта, Ръководство за експлоатация.

Адрес за кореспонденция:

УНИТЕХ КОНТРОЛ ЕООД, 1000 гр. София, ул. "Ген. Йосиф В. Гурко" № 48.

Банкови реквизити: Разплащателна сметка: BG 94 UNCR 7630 1077 5989 99.

BIC код Уникредит Булбанк АД: UNCRBGSF

ИН по ЗДДС – BG831758563; ИН по ДОПК – 831758563.

За контакти: Георги Милушев, моб. 088 850 1235; тел./факс: 02 821 04 05,
е-mail: office@unitech-bg.com.

Валидност на офертата: 1 месец от датата на получаването.

Приложение: Техническа спецификация.

В очакване на Вашия отговор,

УНИТЕХ КОНТРОЛ ЕООД

Заличено на основание ЗЗЛД

Изготвил: инж. А. Ангелов

Управител:

/доц. д-р инж. Г. Милушев/

ТЕХНИЧЕСКА СПЕЦИФИКАЦИЯ
За „Доставка на измервателни прибори“
Обособена позиция № 3 – „Калибратори“

ID	ID производи тел	Описание на артикула
126546	AOIP Calys150	Калибратор преносим: задаване на постоянно напрежение с точност за една година: 0.005% от отчетената стойност + 2μV за обхват до 100mV, постоянен ток с точност 0.007% от отчетената стойност + 0.8μA за обхват до 24mA, ел. съпротивление с точност 0.006% от отчетената стойност + 20 mΩ за обхват 400Ω; измерване на постоянно напрежение с точност 0.005% от отчетената стойност + 2μV за обхват до 100mV, постоянен ток с точност 0.007% от отчетената стойност + 0.8μA за обхват до 24mA, ел. съпротивление с точност 0.006% от отчетената стойност + 8 mΩ за обхват 400Ω, температура Pt100 и термодвойки тип E, N, R, S, K, T, J, B, U, L, C, G, D.
126548	Metrix CX1652	Калибратор на електрически сигнали, технически характеристики: постоянно напрежение от 0V до ±1000V с грешка 0,0015%; променливо напрежение от 0V до ±1000V (20Hz-10kHz) с грешка 0,1%, постоянен ток: от 1μA до ±30A с грешка 0,05%, променлив ток: от 1μA до 30A (20Hz-1kHz) с грешка 0,15%; съпротивление: от 0Ω до 1000MΩ с грешка 0,01%; синусоиден сигнал с честота до 20MHz и точност 0,1%, токова бобина за разширяване на обхвата по ток (x10/x50).
138343	DIGISTANT® MODEL 4463	DC напрежение ±100 nV ... ±100 V (точност от 0.002 %); DC ток ±100 nA ... ±50 mA (точност 0.005 % ±1 μA); 12 типа термодвойки (точност от 0.1 K); RTD симулация Pt100 ... Pt1000, Ni100 ... Ni1000; LabView драйвер за софтуерно интегриране.

MANUFACTURER'S AUTHORIZATION LETTER

Date: 02/04/2021

To: UniTech Control Ltd

WHEREAS **CHAUVIN ARNOUX GROUP** who are established and reputable manufacturers of portable measuring instruments having headquarter at CHAUVIN ARNOUX 12-16 Rue Sarah Bernhardt, 92600 Asnières-sur-Seine, France do hereby authorize:

The Bidder: NPP Kozloduy

Address: 3321 Kozloduy Bulgary

Tel : +359 973 7 20 20

Fax: + 359 973 7 60 73

to purchase, to resell and to supply portable measuring instruments manufactured by our company.

Best regards,

Заличено на основание 33ЛД

M. Philippe CONTANT

Export Manager

Test and Measurement

CHAUVIN ARNOUX

p.o: Mr. Contant.





AOIP SAS
ZAC de l'Orme Pomponne
50-52 avenue Paul Langevin
91133 Ris-Orangis
France

Manufacturer's Authorization

To whom it may concern:

Ris-Orangis, France, 23rd September 2021

We, the undersigned, **AOIP – ZAC de l'Orme Pomponne – 50-52 avenue Paul Langevin – 91133 Ris-Orangis – France**, manufacturer of high precision instruments, certifies hereby that the company:

UniTech Control Ltd.
48 Gurko Str., 1000 Sofia,
Bulgaria
Tel: + 359 2 8210405

is entitled to act as an authorized agent and thereby to negotiate sell and market our products and services in the Republic of Bulgaria.

This authorization is valid till December 31st 2022.

Duly authorized to sign for and behalf of:

AOIP SAS

Заличено на основание 33ЛД

50 52

Yin Ping LIU
Export Area Sales Manager

Пачев, Христо Б.

From: Богоева, Юлия К.
Sent: 10 октомври 2022 г. 8:32
To: Пачев, Христо Б.
Сс: Александров, Пламен Г.; Лазарова, Милена Т.
Subject: FW: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 3 – „Калибратори”
Attachments: 20221007 Offer Calibrators.pdf; AOIP-CALYS_150.pdf; CX 1652.pdf; DIGISTANT MODEL 4463_EN.pdf; AOIP_Letter of Authorization.pdf; Chauvin Arnoux_AUTHORIZATION UNITECH CONTROL-NPP.pdf

BX-E-5617/10.10.2022

-----Original Message-----

From: office@unitech-bg.com <office@unitech-bg.com>
Sent: Friday, October 7, 2022 7:16 PM
To: commercial <commercial@npp.bg>
Сс: Пачев, Христо Б. <HPatchev@npp.bg>; Office <office@unitech-bg.com>
Subject: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 3 – „Калибратори”

Уважаеми Колеги,

Във връзка с Пазарна консултация №5039 - „Доставка на измервателни прибори” приложено изпращам:

1. Оферта по Обособена позиция № 3 – „Калибратори”.
2. Техническа информация за предложените уреди.
3. Оторизационни документи от производителя.

Best regards,

Angel Angelov
mobile: +359 88 962 7432
mail: angelov@unitech-bg.com
www.unitech-bg.com
48 "General Yosif V. Gurko" Str.
1000 Sofia Center, Bulgaria

This email was scanned by Bitdefender



CALYS 150

Advanced documenting multifunction
calibrator thermometer

CALYS 150, most advanced documenting multifunction instrument of the range, works not only as a simulator (IN / OUT) but also as a **dual channel thermometer (IN / IN)**. It calibrates **HART transmitters** (HART communicator integrated) and **thermistors**.

Description

CALYS 150 field documenting multifunction calibrator is the top instrument of the range. It is the perfect tool for advanced process maintenance and use on test bench in all industries. Suitable for all field and lab measurements, it can simultaneously measure and generate over two isolated channels various signals of temperature, resistance, process, pressure and frequency in one single instrument. CALYS 150 does not only work as a simulator (IN / OUT) but also as a **dual channel thermometer (IN / IN)** to perform comparison calibration. It calibrates **HART transmitters** (HART communicator integrated into ACL500 modem) and **thermistors**. Providing **extended functionalities** (temperature simulation, scaling, steps, synthesizer, statistical functions...) and audit trails, CALYS 150 complies with both 21 CFR Part 11 and NADCAP Heat Treatment standards and makes advanced data exploitation and full data traceability easier. High performances for CALYS 150, for advanced use:

- Temperature Up to 0.005 % RDG
- Resistance Up to 0.006 % RDG and 50 K Ω range
- Current: Up to 0.007 % RDG and 100 mA range + Loop Supply 24 V
- Voltage: Up to 0.005 % RDG and 50 V range
- Frequency: Up to 0.01 % RDG and 100 KHz range
- Pressure: With an external pressure module (comparison calibration with a pressure pump)

Using this user-friendly instrument, calibration tasks can be quickly carried out over the whole process chain. Take the 900 g documenting process calibrator to the field with you during the whole week with **10 calibration procedures stored** in the device. Run the procedure after connecting the probes to the instrument (Easy connect system®) and save the results for onsite easy and quick calibration. Back to the office, you can then upload the data on a computer in order to **issue customized calibration certificates** with dedicated calibration software DATACAL. IP 54, fully protected by an antichoc rubber holster, CALYS 150 integrates "easyconnect" terminals and a wide backlite display that makes it easy to use in any severe or dark conditions. When used with an external pressure module (ref. ACL433), CALYS 150 can measure and simulate pressure (comparison calibration with a pressure pump). CALYS 150 has also the capability to drive baths and dry-blocks when associated with the specific cable (ref. ACL600).

Easy connection system



Connect your probes by simply pushing on the terminal top and insert wires of up to 3 mm or 10 AWG diameter and compensated thermocouple connectors. Wires are held tight between two brass plates ensuring thermal stability and a very good cold junction compensation for thermocouples. This system also enables 4 mm banana plugs and security connectors to be connected on the terminal top.

CALYS series, 4 models from basic use to advanced performances

Specifications		CALYS 50	CALYS 75	CALYS 100	CALYS 150
Top accuracy		200 ppm		130 ppm	50 ppm
Temperature accuracy	Thermocouples (14) RTDs (12)	0.013% RDG for Tc K 0.012% RDG		0.01% RDG for Tc K 0.01% RDG	0.005% RDG for Tc K 0.006% RDG
DC current + Loop supply 24 V	Range Accuracy	50 mA 0.0175% RDG			100 mA 0.007% RDG
DC voltage	Range Accuracy	50 V IN / 20 V OUT 0.013% RDG	50 V 0.013% RDG	50 V 0.010% RDG	50 V 0.005% RDG
Frequency	Range Accuracy	20 KHz IN / 10 KHz OUT 0.005% RDG			100 KHz 0.01% RDG
Resistance	Range Accuracy	4000 Ω 0.012% RDG		4000 Ω 0.010% RDG	50 K Ω 0.006% RDG
Pressure	Range Accuracy		Relative pressure: 30 bar / Absolute pressure: 1,000 bar 0.05% RDG		
Compliance to standards					21 CFR Part 11
					NADCAP Heat

				treatment AMS 2750
Additional functions	Advanced data exploitation: Scaling, relative measurement, simulation of ramps and steps, synthesizer, square root, statistical functions Transmitter function			
Additional functions		Switch test Calibration of transmitters		
Additional functions				Comparison calibration HART: Digital calibration and data transfer Calibration of thermistors
Software		DATACAL calibration software for configuration and data management		
Memory		10,000 data stored and recalled on screen as curve or list		

Specifications

Specifications and performances in temperature @23°C ±5°C

Uncertainty is given in % of reading (CALYS 150 display) + fixed value.

Resistive probes: Measurement and simulation

Sensor	Range (Input and Output)	Resolution	Accuracy / 1 year (Measurement)	Accuracy / 1 year (Simulation)
Pt50 ($\alpha = 3851$)	-220°C to +850°C	0.01°C	0.006% RDG + 0.04°C	0.006% RDG + 0.04°C
Pt100 ($\alpha = 3851$)	-220°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt100 ($\alpha = 3916$)	-200°C to +510°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt100 ($\alpha = 3926$)	-210°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt200 ($\alpha = 3851$)	-220°C to +850°C	0.01°C	0.006% RDG + 0.04°C	0.006% RDG + 0.04°C
Pt500 ($\alpha = 3851$)	-220°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt1000 ($\alpha = 3851$)	-220°C to +740°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Ni100 ($\alpha = 618$)	-60°C to 180°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C
Ni120 ($\alpha = 672$)	-40°C to +205°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C
Ni1000 ($\alpha = 618$)	-60°C to +180°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C
Cu10 ($\alpha = 427$)	-50°C to 150°C	0.10°C	0.006% RDG + 0.18°C	0.006% RDG + 0.18°C
Cu50 ($\alpha = 428$)	-50°C to +200°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C

Resistive probes measurements in 2, 3 or 4 wires: automatic recognition of number of connected wires, with indication on screen Accuracies are given for 4-wire mounted probes Take into account particular error of temperature sensor used and implementation conditions Admissible measuring current: 0.01 mA to 4 mA In simulation mode, specifications given for 1 mA measuring current (Pt50 / 100, Ni100 / 120, Cu10 / 50) or 0.1 mA (Pt200 / 500 / 1000, Ni1000) Temperature coefficient: < 10% of accuracy /°C

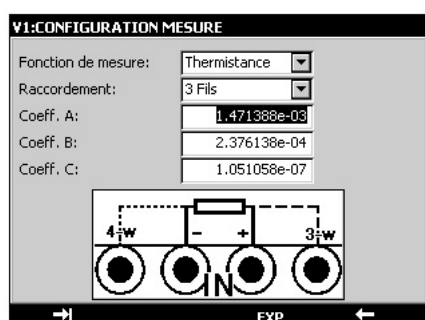
Thermocouples: Measurement and simulation

Type	Input range	Resolution	Accuracy / 1 year (Measurement)	Output range	Resolution	Accuracy / 1 year (Simulation)
K	-250 to -200°C -200 to -120°C -120 to +1372°C	0.10°C 0.05°C 0.01°C	0.50°C 0.15°C 0.005% RDG + 0.08°C	-250 to -50°C -50 to +120°C +120 to +1020°C +1020 to +1370°C	0.01°C 0.01°C 0.01°C 0.01°C	0.15% RDG 0.06°C 0.005% RDG + 0.05°C 0.007% RDG + 0.05°C
T	-250 to -200°C -200 to -100°C -100 to +80°C +80 to +400°C	0.1°C 0.01°C 0.01°C	0.50°C 0.05% RDG + 0.06°C 0.015% RDG + 0.07°C 0.06°C	-250 to -100°C -100 to +0°C +0 to +400°C	0.01°C 0.01°C 0.01°C	0.1% RDG + 0.05°C 0.02% RDG + 0.06°C 0.055°C
J	-210 to -120°C -120 to +60°C +60 to +1200°C	0.01°C 0.01°C 0.01°C	0.15°C 0.005% RDG + 0.07°C 0.0025% RDG + 0.06°C	-210 to +0°C +0 to +50°C +50 to +1200°C	0.01°C 0.01°C 0.01°C	0.03% RDG + 0.08°C 0.05% RDG + 0.07°C 0.005% RDG + 0.04°C
R	-50 to +150°C +150 to +550°C +550 to 1768°C	0.20°C 0.10°C 0.01°C	+0.60°C +0.30°C +0.30°C	-50 to +0°C +0 to +350°C +350 to +1768°C	0.01°C 0.01°C 0.01°C	0.35% RDG + 0.4°C +0.4°C +0.25°C
S	-50 to +150°C +150 to +550°C +550 to +1450°C +1450 to +1768°C	0.20°C 0.10°C 0.05°C 0.05°C	0.80°C 0.30°C 0.30°C 0.35°C	-50 to +0°C +0 to +350°C +350 to +1768°C	0.01°C 0.01°C 0.01°C	0.25% RDG + 0.4°C 0.30°C 0.25°C
B	+400 to +900°C +900 to +1820°C	0.10°C 0.05°C	0.005% RDG + 0.4°C 0.005% RDG + 0.2°C	+400 to +900°C +900 to +1820°C	0.01°C 0.01°C	0.005% RDG + 0.4°C 0.005% RDG + 0.2°C
U	-200 to -100°C -100 to +660°C	0.01°C 0.01°C	+0.13°C +0.09°C	-200 to +400°C +400 to +600°C	0.05°C 0.05°C	+0.09°C +0.11°C
N	-240 to -190°C -190 to -110°C -110 to +0°C +0 to +400°C	0.10°C 0.05°C 0.01°C 0.01°C 0.01°C	0.25% RDG 0.10% RDG 0.04% RDG + 0.06°C 0.08°C 0.005% RDG	-240 to -200°C -200 to +10°C +10 to +250°C +250 to	0.01°C 0.01°C 0.01°C 0.01°C	0.15% RDG +0.10°C +0.08°C 0.008% RDG + 0.05°C

	+400 to +1300°C		+ 0.06°C	+1300°C		
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Thermocouples: PlatineL, Mo, NiMo/NiCo, G, D, L, C: For specifications, refer to the instruction manual (Available on request) Accuracy is given for reference @ 0°C. When using the internal reference junction (except couple B) add an additional uncertainty of 0.2 °C at 0 °C. It is possible (thermocouple B excepted) to choose by programming the cold junction localization: External at 0°C, internal (temperature compensation of instrument's terminals) or manually entered. Temperature coefficient: <10% of accuracy /°C Display unit: °C and F.

Thermistors: Measurement (Channel 1)



With 50 Kohms range and Steinhart – Hart equation integrated, thermistors can be entered into CALYS 150 and tested. Steinhart-hart equation is as follows: $\frac{1}{T} = A + B (\ln(R)) + C(\ln(R))^3$ Where: A, B and C are usually calculated according to temperature at 0°C, 25°C and 70°C

Specifications and performances in pressure @23°C ±5°C

Pressure: Measurement by external digital sensor



Range	0-1 bar	0-3 bar	0-10 bar	0-30 bar	0-100 bar	0-300 bar	0-1000 bar
Absolute	X	X	X	X	X	X	X
Relative	X	X	X	X			

Available in relative, absolute and differential pressure. Connector: ¼ gas Resolution: 0.02% FS Accuracy: -0.05% FS from 10 to 40°C - 0.1% FS from -10 to +10°C and from 40 to 80°C This digital pressure module ACL433 is connected to CALYS 150 through RS485 serial cable to the digital input connector. All data are digital. Measurements are compensated in temperature by a polynomial correction implemented into the firmware at factory.

Specifications and performances in process @23°C ±5°C

DC current: Measurement

With or without loop supply

Range	Measurement range	Res.	Accuracy / 1 year	Rin
0-20 mA	0 mA to 24 mA	0.1 µA	0.007% RDG + 0.8 µA	< 30 Ω
4-20 mA	3 mA to 24 mA	0.1 µA	0.007% RDG + 0.8 µA	< 30 Ω
100 mA	0 mA to 100 mA	0.1 µA	0.009% RDG + 2 µA	< 30 Ω

Temperature coefficient: < 7 ppm/°C from 0°C to 18°C and 28°C to 50 °C Loop supply: 24 V ± 10% HART® compatibility: Input impedance Rin = 280 Ω Display with linear or quadratic scaling

DC voltage: Measurement

Range	Measurement range	Res.	Accuracy / 1 year	Rin
+100 mV	-10 mV to +100 mV	1 V	0.005% RDG + 2 µV	> 10 MΩ
+1 V	-100mV to +1 V	10 V	0.005% RDG + 8 µV	> 10 MΩ
+10 V	-1 V to +10 V	100 V	0;007% RDG + 80 µV	= 1 MΩ
+50 V	-5 V to +50 V	1 mV	0;007% RDG + 0.5 mV	= 1 MΩ

Frequency, counting: Measurement

Range	Resolution	Accuracy / 1 year
10 kHz	< 0.01 Hz	0.01% RDG
100 kHz	0.1 Hz	0.01% RDG

Scale unit: Pulse / min and Hz Trigger level: 1 V Measurement on frequency signals or dry contacts. Counting will be performed on defined time or infinite time.

Resistance: Measurement

Range	Measurement range	Resolution	Accuracy / 1 year
400 Ω	0 to 400 Ω	1 mΩ	0.006% RDG + 8 mΩ
3600 Ω	0 to 3600 Ω	10 mΩ	0.006% RDG + 50 mΩ

50 k Ω	0 to 50 k Ω	100 m Ω	0.008% RDG + 1 Ω
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Resistance measurement in 2, 3 or 4 wires: automatic recognition of number of connected wires, with indication on screen Accuracies are given for 4-wire mounted probes

DC current: Emission

With or without loop supply

Range	Resolution	Accuracy / 1 year
24 mA	0.1 μ A	0.007% RDG + 0.8 μ A
4-20 mA	0.1 μ A	0.007% RDG + 0.8 μ A
0-20 mA	0.1 μ A	0.007% RDG + 0.8 μ A

Temperature Coefficient < 7 ppm/°C from 0°C to 18°C and 28°C to 50 °C Specifications given for CALYS 150 configurations in: - Active mode (+24V ON) 1 Meter in passive mode (+24 V OFF) - Passive mode (+24 V OFF) 1 Meter in active mode (+24 V ON) Pre-programmed steps 0% 25% 50% 75% 100% 4-20 mA linear 4 8 12 16 20 0-20 mA linear 0 5 10 15 20 4-20 mA quad 4 5 8 13 20 0-20 mA quad 0 1.25 5 11,25 20 4-20 mA valves 3.8-4—4.2 12 19, 20, 21

DC voltage: Emission

Range	Emission range	Res.	Accuracy / 1 year	Min load
+100m V	-5m V to +100 mV	1 V	0.005% RDG + 2 V	1 k Ω
+1 V	-5mV to +1 V	10 V	0.005% RDG + 8 V	2 k Ω
+10 V	-100mV to +10 V	100 V	0.007% RDG + 80 V	4 k Ω
+50 V	-100 mV to + 50 V	1 mV	0.007% RDG + 0.5 mV	4 k Ω

Frequency, pulse: Emission

Range	Resolution	Accuracy / 1 year
1000 Hz	0.01 Hz	0.01% RDG
100 kHz	1 Hz	0.01% RDG

Scale unit: Pulse / min and Hz Pulse emission and dry contacts simulation. Max. amplitude: 20 V (User selectable)

Resistance: Emission

Range	Emission range	Res.	Accuracy / 1 year	Nota: lext
400 Ω	1 to 400 Ω	10 m Ω	0.006% RDG + 20 m Ω	0.1 mA / 4 mA

3600 Ω	10 to 3600 Ω	100 m Ω	0.006% RDG + 100 m Ω	0.1 mA / 4 mA

Emission with pulsed current available: refer to the instruction manual for specifications

Temperature coefficient: < 5 ppm/°C from 0°C to 18°C and 28°C to 50 °C. Current establishing time: <1ms Compatibility with smart transmitters text : Current received by the calibrator

Further features

Scaling in measurement and simulation modes

Scaling allows process signals to be displayed in % of FS or in all other units. This function also allows sensors to be corrected after a calibration.

Relative measurement

Models and accessories

Instrument:

CALYS 150 On-site documenting multifunction calibrator Delivered in standard with:

- Quick start manual
- Battery charger
- Set of 6 testing leads
- Carrying strap
- Factory test report

Accessories:

ACL433 External digital pressure sensor for CALYS 75 / 100 / 150 (Absolute or relative pressure) Different ranges available from 0 to 1,000 bar Range from -1 -> 1; 3; 10; 30 (absolute or relative pressure) Range from -1 -> 100; 300; 1,000 (absolute pressure only) Standard accuracy: 0.05% FS AN6050 Transport case for CALYS series ACL9311 Set of 6 measuring cables with removable crocodile clips ACL500 Hart modem for CALYS 150 ACL600 Cable to drive temperature dry blocks and baths for CALYS 150 *Please ask before for compliance with your bath / dry-block.*

Software:

DATA CAL Calibration software for CALYS 75 / 100 / 150 Supplied with USB cable

Certification:

QMA11EN COFRAC certificate of calibration With all relevant data points where the device has been tested AMS 2750 Compliance certificate to NADCAP AMS 2750 standard

Packing information:

Size 210 mm x 110 mm x 50 mm Weight without packing 900 g

CX 1652 Multifunction Laboratory Calibrator



For checking your instruments in the laboratory

- AC / DC voltage up to 1,000 V
- AC / DC current up to 30 A
- Resistance up to 1,000 M Ω
- Capacitance up to 100 μ F
- Simulation of TC / RTD temperature sensors
- Frequency up to 20 MHz
- 240 V / 20 A electric power / energy
- Built-in process multimeter
- GPIB & RS232 interfaces

As well as the standard electrical parameters, the CX 1652 generates others for temperature and energy applications.

Ideal for calibrating and adjusting instruments:

(multimeters, analogue instruments, switchboard equipment, current clamps, portable calibrators, wattmeters, electrometers, oscilloscopes, thermometers, loggers, etc.)

- Measuring instrument manufacturers,
- Laboratories,
- After-sales departments,
- Metrology departments, R&D teams, etc.
- For instrument certification, quality, etc.

Multiple functions

- Generation of AC/DC voltage, current and power
- Generation of periodic non-harmonic signals with crest factor
- Generation of square signals with programmable amplitude and frequency
- Simulation of resistors and capacitors
- Simulation of RTD resistive sensors and thermocouples (R, S, B, J, K, T, E, N)
- Built-in multimeter for testing and calibrating transmitters, controllers and testers without additional equipment

Ergonomics for easy use

- Large LCD screen
- Display of menus, parameters and other useful information: uncertainties, etc.
- Keys for direct access to the main functions



Check your current clamps particularly simply



Calibrate your temperature sensors

AC / DC voltage up to 1,000 V

Range	% value + μ V	% value + μ V	% value + μ V	% value + μ V
	DC	20 Hz - 10 kHz	10 kHz - 50 kHz	50 kHz - 100 kHz
0 mV - 20 mV	0.005 + 6	0.2 + 30	0.20 + 40	1.0 + 40
20 mV - 200 mV	0.0015 + 8	0.1 + 80	0.15 + 120	0.3 + 120
200 mV - 2 V	0.0012 + 10	0.018 + 100	0.05 + 200	0.2 + 1,000
2 V - 20 V	0.0010 + 50	0.018 + 1,000	0.05 + 6,000	0.2 + 10,000
20 V - 240 V	0.0015 + 500	0.018 + 10,000	--	--
240 V - 1,000 V	0.005 + 20,000	0.03 + 200,000 *	--	--

*Max. frequency 1000 Hz

- ☒ Frequency uncertainty: 0.005 %
- ☒ Voltage frequency: 20 Hz to 100 kHz
- ☒ Resolution: 6½ digits

AC / DC current from 1 μ A to 30 A

Range	% value + μ A	% value + μ A	% value + μ A	% value + μ A
	DC	20 Hz - 1 kHz	1 kHz - 5 kHz	5 kHz - 10 kHz
1 μ A - 200 μ A	0.05 + 0.02	0.15 + 0.02	0.30 + 0.22	--
200 μ A - 2 mA	0.02 + 0.1	0.07 + 0.2	0.20 + 1	0.50 + 1.4
2 mA - 20 mA	0.01 + 0.6	0.05 + 1	0.20 + 10	0.50 + 14
20 mA - 200 mA	0.01 + 6	0.05 + 10	0.20 + 100	0.50 + 140
200 mA - 2 A	0.015 + 100	0.05 + 100	--	--
2 A - 20 A	0.02 + 2,000	0.10 + 6,000	--	--
20 A - 30 A *	$[0.02 + 0.003 \cdot (I-20)] + 2,000$	$[0.1 + 0.003 \cdot (I-20)] + 6,000$	--	--

*I is the current value selected in A

0.3 % additional uncertainty when the 140-50 coil option is applied. The output current is multiplied by a factor of 25 or 50.

- ☒ Frequency uncertainty: 0.005 %
- ☒ Current frequency: 20 Hz to 10 kHz
- ☒ Resolution: 6½ digits

Waveform function (non-harmonic signal)

- ☒ Voltage range: 1 mV to 200 V
- ☒ Current range: 100 μ A to 2 A
- ☒ Output signal waveform:
positive square, negative square,
symmetrical square, triangle A,
triangle B, limited-sine triangle with
distortion $k = 13.45$ %
- ☒ Peak value accuracy: 0.3% + 50 μ V
- ☒ Displayed value: Peak, calculated
rms value
- ☒ Frequency calibre: 1,000 Hz for AC
voltage, 120 Hz for AC current

The smallest frequency for slot signals
is 0.1 Hz. For other signals, it is 20 Hz.

Resistance and Capacitance

Resistance range	% value + m Ω
0 Ω - 10 Ω	0.03 + 5
10 Ω - 33 Ω	0.015 + 5
33 Ω - 100 Ω	0.010 + 5
100 Ω - 330 Ω	0.010 + 5
330 Ω - 1 k Ω	0.010
1 k Ω - 3.3 k Ω	0.010
3.3 k Ω - 10 k Ω	0.010
10 k Ω - 33 k Ω	0.010
33 k Ω - 100 k Ω	0.010
100 k Ω - 330 k Ω	0.010
330 k Ω - 1 M Ω	0.010
1 M Ω - 3.3 M Ω	0.020
3.3 M Ω - 10 M Ω	0.050
10 M Ω - 33 M Ω	0.1
33 M Ω - 100 M Ω	0.2
100 M Ω - 1000 M Ω	0.5

Capacitance range *	% value + pF
700 pF - 1 nF	0.5 + 15
1 nF - 3.3 nF	0.5 + 5
3.3 nF - 10 nF	0.5
10 nF - 33 nF	0.5
33 nF - 100 nF	0.5
100 nF - 330 nF	1
330 nF - 1 μ F	1
1 μ F - 3.3 μ F	1.5
3.3 μ F - 10 μ F	1.5
10 μ F - 100 μ F	2.0

- ☒ Resistance range: 0 to 1,000 M Ω
- ☒ Resolution: 4 digits
- ☒ Capacitance range: 900 pF to 100 μ F

* The max. test voltage applicable on the output terminals is 2 to 5.5 Vrms.

DC/AC electric power and energy

- ☒ Voltage range: 0.2 V to 240 V
- ☒ Current range: 2 mA to 20 A
- ☒ Electric power range: 0.0004 to 2.4 kVA
- ☒ Time selection: 1.1 s to 1999 s
- ☒ Frequency range: DC, 40 Hz to 400 Hz
- ☒ Frequency accuracy: 0.005 %
- ☒ AC power accuracy: $dP = \sqrt{(dU^2 + dI^2 + dPF^2 + 0.03^2)}$ [%]
- ☒ DC power accuracy: $P = \sqrt{(dU^2 + dI^2 + 0.01^2)}$ [%]
- ☒ Power Factor accuracy: $dPF = (1 - \cos(\varphi + d\varphi) / \cos \varphi) \cdot 100$ [%]

CX 1652 - the high-accuracy, high-stability multifunction calibrator

Frequency function

PWM mode

Voltage range	% value + mV
1 mV - 20 mV	0.2 + 0.1
20 mV - 200 mV	0.1 + 0.1
200 - 2 V	0.1 + 0.1
2 V - 10 V	0.1 + 0.1

HF mode

- ☒ Frequency range: 0.1 Hz to 20 MHz
- ☒ Output impedance: 50 Ω
- ☒ Output signal waveform: square, symmetrical
- ☒ Output signal amplitude: 4 V pk-pk

- ☒ Output amplitude: 0, -10, -20 dB, -30 dB $\pm$ 1 dB
- ☒ Amplitude accuracy: 10 %
- ☒ Rise and fall time: < 3 ns

- ☒ Frequency range: 0.1 Hz to 20 MHz
- ☒ Resolution: 6 digits
- ☒ Frequency accuracy: 0.005 %

- ☒ Mode: PWM, square signal with calculated duty cycle ratio, frequency and HF amplitude

RTD: temperature sensor simulation

Type	Range -200 to +250 °C	Range 250 - 850 °C
Pt100	0.1 °C	0.3 °C
Pt200	0.1 °C	0.2 °C
Pt1000	0.2 °C	0.4 °C
Ni100	0.07 °C	- -

- ☒ Standard sensor: DIN, US/JS, Ni,
- ☒ selectable R0: 20 Ω to 2 k Ω

TC: temperature sensor simulation

R	Range [°C]	-50 - 0	0 - 400	400 - 1000	1000 - 1767
Accuracy [°C]		2.0	1.5	0.9	1.0
S	Range [°C]	-50 ... 0	0 ... 250	250 ... 1400	1400 ... 1767
Accuracy [°C]		1.8	1.5	1.0	1.0
B	Range [°C]	400 ... 800	800 ... 1000	1000 ... 1500	1500 ... 1820
Accuracy [°C]		1.9	1.1	1.0	0.9
J	Range [°C]	-210 ... -100	-100 ... 150	150 ... 700	700 ... 1200
Accuracy [°C]		0.6	0.4	0.3	0.4
T	Range [°C]	-200 ... -100	-100 ... 0	0 ... 100	100 ... 400
Accuracy [°C]		0.6	0.4	0.3	0.4
E	Range [°C]	-250 ... -100	-100 ... 280	280 ... 600	600 ... 1000
Accuracy [°C]		0.9	0.3	0.2	0.2
K	Range [°C]	-200 ... -100	-100 ... 480	480 ... 1000	1000 ... 1372
Accuracy [°C]		0.7	0.4	0.4	0.5
N	Range [°C]	-200 ... -100	-100 ... 0	0 ... 580	580 ... 1300
Accuracy [°C]		1.0	0.5	0.5	0.5

General data

Heating time	60 min
Working temperature	23 °C $\pm$ 10 °C
Storage temperature	0 to 40 °C with humidity below 80 %RH
Reference temperature	23 °C $\pm$ 2 °C
Dimensions	450 x 480 x 150 mm
Weight	22 kg
Mains power supply	230 V - 50 Hz
Consumption	Max. 250 VA

Built-in process multimeter

Function	Range	Accuracy (%)	Resolution / Range
DC voltage - VDC	0 to $\pm$ 20 V	0.01 % + 500 μ V	100 μ V / 20 V
DC current	0 to $\pm$ 25 mA	0.015 % + 300 nA	100 nA / 20 mA
DC voltage - mVDC	0 to $\pm$ 2 V	0.02 % + 7 μ V	100 nV / 20 mV 1 μ V / 200 mV 10 μ V / 2 V
Resistance *	0 to 2.5 k Ω	0.02 % + 10 m Ω	4 m Ω / 20 Ω 1 m Ω / 200 Ω 10 m Ω / 2 k Ω
Frequency	1 Hz to 15 kHz	0.005	10 μ Hz to 0.1 Hz
TC simulation	-250 to +1820 °C	0.4 to 2.5 °C	0.1 °C
RTD simulation	-200 to +850 °C*	0.1 °C	0.1 °C

*1mA test current

State at delivery

CX 1652 calibrator delivered with:

- ✓ Mains power cable, User's Manual (CD),
- ✓ 2 x 1000V - 20 A test cables, black / red 1m long,
- ✓ Adapter cable: SUB-D25 / 2 x banana 1 m long (DC voltage/current),
- ✓ Adapter cable: SUB-D25 / 4 x banana 1 m long (4-wire resistance),
- ✓ Adapter cable: SUB-D25 / 4 x banana 1m long (4-wire resistance simulation),
- ✓ Adapter cable: SUB-D25 / 2 x banana 1 m long (mVDC and TC), spare fuses,
- ✓ RS232 cable 1m long.
- ✓ Test Report

Reference for orders:

CX 1652 calibrator CX1652

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

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

MIDDLE EAST
CHAUVIN ARNOUX MIDDLE EAST
 P.O. BOX 60-154
 1241 2020 JAL EL DIB - LEBANON
 Tel: +961 1 890 425
 Fax: +961 1 890 424
 camie@chauvin-arnoux.com
 www.chauvin-arnoux.com



High-Precision Multifunction Calibrator for Voltage, Current, Thermocouples, RTDs, Resistance and Frequency

DIGISTANT® MODEL 4463 NEW



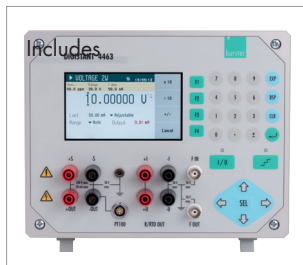
Initial calibration (DAkKS) included



USB



Ethernet



Frontseite



Rückseite mit Anschlüssen

Highlights

- DC voltage ± 100 nV ... ± 100 V (accuracy from 0.002 %)
- DC current ± 100 nA ... ± 50 mA (accuracy 0.005 % ± 1 μ A)
- 12 thermocouple types (accuracy from 0.1 K)
- 32 automatic ramp functions per measured variable, each with 100 values
- LabView driver for software integration

Options

- RTD simulation Pt100 ... Pt1000, Ni100 ... Ni1000
- User-specific RTD profiles
- True ohmic resistance simulation 10 Ω ... 300 k Ω
- Frequency simulation 10 mHz ... 15 kHz
- Frequency measurement 10 mHz ... 100 kHz

Applications

- Testing DC voltage and current measuring devices
- Testing thermocouple and temperature measuring instruments
- Controlling process sequences using the ramp function
- Calibration of RTD and thermocouple displays
- Calibration of controllers, sensors and PLC analog inputs
- Calibration of multimeters and other devices

Product description

The DIGISTANT® model 4463 is a high-precision calibration source with impressive versatility and accuracy. Every device is supplied with a DAkKS certificate. Compared to other calibrators, it offers a better error limit of 0.002 % across the entire voltage range.

To achieve consistently high quality levels and conform to standards and regulations, measuring instruments of all kinds require regular calibration. The DIGISTANT® model 4463 provides many of the functions needed for this purpose. Inaccuracies caused by the measuring leads can be compensated via sense lines using 4-wire technology.

All relevant information about the parameter settings and the accuracy being achieved is clearly laid out on the high-resolution color display. The dynamic menu system is navigated intuitively. Range selection is automatic or manual. Values can be entered precisely using the numeric or cursor keypad.

The device can be controlled via its Ethernet, USB or RS-232 port. LabView drivers for software integration are available free of charge. SCPI commands are listed in the user manual. 32 ramp functions per range with 100 value/time sequences can be automatically saved and started.

For thermocouples, scales including ITS-90 and IPTS-68, reference junction type constant or external, can be selected. An optionally available external Pt100 reference junction with calibration data taken into account in the device minimizes thermal EMFs and results in even smaller uncertainties in the measurement chain.

Technical Data

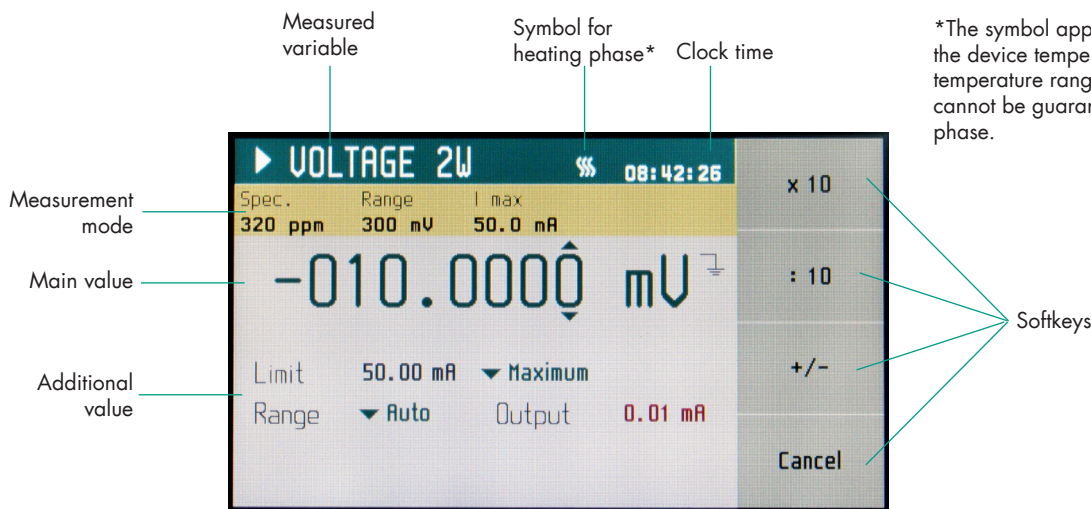
DC voltage					
Range		±300 mV	±3 V	±30 V	±100 V
Resolution		100 nV	1 µV	10 µV	100 µV
Accuracy (1 year)		0.002 % +3 µV	0.002 % +20 µV	0.002 % +200 µV	0.002 % +1 mV
Maximum load		50 mA			25 mA
DC current					
Range		±25 mA		±50 mA	
Resolution		100 nA			
Accuracy (1 year)		±0.005 % + 1 µA			
Maximum load		100 V		30 V	
Thermocouple simulation					
Type		R (EN60584-1/ITS90)	S (EN60584-1/ITS90)	B (EN60584-1/ITS90)	J (EN60584-1/ITS90)
Range		-50 °C ... +1768 °C	-50 °C ... +1768 °C	+400 °C ... +1820 °C	-210 °C ... +1200 °C
Accuracy (1 year)		±0.3 K (+400 ... +1768 °C)	±0.4 K (+100 ... +1768 °C)	±0.4 K (+800 ... +1820 °C)	±0.1 K (-180 ... +1200 °C)
Type		T (EN60584-1/ITS90)	E (EN60584-1/ITS90)	K (EN60584-1/ITS90)	N (EN60584-1/ITS90)
Range		-200 °C ... 400 °C	-250 °C ... 1000 °C	-200 °C ... 1372 °C	-200 °C ... 1300 °C
Accuracy (1 year)		±0.1 K (-100 ... +400 °C)	±0.1 K (-200 ... +1000 °C)	±0.1 K (-100 ... +900 °C)	±0.1 K (-100 ... +900 °C)
Type		M (General Electric IPTS68)	C (Hoskins ITS90)	D (Hoskins ITS90)	G2 (Hoskins ITS90)
Range		-50 °C ... +1410 °C	0 °C ... +2315 °C	0 °C ... +2315 °C	0 °C ... +2315 °C
Accuracy (1 year)		±0.1 K (-50 ... +1410 °C)	±0.2 K (+100 ... +900 °C)	±0.2 K (+300 ... +1100 °C)	±0.2 K (+300 ... +2100 °C)
Resolution		0.01 °C			
External reference junction		Range	Resolution	Accuracy (1 year)	-
		-50 °C ... +150 °C	0.001 °C	±0.3 K	-
RTD simulation (only with -V0001)					
Type		Pt100 ... Pt1000	Pt100 ... Pt1000	Ni100 ... Ni1000	
Range		-200 ... 0 °C	0 ... +850 °C	-60 ... +300 °C	
Resolution		0.01 °C			
Accuracy (1 year)		±0.15 °C	±0.2 °C	±0.1 °C	
True ohmic resistance simulation (only with -V0001)					
Range		10 Ω ... 20 Ω	200 Ω	1 kΩ	3 kΩ
Resolution		100 µΩ	1 mΩ	10 mΩ	100 mΩ
Accuracy (1 year)		±0,05 % + 15 mΩ	±0,05 % + 15 mΩ	±0,02 % + 0 Ω	±0,02 % + 0 Ω
Range		10 kΩ	30 kΩ	100 kΩ	300 kΩ
Resolution		1 Ω	10 Ω	100 Ω	1 kΩ
Accuracy (1 year)		±0.02 % + 0 Ω	±0.05 % + 0 Ω	±0.1 % + 0 Ω	±0.5 % + 0 Ω
Frequency output (only with -V0001)					
Range		10 ... 200 mHz	2000 mHz	20 Hz	200 Hz
Resolution		100 nHz	1 µHz	10 µHz	100 µHz
Accuracy (1 year)		±0.005 %			
Range		2 kHz	4 kHz	10 kHz	15 kHz
Resolution		10 mHz	100 mHz	1 Hz	10 Hz
Accuracy (1 year)		±0.005 %	±0.01 %	±0.06 %	±0.15 %
Output		Open collector, max. 30 V/50 mA or internal pull-up 100 Ω to +5 V (±10 %)			
Frequency measurement (only with -V0001)					
Range		10 mHz ... 100 kHz			
Frequency resolution		5½ digits			
Accuracy (1 year)		0.005 %			
Ambient conditions					
Reference temperature		23 °C ±10 °C (voltage, current, thermocouple simulation and frequency)			
		23 °C ±2 °C (RTD and resistance)			
Operating temperature		+5 °C ... +45 °C			
Storage temperature		-10 °C ... +55 °C			

General data

Communication interface		RS-232 (D-sub 9), USB slave port (type B), Ethernet Western socket (RJ45)
Auxiliary supply		115 V/230 V $\pm 10\%$, 47 ... 63 Hz
Power consumption max.		60 W
Fuse		230 V: T 315 mA / L 250 V
		115 V: T 630 mA / L 250 V
Size		220 x 173 x 320 (W x H x D / mm)
Weight		5.7 kg

Source main menu

Description



PRESETS			Save
Preset	Function	Date	
00 Startup	TC	30.07.2020	Load
01 TEST_01	Current	19.08.2020	
02 TEST_02	Voltage	19.08.2020	
03 Freq50Hz	Frequency	19.08.2020	Clear
04 901	RTD	19.08.2020	
05 R1000	Resistance	19.08.2020	Exit
06 ---	---	---	
07 ---	---	---	

Auxiliary and main parameters for all functions can be saved via the presets. Otherwise they would be lost when the device restarts.

Startup (position 00) loads automatically each time the device starts.

Up to 100 presets can be saved and used later as required, avoiding the need to re-enter all the parameters. This function is particularly useful for recurring test scenarios, where it saves a lot of time.

CURRENT		Function
Step	STEP1	
30.0000 mA		Settings
Output current limiting !		Preset
Limit	30.00 V	
Range	50 mA	Menu
Output		
29.97 V		

Press the STEP button to start the ramp function. Generally it is also possible to control the device remotely and access all functions via the interfaces and LabView drivers, which are available free of charge.

32 ramps can be stored for each measured variable (time sequences).

Up to 100 steps per sequence can be saved (amplitude/time).

Accessories

Calibration certificate with accreditation symbol

The initial calibration is included with the purchase of this product.

We recommend a recalibration according to the recalibration deadlines specified.

Further information at: www.burster.com



DAkkS
 Deutsche
 Akkreditierungsstelle
 D-K-15141-01-00

burster calibration services according
 to the accredited scope of services

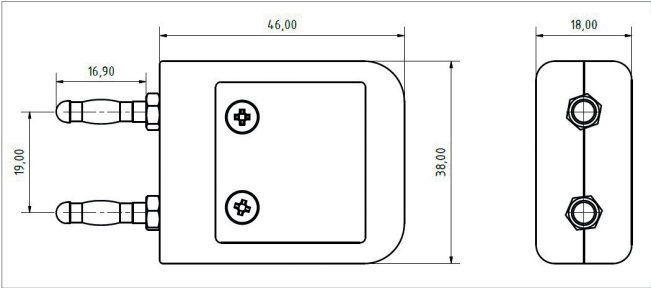
Technical data

Measuring points	44DKD-4463-V0000	44DKD-4463-V0001
Voltage	34	34
Current	28	28
Thermocouple	20	20
RTD (measurement)	5	5
RTD (transmission)	-	8
Resistance	-	26
Frequency (measurement)*	-	6
Frequency (transmission)*	-	5

* Separate factory certificate to supplement the DAkkS certificate

External reference junction model 4485-V001
 for thermocouples (optional)

- For precision simulation of thermocouples
- Integrated Pt100 for temperature measurement
- Thermally stable and decoupled set-up
- Connection: Miniature thermo plug connection



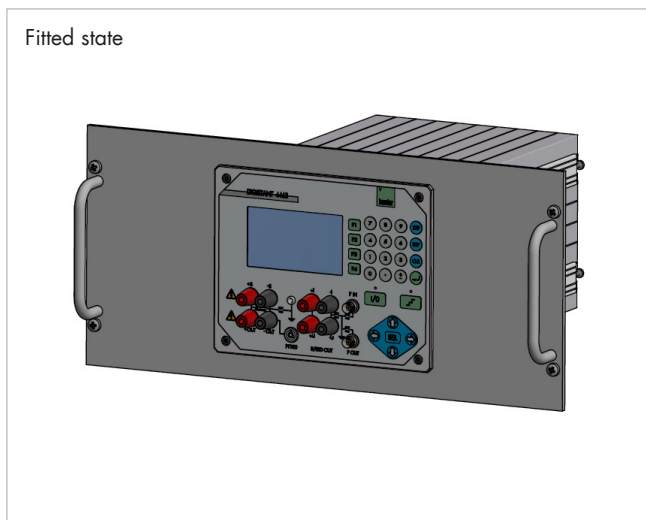
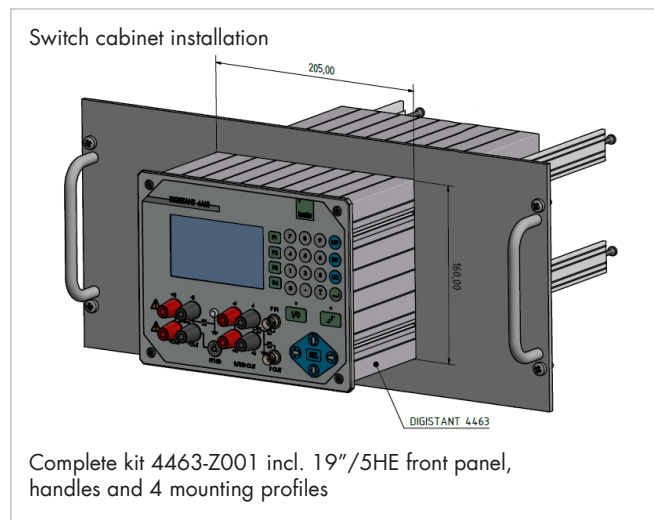
Technical data

4485-V001	
Tolerance	±0.3 K
Long-term drift (stability)	Typically 0.05 K/year
Insulation resistance between the poles in the disconnected state	≥ 20 MΩ
Working temperature range	0 °C ... +23 °C ... +40 °C
Storage temperature range	-10 °C ... +60 °C
Note	Thermo cable and connector cause an additional error. We recommend using Class 1.

DAkkS certificate for external reference junction type 4485-V001

At 3 points (0 °C, +23 °C and +40 °C). If the reference junction is DAkkS-calibrated with the integrated Pt100 sensor and the calculated coefficients are entered in the DIGISTANT® 4463, the additional measurement error for the Pt100 measuring channel can be reduced to ≤ ±0.1 K for a measurement range of +15 °C ... +35 °C.

Mounting kit model 4463-Z001



Accessories

Order code		
4463-Z001		Mounting plate for 19" rack installation
4485-V001		External reference junction with LEMO connector, 0.3 m cable
9900-K333		RS-232 connecting cable, length 3.0 m
9900-K349		USB connecting cable, length 2.0 m
9900-K328		BNC connecting cable, length 3.0 m

Calibration

Calibration certificates		
44DKD-4463-V0000		DKD/DAkS calibration including adjustment and 2nd calibration for version -V0000 (U, I, TC)
44DKD-4463-V0001		DKD/DAkS calibration including adjustment and 2nd calibration for version -V0001 (U, I, TC, R, RTD, f*)
44DKD-4485		DKD/DAkS calibration for external reference junction (Pt100 sensor); calibration points: 0 °C, +23 °C and +40 °C

* Separate factory certificate to supplement the DAkS certificate

Calibration of measuring chain		
44ABG		Calibration of 4463 measuring chain with 4485, only possible in combination with 44DKD-4485 and 4485-V001

Volume discount*

Discount scale		
2 units		2 %
3 units		3 %
5 units		4 %
For larger quantities		POA

* when purchasing identical versions in a single order

Order Code

Order number	Functions
4463-V0000	Basic version with U, I and TC incl. DAkS certificate
4463-V0001	Full version with U, I, TC, RTD, R and f incl. DAkS certificate

Изх. № BGR 1015 / 07.10.2022 г.

До: "АЕЦ Козлодуй" ЕАД
Управление "Търговско"
Отдел "Маркетинг и доставки"

На вниманието на: Христо Пачев - Гл. експерт маркетинг
тел.: + 359 973 7 6140
e-mail: HPatchev@npp.bg
commercial@npp.bg

Относно: **Пазарна консултация № 5039 -**
„Доставка на измервателни прибори“
Обособена позиция № 1 – „Токови
клещи, тестери, мултимери,
фазоуказатели, детектори и др. с
общо предназначение”

Уважаеми г-н Пачев,

Във връзка с Покана за пазарна консултация № 5039 - „Доставка на измервателни прибори“ и Обособена позиция № 1 – „Токови клещи, тестери, мултимери, фазоуказатели, детектори и др. с общо предназначение“ имаме удоволствието да представим нашето

ИНДИКАТИВНО ПРЕДЛОЖЕНИЕ

№	ID	Наименование	Мярка	К-во	Единична Цена в лв. (без ДДС)	Стойност, лв. (без ДДС)
1.	101342	Клещи токови P01120943 CA F403	бр.	1	1050	1050
1a	101342	Клещи токови P01120945 CA F405	бр.	1	1175	1175
1b	101342	Клещи токови Sefram MW 3390	бр.	1	720	720
2.	10269	Пробник за напрежение Multimetrix VT14	бр.	1	55	55
3.	104416	Тестер за напрежение Sefram 66	бр.	11	300	3300
4.	113594	Мултимер Multimetrix DMM230	бр.	1	310	310
5.	134132	Детектор на напрежение безконтактен P01191745Z C.A 732	бр.	6	60	360
6.	43305	Фазоуказател Multimetrix VT12	бр.	1	45	45
7.	75822	Мултимер преносим Multimetrix DMM 240	бр.	4	425	1700
8.	80587	Тестер кабелен SEFRAM95	бр.	2	240	480
9.	9393	Фазомер Multimetrix VT12	бр.	25	45	1125
10.	95705	Детектор (скенер за стена) Multimetrix D45	бр.	5	85	425

ТЪРГОВСКИ УСЛОВИЯ

Цените са в лева, без ДДС, DDP Козлодуй.

Срок на доставка: 80 календарни дни от датата на заявката.

Гаранционен срок: Клеци токови СА 403/405 - 36 месеца / Sefram MW 3390 - 12 месеца / Пробник за напрежение Multimetrix VT14 - 12 месеца / Тестер за напрежение Sefram 66 – 24 месеца / Мултимер Multimetrix DMM230 – 24 месеца / Детектор на напрежение безконтактен P01191745Z C.A 732 – 12 месеца / Фазоуказател Multimetrix VT12 – 24 месеца / Мултимер преносим Multimetrix DMM 240 – 24 месеца / Тестер кабелен SEFRAM95 – 12 месеца / Фазомер Multimetrix VT12 – 24 месеца /

Детектор (скенер за стена) Multimetrix D45 – 12 месеца

Плащане: По банков път, до 30 календарни дни от датата на приемане на доставката на основание на данъчна фактура.

Придружаваща документация: Приемо-предавателен протокол; Гаранционна карта, Ръководство за експлоатация.

Адрес за кореспонденция:

УНИТЕХ КОНТРОЛ ЕООД, 1000 гр. София, ул. "Ген. Йосиф В. Гурко" № 48.

Банкови реквизити: Разплащателна сметка: BG 94 UNCR 7630 1077 5989 99.

ВІС код Уникредит Булбанк АД: UNCRBGSF

ИН по ЗДДС – BG831758563; **ИН по ДОПК** – 831758563.

За контакти: Георги Милушев, моб. 088 850 1235; тел./факс: 02 821 04 05,

e-mail: office@unitech-bg.com.

Валидност на офертата: 1 месец от датата на получаването.

Приложение: Техническа спецификация.

В очакване на Вашия отговор,

УНИТЕХ КОНТРОЛ ЕООД

Заличено на основание ЗЗЛД

Изготвил: инж. А. Ангелов

Управител:

/доц. д-р инж. Г. Милушев/

ТЕХНИЧЕСКА СПЕЦИФИКАЦИЯ
За „Доставка на измервателни прибори“
Обособена позиция № 1 – „Токови клещи, тестери, мултимери, фазоуказатели,
детектори и др. с общо предназначение”

ID	ID производи тел	Описание на артикула
101342	P01120943 CA F403	Клещи токови с цифров дисплей до 1000A AC / 1500A DC; за напрежение до 1000V AC/DC, 50Hz за AC, за кабел с ф до 48mm; за съпротивление до 0.1MΩ, честота от 1.0Hz до 20kHz, с веригопрверител/тестер; с min/max стойност на тока, измерване на непрекъснатост, измерване на температура.
101342	P01120945 CA F405	Клещи токови с цифров дисплей до 1000A AC / 1500A DC; за напрежение до 1000V AC/DC, 50Hz за AC, за кабел с ф до 48mm; за съпротивление до 0.1MΩ, честота от 1.0Hz до 20kHz, с веригопрверител/тестер; с min/max стойност на тока, измерване на непрекъснатост, измерване на температура, измерване на мощност (пълна, реактивна, активна), диоден тест, фактор на мощност, ред на фазите.
101342	Sefram MW 3390	Клещи токови с цифров дисплей до 1000A AC/DC; за напрежение до 750V AC / 1000V DC, 50Hz за AC, за кабел с ф до 51mm; за съпротивление до 400Ω, честота от 1Hz до 10kHz, с веригопрверител/тестер; с min/max стойност на тока, измерване на непрекъснатост със звуков сигнал.

ID	ID производи тел	Описание на артикула
10269	Multimetrix VT14	Пробник за напрежение 12 - 690V
104416	Sefram 66	Тестер за напрежение: измерване на AC/DC напрежение от 6 - 690V, 1999-показания на осветения LCD дисплей, LED индикатори, измерв. съпротивление до 1999 Ом, тест за проводимост, вградена лампа за осветяване на измерваното място, еднополюсен фазоуказател; 239x68x29mm.
113594	Multimetrix DMM230	Мултимер, избор на обхват - ръчен/автоматичен. LCD дисплей /разряд/ - 6000, напрежение DC обхвати 600 mV / 6 V / 60 V / 600 V / 1000 V, Напрежение AC 6 V / 60 V / 600 V / 1000 V, ток DC 600 µA / 6000 µA / 60 mA / 600 mA / 6 A / 10 A, Ток AC 600 µA / 6000 µA / 60 mA / 600 mA / 6 A / 10 A (20 A max.), Съпротивление 600 Ω / 6 kΩ / 60 kΩ / 600 kΩ / 6 MΩ / 60 MΩ, Капацитет 40.01 nF to 1000 µF, Честота 0.001 Hz to 10.00 MHz. Тест на верига, диоди и преходи на транзистори, Батерии 9V / 6F22.
134132	P01191745Z C.A 732	Детектор на напрежение безконтактен - фазомер; диапазон на изходното напрежение 90 ... 600V AC; съответствие със стандарт EN61010 600V CAT IV; фенерче с бял диод LED; светлинна сигнализация за открит проводник под напрежение; светлинна сигнализация за открит захранващ източник.
43305	Multimetrix VT12	Фазоуказател.
75822	Multimetrix DMM 240	Мултимер преносим, автоматични обхвати, аналогов барграф; напрежение AC/DC - 0,001V до 1000V; ток до 10A; разделителна способност 0,1µA; съпротивление - 0,1Ω до 40MΩ; верига със звукова сигнализация; комплект сонди; мек калъф.

ID	ID производи тел	Описание на артикула
80587	SEFRAM95	Тестер кабелен за мрежа 10/100 Base T LAN за кабел UTP, RJ 45, LED индикация.
9393	Multimetrix VT12	Фазомер.
95705	Multimetrix D45	Детектор (скенер за стена), дълбочина на откриване макс.: черни метали - 300mm; цветни метали - 300mm; медни проводници (под напрежение) - 300mm; скрити дървени конструкции - 300mm. Окомплектовка защитна чанта; 1x12V батерия.

MANUFACTURER'S AUTHORIZATION LETTER

Date: 02/04/2021

To: UniTech Control Ltd

WHEREAS **CHAUVIN ARNOUX GROUP** who are established and reputable manufacturers of portable measuring instruments having headquarter at CHAUVIN ARNOUX 12-16 Rue Sarah Bernhardt, 92600 Asnières-sur-Seine, France do hereby authorize:

The Bidder: NPP Kozloduy

Address: 3321 Kozloduy Bulgary

Tel : +359 973 7 20 20

Fax: + 359 973 7 60 73

to purchase, to resell and to supply portable measuring instruments manufactured by our company.

Best regards,

Заличено на основание 33ЛД

M. Philippe CONTANT

Export Manager

Test and Measurement

CHAUVIN ARNOUX

p. o. Mr. Contant.



Marques



metrix

Multimetrix

ALLEMAGNE - AUTRICHE - CHINE - ESPAGNE - ETATS-UNIS - FRANCE - GRANDE-BRETAGNE - ITALIE - MOYEN-ORIENT - SCANDINAVIE - SUISSE

LETTER OF AUTHORISATION

WHEREAS SEFRAM INSTRUMENTS SAS who are established and reputable company of electric measuring and testing instruments, having factories at

32 rue Edouard Martel – 42100 ST ETIENNE - FRANCE

do hereby authorize the UNITECH Company who is established in SOFIA (BULGARIA), to submit a bid and subsequently negotiate and sign the contract with you as per your Invitation to Bid against all the goods manufactured and/or supplied by us.

For and on behalf of manufacturer

Saint-Etienne, France

December 6, 2019

SEFRAM Instruments SAS

Заличено на основание ЗЗЛД

790 833 404

ROGER MARENTHIER
Directeur Commercial

Пачев, Христо Б.

From: Богоева, Юлия К.
Sent: 10 октомври 2022 г. 8:43
To: Пачев, Христо Б.
Сс: Александров, Пламен Г.; Лазарова, Милена Т.
Subject: FW: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 1 – „Токови клещи, тестери, мултимери, фазоуказатели, детектори и др. с общо предназначение”
Attachments: 20221007 Offer Current clamps, testers, multimeters, phase indicators, detectors.pdf; CA 732 Leaflet.pdf; D 45 Manual.pdf; DMM 230-240 Leaflet.pdf; MW3390_datasheet.pdf; SEFRAM66_datasheet.pdf; SEFRAM95_datasheet.pdf; VT 12 Manual.pdf; VT 14 Manual.pdf; Authorisation BK-UNITECH SOFIA.pdf; Chauvin Arnoux_AUTHORIZATION UNITECH CONTROL-NPP.pdf

BX-E-5618/10.10.2022

-----Original Message-----

From: office@unitech-bg.com <office@unitech-bg.com>
Sent: Friday, October 7, 2022 8:26 PM
To: commercial@npp.bg
Cc: Пачев, Христо Б. <HPatchev@npp.bg>; Office <office@unitech-bg.com>
Subject: Пазарна консултация №5039 - „Доставка на измервателни прибори”, Обособена позиция № 1 – „Токови клещи, тестери, мултимери, фазоуказатели, детектори и др. с общо предназначение”

Уважаеми Колеги,

Във връзка с Пазарна консултация №5039 - „Доставка на измервателни прибори” приложено изпращам:

1. Оферта по Обособена позиция № 1 – „Токови клещи, тестери, мултимери, фазоуказатели, детектори и др. с общо предназначение”.
2. Техническа информация за предложените уреди.
3. Оторизационни документи от производителя.

Best regards,

Angel Angelov
mobile: +359 88 962 7432
mail: angelov@unitech-bg.com
www.unitech-bg.com
48 "General Yosif V. Gurko" Str.
1000 Sofia Center, Bulgaria

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C.A 732
C.A 703
C.A 702

**CONTACT-FREE AC VOLTAGE
DETECTOR **C.A 732****

TORCH FUNCTION

- Phase/neutral identification
- IEC 61010 1000 V Cat III
- Double insulation



BUILT-IN TORCH:

lets you test your outlets and cables... even with poor lighting, and locate an electrical panel and any open circuit-breakers in the dark!

ULTRA-SIMPLE TO USE
The tip of the instrument lights in the presence of 230 V, 50/60 Hz AC
DESIGNED FOR CONVENIENCE

With its pen shape and clip, you can keep it in a pocket, ready for use at all times. In addition, the moulded body provides an outstandingly firm and comfortable grip.



**POCKET DIGITAL MULTIMETERS
C.A 702 and **C.A 703****

CONTACT-FREE VOLTAGE DETECTION

- AC and DC voltages
- Resistance
- Continuity and diode tests
- Current (C.A 703)
- IEC 61010 600 V CAT IV

TORCH FUNCTION



SAFETY IN ALL SITUATIONS

Thanks to their small size and built-in probe tips, you can take them with you everywhere.

**Safety in all situations
for a diagnostic tool
that is always available.**

IEC 61010
600 V CAT IV / 1000 V CAT III



CHARACTERISTICS

	C.A 702	C.A 703
V DC / precision	200 mV / ±0.5 % L + 3 D 2.000 V; 20.00 V; 200.0 V; 600 V / ±1.2 % L + 3 D > 600 V / outside specification	
V AC / precision (40-400 Hz)	2.000 V; 20.00 V / ±1.0 % L + 8 D 200.0 V; 600 V / ±2.3 % L + 10 D > 600 V / outside specification	
I DC / precision		200.0 µA; 2000 µA / ±2.0% L + 8 D 20.00 mA; 200.0 mA / ±2.0% L + 8 D 200 mA / 500 V electronic fuse
Protection		
I AC / precision		200.0 µA; 2000 µA / ±2.5% L + 10 D 20.00 mA; 200.0 mA / ±2.5% L + 10 D 200 mA / 500 V electronic fuse
Protection		
Resistance / precision	200.0 Ω / ±0.8 % L + 5 D 2.000 kΩ. 20.00 kΩ. 200.0 kΩ / ±1.2 % L + 5 D 2.000 MΩ / ±5.0 % L + 5 D 20.00 MΩ / ±10.0 % L + 5 D 600 V rms	
Protection		
Diode test	1.999 V	
Test alarm	$V_{Test} \leq 1.5 V$ $I_{Test} \leq 1.5 A$	
Protection	600 V rms	
Continuity sound test	199.9 Ω	
Buzzer	$R < \text{approx. } 60 \Omega$	
Protection	600 V rms	



- **C.A 702 and C.A 703** (104 x 55 x 32.5 mm - 145 g): supplied in blister pack with 2 cords with probe tips, 2 x 1.5 V AAA batteries, and operating manual.

To order:

- **C.A 702** P01191739Z
- **C.A 703** P01191740Z
- **C.A 732** P01191745Z
- **200 x 100 x 40 carrying case** P01298065Z



- **C.A 732**
(176 x 26 mm - 48 g): supplied in blister pack with 2 x 1.5 V AAA batteries and operating manual.

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D 45
Detector

Notice de fonctionnement
User's manual
Bedienungsanleitung
Libreto d'istruzioni
Manual de instrucciones



190, rue Championnet
F - 75018 - PARIS
Tél. 33 (0)1.44.85.44.85
Fax 33 (0)1.46.27.73.89
http://www.chauvin-arnoux.com

691345A00 - Ed. 01 - 03/04

English

Thank you for purchasing a detector for live electrical wiring, piping and metal and wood studs in wood and plywood walls.

1. GENERAL INSTRUCTIONS

Please read the following safety instructions before using this device. To avoid electrical shocks, burns or accident to the body, you must read the safety warning messages.

It is imperative to follow the instructions preceded

by the following symbol . This device operates on plywood and wood walls by plaster and reinforced concrete walls.

1.1 Precautions during use

It is recommended to check each measurement with a second test measurement. The device detects elements that are located less than 30 cm deep in the wall. Do not dismantle the casing ; only the battery compartment can be opened.

1.2 To work safely

 : applies to the whole of this section. Never bring this device in direct contact with live electrical conductor parts. This device is not a voltage selector. Be particularly careful with electrical wires and apply the Safety Regulation measures (wear insulated glove, etc.).

1.3 Guarantee

This equipment is guaranteed against any material defect or manufacturing faults, in conformity with the general conditions of sale. During this period, the manufacturer only may repair this instrument. He reserves the right to carry out repair or replacement of all or part of the equipment. If the equipment is returned to the manufacturer, forward transport is at the expense of the customer.

1.4 Low battery indication

Replace the battery when the «LowBat» LED stays lit during measurement.

1.5 Changing the batteries

The instrument is supplied with a 12 V battery (or the equivalent). To replace it, remove the battery compartment lid, replace battery and then put the lid back into place.

2. FUNCTIONAL DESCRIPTION

- (See fig. below).
Caption :
- ① Battery compartment lid
 - ② «ON» key
 - ③ Metallic/wood studs indicator (red)
 - ④ Metal indicator (red)
 - ⑤ «ON» indicator
 - ⑥ Low battery indicator
 - ⑦ Voltage indicator (blinks green, then red)
 - ⑧ Function switch

2.1 Commissioning the tester

1. Open the battery compartment (see §.1.5).
2. Remove the plastic from the compartment battery
3. Keep this plastic for when you do not use the instrumentfor more than one week. This plastic insulates the battery's and protects its charge life.

2.2 Seeking out live wires (VAC > 70 VAC)

-  : applies to the whole of this section.
1. Set the switch to «Voltage» position.
 2. Apply the device to the wall perpendicularly in an area free of live electrical conductors.
 3. Press the «ON» button to calibrate the instrument. The LowBat, Volts, LEDs as well as the center green LED lights up. The «Volts» and «LowBat» LEDs go off once the instrument is calibrated.
 4. Move the instrument horizontally and then from top to bottom. The buzzer sounds and the «Volts» LED lights up green when approaching a live wire. The closer the instrument gets to the live cable, the faster the buzzer sounds and the LED flashes.
 5. When the instrument is on the top of a live wire, the LED lights up red and the buzzer sounds continuously.
 6. Validate the measurement by repeating the operation.

Note 1 : During calibration, only the «Volts» and «ON» LEDs light up.

Note 2 : Calibration can last a few seconds to about 30 seconds.

Francais

Vous venez d'acquérir un détecteur de câbles électriques sous tension, de tuyaux et de montants métalliques ou bois dans des murs en contreplaqué ou en bois. Nous vous remercions de votre confiance.

1. INSTRUCTIONS GENERALES

Lisez les instructions de sécurité suivantes avant d'utiliser l'appareil et reportez-vous aux messages de sécurité, afin d'éviter les accidents corporels tels que les brûlures et chocs électriques. Suivez impérativement les indications précédées du symbole . Cet appareil fonctionne sur des murs en contreplaqué ou en bois. Le fonctionnement de l'instrument est altéré sur des murs en béton armé ou en plâtre.

1.1 Précautions d'emploi

Il est recommandé de valider toute mesure par une seconde mesure de contrôle. L'appareil ne détecte la tension que sur les câbles non blindés et que sur les éléments qui sont à moins de 30 cm de profondeur dans le mur. Ne démontez pas le boîtier, seule la trappe à pile peut être ouverte.

1.2 Pour travailler en sécurité

-  Ce pictogramme est applicable à tout le §.
- Ne portez jamais cet appareil au contact direct de parties électriques conductrices sous tension. Cet appareil n'est pas un détecteur de tension. Soyez particulièrement vigilant en présence de câbles électriques et appliquez les consignes réglementaires de sécurité (port de gants isolants...).

1.3 Garantie

Ce matériel est garanti contre tout défaut de matière ou vice de fabrication, conformément aux conditions générales de vente. Durant la période de garantie, l'appareil ne peut être réparé que par le constructeur, celui-ci se réservant la décision de procéder soit à la réparation, soit à l'échange de tout ou partie de l'appareil. En cas de retour du matériel au constructeur, le transport aller est à la charge du client.

1.4 Indications d'usure de la pile

Remplacez la pile lorsque la LED «LowBat» reste allumée durant la mesure.

2.3 Seeking out metal pipes

-  : applies to the whole of this section.
1. Set the switch to «Metal» position.
 2. Apply the device to the wall in an area free of metallic elements or wood beams.
 3. Press the «ON» button to calibrate the instrument. The «Stud» LED goes off once the instrument is calibrated. Release the «ON» button.
 4. Displace the instrument horizontally, then from top to bottom. The buzzer sounds and the «Stud» LED lights up red when approaching a wooden or metallic stud.
 5. Validate the measurement by repeating the operation.

2.4 Seeking out studs (wood or metal)

1. Set the switch to the «Stud» position.
2. Apply the base of the device to the wall in an area free of metallic elements or wood beams.
3. Press the «ON» button to calibrate the instrument. The «Stud» LED goes off once the instrument is calibrated. Release the «ON» button.
4. Displace the instrument horizontally, then from top to bottom. The buzzer sounds and the «Stud» LED lights up red when approaching a wooden or metallic stud.
5. Validate the measurement by repeating the operation.

1.5 Remplacement de la pile

L'appareil est équipé d'une pile 12 V. Pour la remplacer, retirez le couvercle, insérez la pile, puis remettez le couvercle.

2. DESCRIPTION FONCTIONNELLE

- (Voir illustartion).
Légende :
- ① Couvercle boîtier pile
 - ② Touche «ON»
 - ③ Indicateur montants métalliques/bois (rouge)
 - ④ Indicateur métal (rouge)
 - ⑤ Indicateur «ON»
 - ⑥ Indicateur pile faible
 - ⑦ Indicateur tension (vert clignotant, puis rouge)
 - ⑧ Commutateur de fonction

2.1 Mise en service du détecteur

1. Ouvrez le compartiment pile (voir §.1.5).
2. Retirez le film plastique du compartiment pile.
3. Conservez ce film plastique pour le réinstaller en fin d'utilisation, si vous n'utilisez pas le détecteur pendant plus d'une semaine. Ce film permet d'isoler la pile afin d'assurer son autonomie.

2.2 Recherche de câbles sous tension (VAC>70VAC)

-  Ce pictogramme est applicable à tout le §.
1. Mettez le commutateur sur la position «Voltage».
 2. Appliquez le détecteur perpendiculairement au mur dans une zone sans conducteurs électriques sous tension.
 3. Appuyez sur le bouton «ON» pour calibrer l'appareil. Les LEDs «LowBat», «Volts» ainsi que la LED «ON» s'allument. Les LEDs «Volts» et «LowBat» s'éteignent une fois l'appareil calibré.
 4. Déplacez l'appareil horizontalement, puis de haut en bas. Le buzzer sonne et la LED «Voltage» clignote en vert à l'approche d'un câble sous tension. Plus l'appareil est prêt du câble sous tension, plus la LED clignote et le buzzer sonne.
 5. Lorsque l'appareil est en regard du câble sous tension, la LED s'allume en rouge de manière fixe et le buzzer sonne de façon continue.
 6. Validez la mesure en renouvelant l'opération.

Note 1 : Lors de la calibration, seules les LEDs «Volts» et «ON» peuvent s'allumer.

Note 2 : La calibration peut durer de quelques secondes à environ 30 s.



2.3 Recherche de tuyaux métalliques

-  Ce pictogramme est applicable à tout le §.
1. Mettez le commutateur sur la position «Metal».
 2. Appliquez le détecteur perpendiculairement au mur dans une zone sans éléments métalliques.
 3. Appuyez sur le bouton «ON» pour calibrer l'appareil. La LED «Metal» s'éteint une fois l'appareil calibré. Vous pouvez relâcher le bouton «ON».
 4. Déplacez l'appareil horizontalement, puis de haut en bas. Le buzzer sonne et la LED «Metal» s'allume en rouge à l'approche d'un tuyau métallique.
 5. Validez la mesure en renouvelant l'opération.

2.4 Recherche de montants (bois ou métal)

1. Mettez le commutateur sur la position «Stud».
2. Appliquez la base du détecteur sur le mur sans éléments métalliques ou poutres en bois.
3. Appuyez sur le bouton «ON» pour calibrer l'appareil. La LED «Stud» s'éteint une fois l'appareil calibré. Vous pouvez relâcher le bouton «ON».
4. Déplacez l'appareil horizontalement, puis de haut en bas. Le buzzer sonne et la LED «Stud» s'allume en rouge à l'approche d'un montant en bois ou métallique.
5. Validez la mesure en renouvelant l'opération.



Deutsch

Wir bedanken uns für den Kauf dieses Suchgerätes, mit dem Sie versteckte, Spannung führende Leitungen, Metallrohre oder Streben aus Metall oder Holz in Wänden aus Holz oder Sperrholz auffinden können.

1. ALLGEMEINE HINWEISE

Lesen Sie bitte aufmerksam die Sicherheits-hinweise vor Benutzung des Geräts und halten Sie sich daran, um Verletzungen wie z.B. Verbrennungen oder Stromschläge zu vermeiden.

 : Hinweise unbedingt befolgen !
Dieses Gerät ist für die Benutzung an Wänden aus Holz vorgesehen. Bei Wänden aus Stahlbeton, Mauerwerk oder Gips ist die Funktion des Suchgeräts nicht zuverlässig.

- 1.1 Empfehlungen für die Benutzung**
Jede Messung sollte durch eine zweite Messung kontrolliert werden. Spannung führende Leitungen können nur gefunden werden, wenn sie nicht geschirmt sind. Versteckte Leitungen und Rohre usw.. werden nur gefunden, wenn sie weniger als 30 cm tief in der Wand liegen. Versuchen Sie niemals das Gehäuse zu öffnen. Nur das Batteriefach ist für den Benutzer zugänglich.

1.2 Sicherheitshinweise

 Dieses Symbol gilt für den gesamten Absatz. Berühren Sie mit diesem Gerät niemals elektrisch leitende Teile, die unter Spannung stehen. Das Gerät ist kein Spannungsprüfer. Seien Sie besonders vorsichtig, wenn Sie in der Nähe von elektrischen Leitungen arbeiten und halten Sie die entsprechenden Sicherheitsvorschriften ein (z.B. Tragen von isolierenden Handschuhen, usw...).

1.3 Garantie

Wir gewähren für das Gerät eine Garantie gegen Herstellungs- oder Werkstoffmängel entsprech. unseren allgemeinen Verkaufsbedingungen. Während der Garantiezeit darf das Gerät ausschließlich vom Hersteller instandgesetzt werden. Dabei behält sich dieser das Recht vor, es zu reparieren oder ganz oder teilweise auszuwechseln. Für die Rücksendung des Geräts an den Hersteller trägt der Käufer die Versandkosten.

1.4 Ersetzen der Batterie

Das Gerät ist mit einer 12 V-Batterie ausgerüstet. Zum Ersetzen der Batterie das Batteriefach öffnen, die Batterie einsetzen und den Fachdeckel wieder schließen.

1.5 Anzeige des Batteriezustands
Wenn die LED «LowBat» während einer Messung ständig aufleuchtet, muss die Batterie ersetzt werden.

- 2. FUNKTIONSBESCHREIBUNG**
(Siehe Abb.).
Beschreibung :
- ① Batterie Fachdeckel
 - ② Taste «ON»
 - ③ LED für Streben-Anzeige (rot)
 - ④ LED für Metallanzeige (rot)
 - ⑤ Anzeige «ON»
 - ⑥ Batterie schwach
 - ⑦ Led für Spannungsanzeige (blinkt grün, dannach rot)
 - ⑧ Funktions-Umschalter

2.1 Inbetriebnahme des Suchgeräts

1. Öffnen Sie das Batteriefach (siehe §. 1.5).
2. Entfernen Sie die Plastikfolie von den Kontakten.
3. Bewahren Sie die Plastikfolie auf, um sie wieder einsetzen zu können, wenn Sie das Gerät für mehr als 1 Woche nicht benutzen. Sie verlängern so die Betriebsdauer der Batterie.

2.2 Aufsuchen von Wechselspannung führenden Leitungen (Spannung > 70 VAC)

-  Dieses Symbol gilt für den gesamten Absatz.
1. Bringen Sie den Umschalter in Stellung «Voltage».
 2. Setzen Sie das Suchgerät senkrecht auf die Wand an einer Stelle, wo mit Sicherheit keine Stromkabel verlaufen.
 3. Drücken Sie die Taste «ON», um das Gerät zu kalibrieren. Die LEDs «LowBat», «Volts» sowie die LED «On» leuchten auf. Wenn sich das Gerät für die betreffende Wand kalibriert hat, verlöschen die LEDs «Volts» und «LowBat».
 4. Fahren Sie nun mit dem Suchgerät die Wand ab, zuerst waagrecht, dann senkrecht. Wenn ein Spannung führendes Kabel gefunden wird, ertönt der Summer und die LED «Volts» blinkt grün. Je näher Sie dem Kabel kommen, umso schneller blinkt die LED und umso häufiger ertönt der Summton.

5. Wenn das Gerät direkt über dem Spannung führenden Kabel steht, leuchtet die LED ständig rot und der Summton ertönt ständig.
6. Markieren Sie die Stelle und führen sie zur Kontrolle eine zweite Messung durch.

Hinweis 1: Bei der Kalibrierung können auch nur die beiden LEDs «Volts» und «On» aufleuchten.
Hinweis 2: Die Kalibrierung auf den Wandtyp kann von wenigen Sekunden bis zu 30 s dauern.

2.3 Aufsuchen von Metallrohren

-  Dieses Symbol gilt für den gesamten Absatz.
1. Bringen Sie den Umschalter in Stellung «Metal».
 2. Setzen Sie das Suchgerät senkrecht auf die Wand an einer Stelle, wo mit Sicherheit keine Metallrohre verlaufen.
 3. Drücken Sie die Taste «ON», um das Gerät zu kalibrieren. Nachdem sich das Gerät für die betreffende Wand kalibriert hat, verlöscht die LED «Metal». Sie können nun die Taste «ON» loslassen.
 4. Fahren Sie zuerst waagrecht dann senkrecht über die Wand, um das Rohr zu suchen. Beim Auffinden eines Metallrohrs leuchtet die LED «Metal» rot und der Summer ertönt.
 5. Markieren Sie die Stelle und führen sie zur Kontrolle eine zweite Messung durch.

2.4 Aufsuchen von Holz- oder Metall-Streben (= Streben).

2. Setzen Sie das Suchgerät senkrecht auf die Wand an einer Stelle, wo mit Sicherheit keine Streben oder Balken aus Metall oder Holz verlaufen.
3. Drücken Sie die Taste «ON», um das Gerät zu kalibrieren. Nachdem sich das Gerät für die betreffende Wand kalibriert hat, verlöscht die LED «Stud». Sie können nun die Taste «ON» loslassen.
4. Fahren Sie zuerst waagrecht dann senkrecht über die Wand, um die Strebe zu suchen. Beim Auffinden einer Strebe aus Holz oder Metall leuchtet die LED «Stud» rot und der Summer ertönt.
5. Markieren Sie die Stelle und führen sie zur Kontrolle eine zweite Messung durch.

Usted acaba de adquirir un detector de cables eléctricos baja tensión, de tubos y de montantes metálicos o madera en paredes de contrachapado o de madera y le agradecemos su confianza.

1. INSTRUCCIONES GENERALES

Lea las instrucciones de seguridad siguientes antes de utilizar el aparato y remítase a los mensajes de seguridad, para evitar accidentes corporales tales como quemaduras y choques eléctricos. Siga imperativamente las indicaciones precedidas

del símbolo .

Este aparato funciona sobre paredes de contrachapado o de madera. El funcionamiento se puede alterar sobre paredes de hormigón armado o de yeso.

1.1 Precauciones de uso

Se recomienda validar toda medida mediante una segunda medida de control.

El aparato sólo detecta la tensión sobre los cables no blindados y sobre los elementos que se encuentran al menos de 30 cm de profundidad en la pared.

No desmonte la caja, solamente se debe abrir la lengüeta del alojamiento para pila.

1.2 Para trabajar en total seguridad

 Este pictograma se aplica a todo el §.

Nunca ponga este aparato en contacto directo con las partes eléctricas conductoras bajo tensión, ya que no es un detector de tensión. Manténgase particularmente vigilante en presencia de cables eléctricos y aplique las consignas reglamentarias de seguridad (usar guantes aislantes, etc.).

1.3 Garantía

Este material está garantizado contra todo defecto de material o vicio de fabricación, de conformidad con las condiciones generales de venta. Durante el periodo de garantía, el aparato puede ser reparado únicamente por el fabricante, éste se reserva la decisión de proceder ya sea a la reparación o al cambio de todo o parte del aparato. En caso de devolución del material al fabricante, el transporte de ida estará a cargo del cliente.

1.4 Indicaciones de desgaste de pila

Reemplace la pila cuando permanece encendido el LED «LowBat» durante la medida.

Hai appena acquistato un rilevatore di cavi elettrici in tensione, di tubi e di montanti metallici o di legno in muri in compensato o in legno. Te ne ringraziamo.

1. ISTRUZIONI GENERALI

Leggi le seguenti istruzioni di sicurezza prima di utilizzare l'apparecchio e fai riferimento ai messaggi di sicurezza, per evitare eventuali incidenti corporei quali le bruciature e gli shock elettrici.

Segui imperativamente le indicazioni precedute

dal simbolo .

Il presente apparecchio funziona su muri in compensato o in legno. Il funzionamento dello strumento è alterato con muri in cemento armato o in gesso.

1.1 Precauzioni d'uso

Si raccomanda di convalidare una qualsiasi eventuale misura con una seconda misura di controllo.

L'apparecchio rileva la tensione solo su cavi non blindati e su elementi che sono a meno di 30 cm di profondità nel muro.

Non smontare la scatola, solo il vano pile può essere aperto.

1.2 Per lavorare in totale sicurezza

 : pittogramma applicabile a tutto il §.

Non mettere mai il presente apparecchio in contatto diretto con le parti elettriche conduttrici in tensione.

Non è un rilevatore di tensione. Sii molto attento in presenza di cavi elettrici ed applica le raccomandazioni regolamentari di sicurezza (porta guanti isolanti, ...).

1.3 Garanzia

Il presente materiale è garantito contro qualsiasi eventuale difetto di materiale o vizio di fabbricazione, conformemente alle condizioni generali di vendita. Durante il periodo di garanzia, l'apparecchio può essere riparato solo dal fabbricante, questi si riserva il diritto di decidere se procedere alla riparazione, o alla sostituzione totale o parziale dell'apparecchio. In caso di ritorno del materiale al costruttore, il costo della spedizione d'andata è a carico del cliente.

1.5 Reemplazo de la pila

El aparato consta de una pila de 12 V. Para reemplazarla, retire la tapa, inserte la pila y vuelva a colocar la tapa.

2. DESCRIPCION FUNCIONAL

(Véase fig.).

Legenda :

- ① Compartimento para pila
- ② Botón «ON»
- ③ LED montantes madera o metal (rojo)
- ④ LED metal (rojo)
- ⑤ LED «ON»
- ⑥ LED de desgaste de pila
- ⑦ LED tensión (verde intermitente, luego rojo)
- ⑧ Mando selector

2.1 Puesta en servicio del detector

1. Abra el compartimento para pila (véase §.1.5).
2. Retire la película plástica del compartimento para pila.
3. Conserve esta película plástica para volverla a insertar al final de la utilización, si no utiliza el detector durante más de una semana. Esta película permite aislar la pila para asegurar su autonomía.

2.2 Búsqueda de cables bajo tensión (V_{CA}>70V_{CA})

 Este pictograma se aplica a todo el §.

1. Coloque el selector en la posición «Voltage».
2. Aplique el detector perpendicularmente a la pared en una zona sin conductores eléctricos bajo tensión.
3. Pulse el botón «ON» para calibrar el aparato. Se encienden los LEDs «LowBat», «Volts», así como el LED «ON». Los LEDs «Volts» y «LowBat» se apagan una vez que se ha calibrado el aparato.
4. Desplace el aparato horizontalmente y luego de arriba hacia abajo. El zumbador suena y el LED «Volts» parpadea en verde al acercarse de un cable bajo tensión. Mientras más cerca está el aparato del cable bajo tensión, el LED parpadea más y el zumbador suena.
5. Cuando el aparato se encuentra en frente del cable bajo tensión, el LED se enciende en rojo y permanece fijo y el zumbador suena de forma continua.
6. Valide la medida renovando la operación.

Nota 1 : Durante la puesta de calibrado, solamente se pueden encender los LEDs «Volts» y «ON».

Nota 2 : El calibrado puede durar de algunos segundos a 30 s.

1.4 Indicazioni d'usura della pila

Sostituisci la pila quando il LED «LowBat» rimane acceso durante la fase di misura.

1.5 Sostituzione della pila

L'apparecchio è dotato di una pila 12 V. Per sostituirla, apri il coperchio, inserisci la pila, poi rimetti il coperchio.

2. DESCRIZIONE FUNZIONALE (Vedi fig.).

Didascalia :

- ① Scomparto pila
- ② Pulsante «ON»
- ③ LED montanti legno o metallo (rosso)
- ④ LED metallo (rosso)
- ⑤ LED «ON»
- ⑥ LED d'usura della pila
- ⑦ LED tensione (verde intermittente, poi rosso)
- ⑧ Commutatore

2.1 Messa in servizio del rilevatore

1. Apri lo scomparto pila (vedi §.1.5).
2. Togli il film di plastica dello scomparto pila.
3. Conserva il film di plastica per riposizionarlo alla fine dell'utilizzazione, se non utilizzi il rilevatore per più di una settimana. Questo film permette di isolare la pila e di assicurarne l'autonomia.

2.2 Ricerca di cavi in tensione (V_{AC} > 70 V_{AC})

 : pittogramma applicabile a tutto il §.

1. Metti il commutatore in posizione «Voltage».
2. Applica il rilevatore perpendicolarmente al muro in una zona senza conduttori elettrici in tensione.
3. Premi sul pulsante «ON» per calibrare l'apparecchio. I LED «LowBat», «Volts» ed anche il LED «On» si accendono. I LED «Volts» e «LowBat» si spengono dopo che l'apparecchio è stato calibrato.
4. Sposta l'apparecchio orizzontalmente, poi dall'alto verso il basso. Il buzzer suona ed il LED «Voltage» lampeggia in verde all'avvicinarsi di un cavo in tensione. Più l'apparecchio è vicino al cavo in tensione, e più il LED lampeggia ed il buzzer squilla.
5. Quando l'apparecchio è al livello del cavo in tensione, il LED si accende in rosso in modo fisso ed il buzzer suona in modo continuo.
6. Convalida la misura ripetendo l'operazione.

Nota 1 : Al momento della calibrazione, solo i LED «Volts» e «ON» possono accendersi.

Nota 2 : La calibrazione può durare da qualche secondo a circa 30 s.

2.3 Búsqueda de tubos metálicos

 Este pictograma se aplica a todo el §.

1. Coloque el interruptor en la posición «Metal»
2. Aplique el detector perpendicularmente a la pared en una zona sin elementos metálicos
3. Pulse el botón «ON» para calibrar el aparato. El LED «Metal» se apaga una vez que se ha calibrado el aparato y puede soltar el botón «Press On».
4. Desplace el aparato horizontalmente y luego de arriba hacia abajo. El zumbador suena y el LED «Metal» se enciende en rojo al acercarse de un tubo metálico.
5. Valide la medida renovando la operación.

2.4 Búsqueda de montantes (madera o metal)

1. Coloque el interruptor en la posición «Stud».
2. Aplique la base del detector sobre la pared sin elementos metálicos o vigas de madera.
3. Pulse el botón «ON» para calibrar el aparato. El LED «Stud» se apaga una vez que se ha calibrado el aparato y puede soltar el botón «ON».
4. Desplace el aparato horizontalmente y luego de arriba hacia abajo. El zumbador suena y el LED «Stud» se enciende en rojo al acercarse de un montante de madera o metálico.
5. Valide la medida renovando la operación.

2.3 Ricerca di tubi metallici

 : pittogramma applicabile a tutto il §.

1. Metti il commutatore in posizione «Metal»
2. Applica il rilevatore perpendicolarmente al muro in una zona senza elementi metallici
3. Premi sul pulsante «ON» per calibrare l'apparecchio. Il LED «Metal» si spegne dopo che l'apparecchio è stato calibrato. Puoi lasciare il pulsante «ON».
4. Sposta l'apparecchio orizzontalmente, poi dall'alto verso il basso. Il buzzer suona ed il LED «Metal» si accende in rosso all'avvicinarsi di un tubo metallico.
5. Convalida la misura ripetendo l'operazione.

2.4 Ricerca di montanti (legno o metallo)

1. Metti il commutatore sulla posizione «Stud».
2. Applica la base del rilevatore sul muro senza elementi metallici o travi di legno.
3. Premi sul pulsante «ON» per calibrare l'apparecchio. Il LED «Stud» si spegne dopo che l'apparecchio è stato calibrato. Puoi lasciare il pulsante «ON».
4. Sposta l'apparecchio orizzontalmente, poi dall'alto verso il basso. Il buzzer suona ed il LED «Stud» si accende in rosso all'avvicinarsi di un montante di legno o di metallo
5. Convalida la misura ripetendo l'operazione.



Multimetrix®

DMM 210 / DMM 220 / DMM 230 / DMM 240 Industrial digital multimeters



- 600 V CAT IV / 1000 V CAT III
- Water- and dust-tight (IP 67)
- Built-in moulded shockproof sheath
- Large backlit display unit with bargraph
- High-resolution 6,000- and 40,000-count models

CE

Multimetrix®

Specifications :



		DMM 210	DMM 220	DMM 230	DMM 240
Display		6,000 counts Backlit with bargraph			40,000 counts Backlit with bargraph
Measurement type		Average		TRMS	TRMS
Bandwidth		40 Hz to 1 kHz			50 Hz to 1 kHz
I _{DC}	Ranges	600 µA / 6000 µA / 60 mA / 600 mA / 6 A / 10 A			400 µA / 4000 µA / 40 mA / 400 mA / 10 A (20 A max.)
	Basic accuracy	1.0 % + 3 counts			1.0 % + 3 counts
	Best resolution	0.1 µA			0.01 µA
	4-20 mA	—			-25 % to 125 %
I _{AC}	Ranges	600 µA / 6000 µA / 60 mA / 600 mA / 6 A / 10 A (20 A max.)			400 µA / 4000 µA / 40 mA / 400 mA / 10 A (20 A max.)
	Basic accuracy	1.5 % + 3 counts			1.5 % + 3 counts
	Best resolution	0.1 µA			0.1 µA
V _{DC}	Ranges	600 mV / 6 V / 60 V / 600 V / 1000 V			400 mV / 4 V / 40 V / 400 V / 1000 V
	Basic accuracy	0.09 % + 2 counts			0.06 % + 2 counts
	Best resolution	0.1 mV			0.01 mV
V _{AC}	Ranges	6 V / 60 V / 600 V / 1000 V			400 mV / 4 V / 40 V / 400 V / 1000 V
	Basic accuracy	1.0 % + 3 counts			1.0 % + 3 counts
	Best resolution	1 mV			0.1 mV
Resistance	Ranges	600 Ω / 6 kΩ / 60 kΩ / 600 kΩ / 6 MΩ / 60 MΩ			400 Ω / 4 kΩ / 40 kΩ / 400 kΩ / 4 MΩ / 40 MΩ
	Basic accuracy	0.3 % + 4 counts			0.3 % + 4 counts
	Best resolution	0.1 Ω			0.01 Ω
Audible continuity		Yes / 0.1 Ω			Yes / 0.1 Ω
Diode test		Yes			Yes
Capacitance		—	0.01 nF to 1000 µF		0.001 nF to 40 mF
Temperature (K thermocouple)		—	– 45 °C to +750 °C		– 50 °C to +1000 °C
Frequency	Electrical	10.00 to 400.00 Hz			40.00 to 400.00 Hz
	Electronic	0.001 Hz to 10.00 MHz			0.001 Hz to 100.00 MHz
Duty cycle		0.1 to 99.9 %			0.1 to 99.90 %
Calibre selection		Autorange / Manual			
Other features		Automatic shutdown (deactivatable) Relative mode – MIN, MAX			Automatic shutdown (deactivatable) Relative mode – MIN, MAX, PEAK (1 ms)
Ingress protection		IP 67			
Safety		600 V Cat. IV / 1000 V Cat. III according to IEC 61010-1, IEC 61010-2-033			
Dimensions / weight		187 x 81 x 50 mm / 342 g approx.			
Accessories supplied		9 V battery, 1 set of red/black test-probe	9 V battery, 1 set of red/black test-probe + type K temperature probe		

TO ORDER

Reference	P06231410	P06231411	P06231412	P06231413
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MW 3350, 3355, 3360, 3365, 3380, 3390, 3395

A NEW DESIGN TO PROVIDE MORE SAFETY FOR ALL YOUR NEEDS.

Safety, Accuracy, Easy to use

Thanks to the new design of safety, the new SEFRAM clamp on multimeter will answer to all your problems.

- New Slim design : ergonomically designed slim shape with one hand operated knob and button. Just fit the palm of your hand your needs.
- Safety : IEC 1010 cat IV 600 V for the model MW 3380, MW 3390 and MW 3395.
- Full jaw
- Maximum opening jaw up to 53 mm
- Up to 1500 A measurements for MW3390 / MW3395
- TRMS AC measurements for MW 3355, MW3365 and MW 3395



**MW 3395
MW 3390
MW 3380**



**MW 3360
MW 3365**



**MW 3350
MW 3355**

TRMS AC

TRMS AC

TRMS AC

Performances	MW 3350	MW 3355	MW 3360	MW 3365	MW 3380	MW 3390	MW 3395
Opening jaw	37 mm	37 mm	45 mm	45 mm	53 mm	53 mm	53 mm
Display with backlight	4000 Counts	4000 Counts	4000 Counts	4000 Counts	4000 Counts	4000 Counts	4000Counts
I max. AC	600 A	600 A	600 A	600 A	1000 A	1500 A	1500 A
I max. DC	-	-	600 A	600 A	-	1500 A	1500 A
V max. AC	600 V	600 V	600 V	600 V	750 V	750 V	750 V
V max. DC	600 V	600 V	600 V	600 V	1000 V	1000 V	1000 V
Resistance	yes	yes	yes	yes	yes	yes	yes
Buzzer	yes	yes	yes	yes	yes	yes	yes
Frequencemeter	yes	yes	yes	yes	yes	yes	yes
HOLD, MIN, MAX, PEAK HOLD	yes	yes	yes	yes	yes	yes	yes
Auto power off	yes	yes	yes	yes	yes	yes	yes
Safety	CAT III 600 V CAT II 1000 V	CAT III 600 V CAT II 1000 V	CAT III 600 V CAT II 1000 V	CAT III 600 V CAT II 1000 V	CAT IV 600 V CAT III 1000 V	CAT IV 600 V CAT III 1000 V	CAT IV 600 V CAT III 1000 V



MW 3350, 3355, 3360, 3365, 3380, 3390, 3395

Clamp on meters

Technical specifications	MW 3350 MW 3355	MW 3360 MW 3365	MW 3380	MW 3390 MW 3395
IAC	400 A / 600 A	400 A / 600 A	400 A / 1000 A	400 A / 1500 A
Accuracy	± (1,9% + 5d)	± (1,9% + 5d)	± (1,9% + 5d)	± (1,9% + 5d)
Resolution	100 mA	100 mA	100 mA	100 mA
Overload protection	660 A	660 A	1100 A	1500 A
IDC	-	400 A / 600 A	-	400 A / 1500 A
Accuracy	-	± (1,5% + 5d)	-	± (1,9% + 3d)
Resolution	-	100 mA	-	100 mA
Overload protection	-	660 A	-	1500 A
VAC	400 V / 600 V	400 V / 600 V	400 V / 750 V	400 V / 750 V
Accuracy	± (1% + 5d)	± (1% + 5d)	± (1% + 5d)	± (1% + 5d)
Resolution	100 mV	100 mV	100 mV	100 mV
Protection				
VDC	400 V / 600 V	400 V / 600 V	400 V / 1000 V	400 V / 1000 V
Accuracy	± (0,7% + 2d)	± (0,7% + 2d)	± (0,7% + 2d)	± (0,7% + 2d)
Resolution	100 mV	100 mV	100 mV	100 mV
Protection				
Resistance	400 Ω	400 Ω	400 Ω	400 Ω
Accuracy	± (1% + 3d)	± (1% + 3d)	± (1% + 3d)	± (1% + 3d)
Resolution	0,1 Ω	0,1 Ω	0,1 Ω	0,1 Ω
Protection				
Continuity test with buzzer	yes for R ≤ 30Ω	yes for R ≤ 30Ω	yes for R ≤ 30Ω	yes for R ≤ 30Ω
True RMS AC reading	yes for 3355	yes for 3365	-	yes for 3395
Frequency counter	4KHz/10KHz	4KHz/10KHz	4KHz/10KHz	4KHz/10KHz
Accuracy	± (0,1% + 2d)	± (0,1% + 2d)	± (0,1% + 2d)	± (0,1% + 2d)
Resolution	1Hz	1Hz	1Hz	1Hz

General specifications	MW 3350 MW 3355	MW 3360 MW 3365	MW 3380	MW 3390 MW 3395
Specification				
Display with backlight	4000 Counts	4000 Counts	4000 Counts	4000 Counts
Curve analogue bargraph	yes	yes	yes	yes
Opening jaw	37 mm	45 mm	53 mm	53 mm
MIN/MAX, HOLD	yes	yes	yes	yes
PEAK HOLD (10ms)	yes	yes	yes	yes
Overload indication	yes, display "OL"	yes, display "OL"	yes, display "OL"	yes, display "OL"
Low battery indication	yes with symbol	yes with symbol	yes with symbol	yes with symbol
Sampling rate	2 mes. / s.	2 mes. / s.	2 mes. / s.	2 mes. / s.
Auto power off	yes	yes	yes	yes
Operating mode				
Security CEI 1010	CAT III 600 V	CAT III 600 V	CAT IV 600 V	CAT IV 600 V
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C	0° to 50° C
Storage temperature	-20° to 60° C	-20° to 60° C	-20° to 60° C	-20° to 60° C
Temperature coefficient	0,2 x (spec.Acc'y)/° C, < 18°C or > 28° C	0,2 x (spec.Acc'y)/° C, < 18°C or > 28° C	0,2 x (spec.Acc'y)/° C, < 18°C or > 28° C	0,2 x (spec.Acc'y)/° C, < 18°C or > 28° C
Power requirement*	AAA size 1,5 V	AAA size 1,5 V	AAA size 1,5 V	AAA size 1,5 V
Battery life	300 h with alkaline battery	300 h with alkaline battery	300 h with alkaline battery	300 h with alkaline battery
Max. diameter of cable	34 mm	35 mm	51 mm	51 mm
Dimensions, weight				
Dimension	76x220x50mm	72x235x51mm	90x275x51mm	90x275x51mm
Weight (with battery)	360g	380g	420g	420g

Deliver with : One set of test leads (SA 103), carrying pouch, battery and user manual

* Alkaline Battery to be used

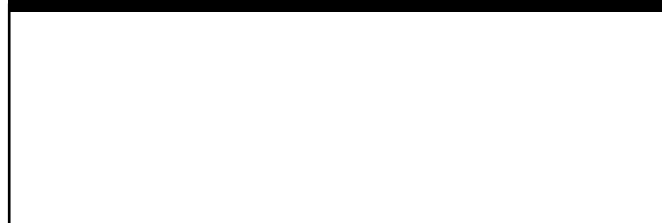


Specification subject to change without notice - FTMW3350 A/01



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Fax. +33 (0) 4.77.57.23.23
Web : www.sefram.fr - e-mail : sales@sefram.fr

Partenaire Distributeur



LCD voltage and continuity tester

Main features

- Start voltage : 6V
- Polarity indication
- Continuity test
- Single-pole phase test
- Phase rotation test
- Torch light
- Side detection for ELV and continuity
- Auto-power ON / OFF
- High resolution voltage of 0.1 V (<30 V)
- Voltage range : 1000V AC and 1500V DC
- Non-Contact Voltage detection
- RCD trip test (via 2-button activation)
- Diode test
- Voltage test with load
- Resistance measurement
- Frequency measurement
- Vibration motor for ELV

Easy to use

The new SEFRAM 66 is an easy-to-use instrument :
Direct reading of voltage and polarity on LCD backlight screen.

Robustness and efficacy

Robust, The SEFRAM 66 is a field device resilient to shocks. This tester is equipped with a torch light for measurements in dark environments. The LCD display permit without ambiguity an instantaneous evaluation of the measured voltage. The vibrator is activated and the backlight changes color when voltage is detected.

Safety

The SEFRAM 66 has been designed, tested and approved according to the EN61243-3 standard. Designed with IP2X test probes, the user will be protected in any cases, including misuse of the instrument. The SEFRAM 66 is rated : CAT III - 1000V and CAT IV - 600V. It's equipped with complete autotest enable operating verification and with a double safety information (in front and on a side).



Continuity
test

Voltage
detection

Autotest

Vibrator

RCD trip test

Specifications		SEFRAM 66
Voltage range		1V to 1000 VAC (16 à 800 Hz), 1 to 1500 VDC
Nominal voltage		6/12/24/50/120/230/400/690 V (represented shown as LCD segments)
LED Tolerances		According to EN 61243-3
ELV-Indication LED		for V>50 VAC or V>120 VDC
Response time		<1s to 100 % of each nominal value
LCD Range		1 to 1000 VAC (16 to 800 Hz), 1 to 1500 VDC
LCD Resolution		0.1 V (1 to 29.9 V), 1 V (30 to 1500 V)
LCD voltage accuracy		±3 % ±5 dgt (1 to 29.9 V) ±3 % ±3 dgt (30 to 1500 V)
Overrange indication		'OL' display
Safety current		I _s < 3.5 mA (at 1000 V)
Peak current		<3.5 mA (at 1000 V)
Measurement duty		30 s ON (operation time <690 V), 10 s ON (operation time >690 V), 240 s OFF (recovery time)
Internal battery consumption		Approx. 120 mA
Single-pole phase test voltage range		100 to 1000 VAC (50/60 Hz)
Phase rotation test		170 to 1000 V phase-to-phase, AC (40-70 Hz)
Continuity test		0 to 500 kΩ + 50 %
Resistance measurement		
Range		0 to 1999 Ω
Précision		5 % ±10 dgt at 25 °C
Resolution		1 Ω
Frequency measurement		
Range		1 to 800 Hz
Precision		±5 % ±5 dgt;
resolution		1 Hz
RCD test		30 mA at 230 V
General specifications		
Power supply		2x 1.5V IEC LR03 / AAA
Operating temperature		-15 to 55°C
Storage temperature		-20 to 70°C without condensation
Humidity		85% relative humidity max.
Altitude		Up to 2000 m
Safety / overvoltage		CAT III 1000V / CAT IV 600V
Standard		EN/IEC 61243-3:2014
Protection		IP 64
Dimensions		239 x 68 x 29 mm
Weight		235 g with batteries
Warranty		2 years

Optional accessories:

SC518: Protective bag

SC523: Belt case



SC518: Protective bag



SC523: Belt case



FT SEFRAM66 A00 - Specifications can be updated without notice

Sefram



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 Fax. +33 (0).4.77.57.23.23
 Website : www.sefram.com - e-mail : sales@sefram.com

For assistance and ordering



Network cables tester (RJ-45, RJ-11)

Characteristics

- Designed for RJ45/RJ11 modular cables, 10/100 base-T cable and Token Ring cable
- The Lan cable tester can verify cable continuity, open, short circuit and miss-wired.
- The deported receiving module is available for installed cables far away either on the wall plates or on the patch panels.
- Automatic or manual sweep mode
- Display: LED indication for wire status.
- Buzzer sound warning for wire status.
- EN61326-1
- Supplied with carrying case



SEFRAM 95

Specifications	SEFRAM 95
Types of tests	cable continuity (shielded cable included), open, short circuit and miss-wired.
Test modes	Automatic and manual
Buzzer	Sound when continuity absence
Deported module	For installed cables
Main specifications	
Display	LED
Operating Temperature	0°C to 40°C
Storage temperature	-10°C to 40°C (battery removed)
Alimentation	9V (6F22,006P) battery x1
Dimensions	132 x 55 x 39mm (main unit) 74 x 30 x 25mm (deported module)
Weight	148g (main unit) 33g (deported module)
Warranty	1 year

Supplied with: test cables, user's guide, battery



Carring case



FTSEFRAM95 A 00 - Specifications can be updated without notice



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For assistance and ordering



■ TESTEUR DE PHASE

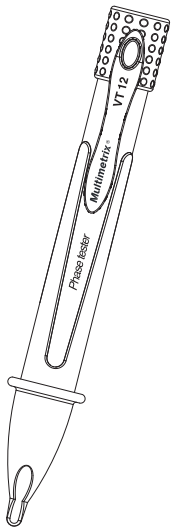
■ PHASE TESTER

■ PHASENPRÜFER

■ TESTER DI FASE

■ COMPROBADOR DE FASE

VT 12

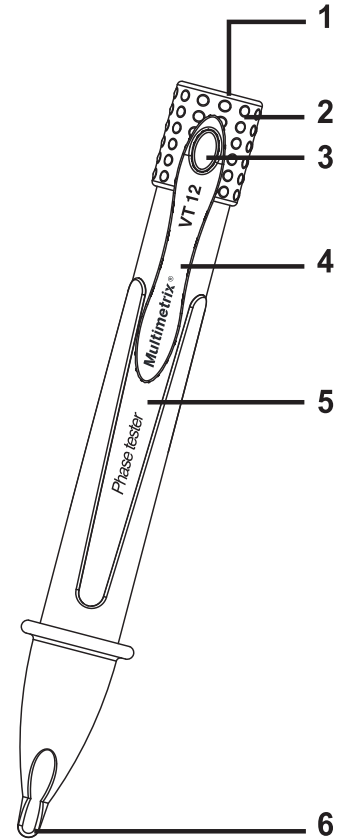


FRANCAIS
ENGLISH
ESPAÑOL
ITALIANO
DEUTSCH

Mode d'Emploi
User's Manual
Manual de Instrucciones
Libretto d'Istruzioni
Bedienungsanleitung

Multimetrix®

DESCRIPTION - DESCRIPTION
BESCHREIBUNG - DESCRIZIONE
DESCRIPCIÓN



1. Torche
Torch
Stablampe
Torcia
Torcha

FR
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I
E
2. Capuchon trappe à piles
Battery compartment cap (2x1.5V AAA)
Batteriefachdeckel (2x1.5V AAA)
Protezione sportello delle pile (2x1.5V AAA)
Capuchón tapa de pilas (2x1.5V AAA)

FR
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3. Interrupteur ON/OFF (à accrochage)
de la fonction torche
Torch function ON/OFF switch (latching)
Schalter ON /OFF (aufgehängt)
für Stablampe
Interruttore ON /OFF (da agganciare)
della funzione torcia
Interruptor ON /OFF (de enganche)
de la función torcha

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4. Bras trappe à piles
Battery compartment arm
Batteriefachgelenk
Braccio sportello delle pile
Brazo tapa de pilas

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5. Corps du testeur
Body of the tester
Prüfkörper
Corpo del tester
Cuerpo del comprobador

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6. Pointe isolée (capteur capacitif)
Isolated tip (capacitive sensor)
Isoliertspitze (kapazitive Erfassung)
Punta isolata (sensore capacitivo)
Punta aislada (sensor capacitivo)

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GB
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FRANÇAIS

Vous venez d'acquérir un VT 12 Testeur de Phase et nous vous remercions de votre confiance.
Pour obtenir le meilleur service de votre appareil :

- lisez attentivement ce mode d'emploi
- respectez les précautions d'emploi.

PRÉCAUTIONS D'EMPLOI

- Toujours tester l'appareil sur le secteur avant d'utiliser le testeur.
- Ce testeur de phase ne doit pas être considéré comme un vérificateur d'absence de tension (VAT).
- Ne pas utiliser sur une installation dont la tension est supérieure à 1000V par rapport à la terre et dont la catégorie de surtension est supérieure à III.

POUR COMMANDER

Testeur de phase VT 12 P06230202

Livré avec deux piles 1.5V AAA et ce mode d'emploi.

1. PRÉSENTATION

Le VT 12 est un testeur unipolaire de tension alternative, sans contact.
Il permet de détecter la présence d'une tension de 230VAC 50Hz/60Hz par rapport à la terre et permet ainsi de repérer visuellement la phase du neutre sur les réseaux 400V~ tri/230V~ mono.
Il possède également une fonction torche.

2. FONCTION TORCHE

Appuyez sur l'interrupteur (rep.3) pour allumer ou éteindre la «torche».

3. DÉTECTION DE TENSION
ALTERNATIVE 230V AC
REPÉRAGE DE PHASE

Toujours tester l'appareil sur le secteur avant d'utiliser le testeur.

3.1 MISE EN OEUVRE
Prendre le testeur en main et mettre la pointe isolée (rep.6) au contact de la prise secteur, du câble électrique ou de la borne à tester.
En cas de présence de tension 230VAC 50/60Hz par rapport à la terre, la pointe isolée s'allume.
La présence d'une tension de 230VAC 50/60Hz par rapport à la terre permet ainsi d'identifier la borne de phase (pointe isolée (rep.6) allumée) et la borne de neutre (pointe isolée (rep.6) éteinte).

3.2 DOMAINE D'UTILISATION SPÉCIFIÉ
■ Détection de tension, sans contact :
200V~≤U≤265V~ par rapport à la terre.
■ Fréquence : 50/60Hz ±5%
■ Tension maxi par rapport à la terre : 1000V
■ Temps de réponse : < 0,5 seconde

3.3 LIMITE DE DÉTECTION
■ Attention : Du fait du principe de fonctionnement par capteur capacitif, certaines conditions peuvent affecter la détection de phase : présence d'un champ électrique important, revêtement de sol isolant, échelle en bois, ensoleillement intense, ... blindage de câble.
La pointe isolée (rep.6) peut ainsi s'allumer sans qu'une tension réseau 230VAC 50/60Hz ne soit à proximité immédiate du capteur.

4. CARACTÉRISTIQUES GÉNÉRALES

4.1 CONDITIONS D'ENVIRONNEMENT
Conditions à respecter pour garantir le bon fonctionnement.
■ Utilisation en intérieur uniquement, sans projection d'eau conformément à l'indice de protection IP 40.
■ Température : -10... +50°C
■ Humidité relative : 0°C - 30°C : 95% HR / 30°C - 40°C : 75% / 40°C - 50°C : 45%
■ Altitude : jusqu'à 2000m

5. MAINTENANCE

Pour la maintenance, utilisez seulement les pièces de rechange qu'ont été spécifiées. Le fabricant ne pourra être tenu pour responsable de tout accident survenu suite à une réparation effectuée en dehors de son service après-vente ou des réparateurs agréés.

5.1 REMPLACEMENT DES PILES
■ Soulevez puis poussez le bras de la trappe à piles (rep.4).
■ Remplacez les deux piles 1.5V AAA (IEC LR03) défectueuses et refermez le boîtier avant utilisation.

5.2 ENTRETIEN
■ Nettoyage du boîtier avec un chiffon légèrement imbibé d'eau savonneuse. Rincez avec un chiffon humide. Ensuite séchez rapidement avec un chiffon sec ou de l'air pulsé.

5.3 STOCKAGE
Si le testeur n'est pas mis en service pendant une durée dépassant 60 jours, enlevez les piles et stockez les séparément.

5.4 ALIMENTATION
■ 2 piles 1.5V (AAA, LR03)
■ Autonomie : 2500 tests de 5 secondes.

5.5 DIMENSIONS ET MASSE
■ Dimensions : 176 x 26mm (hors tout)
■ Masse : 48g (avec pile)

5.6 CONFORMITÉ AUX NORMES
■ Sécurité électrique (selon IEC 61010-1)
- Double isolation
- Catégorie d'installation III
- Degré de pollution 2
- Tension assignée : 1000V
■ Étanchéité (selon NF EN 60529) : indice de protection IP 40.
■ Compatibilité électromagnétique : (selon EN 50081-1 et EN 50082-1) : marquage CE.

5.7 RÉPARATION
■ Réparation sous garantie et hors garantie
Adressez vos appareils à l'une des agences régionales MANUMESURE, agréées MULTIMETRIX.
Renseignements et coordonnées sur demande :
Tél. : 02 31 64 51 43 Fax : 02 31 64 51 09
■ Réparation hors de France métropolitaine
Pour toute intervention sous garantie ou hors garantie, retournez l'appareil à votre distributeur.

6. GARANTIE

Notre garantie s'exerce, sauf stipulation expresse, pendant 24 mois après la date de mise à disposition du matériel (extrait de nos Conditions Générales de Vente, communiquées sur demande).

ENGLISH

Thank you for purchasing a VT 12 PHASE TESTER.
For best results with this instrument:

- read this user's manual carefully
- observe the stated safety precautions

SAFETY PRECAUTIONS

- Always test the instrument on line power before using the tester.
- This phase tester must not be considered to be a voltage absence tester (IEC 61243-3 device).
- Do not use on an installation in which the voltage is greater than 1000V with respect to earth and which has an overvoltage category higher than III.

TO ORDER

Phase tester VT 12 P06.2302.02

Supplied with two 1.5V AAA batteries and this User's manual.

1. INTRODUCTION

The VT 12 is a contact-free unipolar alternating-current voltage tester.
It detects the presence of 230VAC 50Hz/60Hz with respect to earth and so allows visual identification of the neutral phase in 400V three-phase/230V single-phase AC networks.
It also has a torch function.

2. TORCH FUNCTION

Press the switch (no. 3) to turn the «torch» on or off.

3. DETECTION OF 230V AC
PHASE IDENTIFICATION

Always test the instrument on line power before using the tester.

3.1 USE
Take the tester in hand and touch the line power outlet cord, or terminal to be tested with the isolated tip (no. 6).
The presence of 230V AC 50/60Hz with respect to earth causes the isolated tip (no. 6) to light.
The presence of 230V AC 50/60Hz with respect to earth thus serves to identify the phase terminal (isolated tip (no. 6) lit) and the neutral terminal (isolated tip (no. 6) off).

3.2 SPECIFIED DOMAIN OF USE
■ Detection of voltage, without contact :
200V~≤U≤265V~.
■ Frequency : 50/60Hz ±5%
■ Maximum voltage with respect to earth : 1000V
■ Response time : < 0,5 second

3.3 DETECTION LIMITS
■ Warning. Because of the principle of operation by capacitive sensor, certain conditions may affect phase detection: presence of a strong electric field, insulating floor covering, wooden ladder, bright sunlight, etc. cable shielding.
The isolated tip (no. 6) can thus light without there being a 230V AC 50/60Hz network voltage in the immediate vicinity of the sensor.

4. GENERAL SPECIFICATIONS

4.1 ENVIRONMENTAL CONDITIONS
Conditions to observe to ensure correct operation.
■ Use indoors only, without splashing water, in conformity with the protective index IP 40.
■ Temperature: -10... +50°C
■ Relative humidity: 0°C-30°C: 95%/30°C-40°C: 75%/40°C-50°C: 45% RH
■ Altitude: upto 2,000m

5. MAINTENANCE

For maintenance, use only specified spare parts.
The manufacturer shall not be held liable for any accident occurring following a repair done other than by its Customer Service Department or an approved repairer.

5.1 REPLACING THE BATTERY

- Lift part no. 4 and push on it to withdraw the battery cover (part no. 2)
- Replace the used 1.5V batteries by batteries of the same type and close the case again before using the tester.

5.2 CLEANING

- Clean the case with a cloth slightly moistened with soapy water. Wipe off with a damp cloth.
Then dry quickly with a cloth or in a hot air flow.

5.3 STORAGE
If the tester is not used for more than 60 days, remove the batteries and store them separately.

5.4 POWER SUPPLY

- 2 batteries 1.5V (AAA, LR03)
- Battery life : 2500 tests of 5 seconds.

5.5 DIMENSIONS AND WEIGHT

- Dimensions : 176 x 26mm (outside)
- Weight : 48g (with battery)

5.6 CONFORMITY WITH STANDARDS

- Electrical safety (to IEC 61010-1)
 - Double insulation
 - Installation category III
 - Degree of pollution 2
 - Rated voltage : 1000V (in relation to the earth)
- Watertightness (to NF EN 60529) : Protection index IP 40.
- Electromagnetic compatibility : (to EN 50081-1 and EN 50082-1) : CE marking.

5.7 REPAIRS
Repairs under or out of guarantee, please return the product to your distributor.

6. WARRANTY

Our guarantee is applicable for 24 months after the date on which the equipment is made available (extract from our General Conditions of Sale, available on request).

DEUTSCH

Wir bedanken uns bei Ihnen für den **VT 12 PHASENPRÜFER** und das damit entgegengebrachte Vertrauen. Um die besten Ergebnisse mit Ihrem Messgerät zu erzielen, bitten wir Sie:

- die vorliegende Bedienungsanleitung **aufmerksam zu lesen** und die darin enthaltenen Sicherheitshinweise **zu beachten**.

|--|

SICHERHEITSHINWEISE

- Das Gerät vor dem Gebrauch immer am Stromnetz testen.
- Das Gerät niemals an Anlagen mit mehr als 1000 V Spannung gegenüber Erde bzw. der Überspannungsklasse III benutzen.

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BESTELLANGABEN

Phasenprüfer VT 12 P06.2302.02

Lieferung mit zwei 1.5 V-Batterien und Bedienungsanleitung

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1. GERÄTEVORSTELLUNG

Der VT 12 ist ein einpoliges, berührungsloses Prüfgerät für Wechselspannung. Spannungserkennung für den Bereich 230VAC 50Hz/ 60Hz gegenüber Erde. Visuelle Erkennung der Neutralphase an 400V ~ Drehstrom / 230 V ~ Einphasenwechselstrom. Mit Stablampenfunktion.

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2. STABLAMPE

Den Schalter (Mark. 3) betätigen, die „Stablampe“ wird ein- und ausgeschaltet.

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3.WECHSELSPANNUNGSERKENNUNG 230V AC - REPÉRAGE DE PHASE
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Das Gerät vor dem Gebrauch immer am Stromnetz testen.

3.1 INBETRIEBNAHME

Den Phasenprüfer in die Hand nehmen und die Isolierspitze (Mark. 6) mit dem Stromnetzanschluss, dem Stromkabel oder der Klemme in Berührung bringen.

Wenn gegenüber der Erde 230V AC 50/60Hz Spannung vorhanden ist, leuchtet die Isolierspitze (Mark. 6) auf.

Dadurch lässt sich die Phasenklemme (Isolierspitze Mark. 6 leuchtet auf) und die Neutralklemme (Isolierspitze Mark. 6 leuchtet nicht) bestimmen.

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3.2 EINSATZBEREICH

- Berührungslose Spannungserkennung : 200V~≤ U ≤ 265V~
- Frequenzbereich : 50/60Hz ±5%
- Max. Spannung gegenüber Erde : 1000V
- Ansprechzeit : < 0,5 s

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3.3 EINSCHRÄNKUNGEN DER ERKENNUNG

- Achtung: wegen des kapazitiven Funktionsprinzips können bestimmte Umgebungsbedingungen die Zuverlässigkeit der Erkennung beeinträchtigen: starke elektrische Felder, gut isolierender Bodenbelag, Holztreppen, starke Sonneneinstrahlung, usw... Kabelummantelung, Die Isolierspitze (Mark. 6) leuchtet in diesem Fall auch dann auf, wenn keine 230V AC 50/60Hz Spannung in unmittelbarer Nähe des Prüfers vorhanden ist.

4. ALLGEMEINE TECHNISCHE DATEN

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4.1 UMGEBUNGSBEDINGUNGEN
Diese Bedingungen sind für den einwandfreien Betrieb einzuhalten!

- Benutzung nur in Innenräumen, ohne Spritzwasserbelastung (Schutzklasse IP 40)
- Temperaturen: -10 ... +50°C
- Luftfeuchte : 0°C - 30°C : 95% HR / 30°C - 40°C : 75% / 40°C - 50°C : 45%
- Meereshöhe: bis 2000 m benutzbar

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5. WARTUNG

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Verwenden Sie für Reparaturen ausschließlich die angegebenen Ersatzteile. Der Hersteller haftet keinesfalls für Unfälle oder Schäden, die nach Reparaturen außerhalb seines Kundendienstnetzes oder durch nicht von ihm zugelassene Reparaturbetriebe entstanden sind.

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5.1 ERSETZEN DER BATTERIEN

- Das Batteriefachgelenk anheben und verschieben (Mark.4).
- Ersetzen Sie die verbrauchten Batterien durch zwei neue Batterien desselben Typs und schrauben Sie die Gehäusehälften wieder zusammen.

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- **5.2 PFLEGE**
Reinigen Sie das Gehäuse mit einem feuchten Lappen und etwas Seifenwasser. Wischen Sie mit klarem Wasser nach. Trocknen Sie das Gehäuse sofort anschließend mit einem trockenen Lappen oder blasen Sie es mit Druckluft ab.

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5.3 LAGERUNG
Falls Sie das Gerät für mehr als 60 Tage nicht benutzen wollen, entfernen Sie die Batterie und lagern Sie diese separat.

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- **5.4 STROMVERSORGUNG**

- 2 Batterien 1.5 V (AAA, IEC LR03)

- Betriebsdauer : 25 000 Prüfungen à 5 s

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- **5.5 ABMESSUNGEN, GEWICHT**

- Außenabmessungen: 176x26 mm

- Gewicht: 48 g (einschl. Batterie)

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- **5.6 NORMENERFÜLLUNG**
Elektrische Sicherheit (gemäß IEC 61010-1)
 - Doppelt schutzisoliert
 - Anlagenklasse III - Verschmutzungsgrad 2
 - Spannungs-klasse: 1000 V
- Schutzklasse IP 40 (gem. EN 60529)
- Elektromagnetische Verträglichkeit (gem. EN 50081-1 und EN 50082-1): CE-Kennzeichnung

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- **5.7 REPARATUREN**
Reparaturen während oder außerhalb des Garantiezeitraumes: senden Sie die Geräte zu Ihrem Wiederverkäufer.

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6. GARANTIE

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Unsere Garantie erstreckt sich auf eine Dauer von 24 Monaten ab dem Zeitpunkt der Bereitstellung des Geräts (Auszug aus unseren allg. Verkaufsbedingungen. Erhältlich auf Anfrage).

ITALIANO

Avete acquistato uno **VT 12 TESTER DI FASE** e vi ringraziamo della vostra fiducia. Per ottenere le migliori prestazioni dal vostro strumento:

- **leggete** attentamente queste istruzioni
- **rispettate** le precauzioni d'uso citate.

|--|

PRECAUZIONI D'USO

|--|

- Testare sempre l'apparecchio sulla rete prima d'utilizzare il tester.
- Questo tester di fase non deve essere considerato come controllore di tensione (IEC 61243-3)
- Non utilizzare in installazione con tensione superiore a 1000 V in riferimento alla terra, categoria di installazio

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PER ORDINARE

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Tester di fase VT 12 P06.2302.02

Fornito con due pile 1.5 V e questo libretto di istruzioni.

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1. PRÉSENTATION

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VT 12 è un tester unipolare di tensione alternata, senza contatto. Esso permette di rivelare la presenza d'una tensione di 230VAC 50Hz/60Hz rispetto alla terra e permette così di reperire visualmente la fase del neutro sui circuiti 400V ~ tri / 230 V ~ mono. L'apparecchio possiede anche una funzione di torcia.

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2. FUNZIONE TORCIA

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Premete l'interruttore (riferimento 3) per accendere o spegnere la "torcia".

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3. RIVELAZIONE DI TENSIONE ALTERNATA 230V AC REPÉRAGE DE PHASE
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Testare sempre l'apparecchio sulla rete prima d'utilizzare il tester.

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3.1 ESECUZIONE
Afferrare il tester e mettere la punta isolata (riferimento 6) in contatto con la presa di rete, il cavo elettrico o il terminale da testare.

In caso di presenza di tensione 230V AC 50/60Hz rispetto alla terra, la punta isolata (riferimento 6) si accende.

La presenza di una tensione di 230VAC 50/60Hz rispetto alla terra permette così d'identificare il terminale di fase (punta isolata, riferimento 6 acceso) e il terminale di neutro (punta isolata, riferimento 6 spento).

|--|

- **3.2 CAMPO DI UTILIZZO**

- Rilevazione di tensione senza contatto: 200V~≤ U ≤ 265V~

- Frequenza : 50/60Hz ±5%

- Tensione max. riferito alla terra : 1000V

- Tempo di riposta : < 0,5 seconde

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3.3 LIMITI DI RILEVAZIONE

- Avvertenza: Visto il principio di funzionamento con sensore capacitivo, alcune condizioni possono pregiudicare la rilevazione di fase: presenza di un campo elettrico intenso, rivestimento isolante del suolo, scala di legno, irradiazione solare intenso..., schermatura del cavo, La punta isolata (riferimento 6) può così accendersi senza che una tensione rete 230V AC 50/60Hz sia nelle immediate vicinanze del sensore.

4. CARATTERISTICHE GENERALI

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4.1 CONDIZIONI AMBIENTALI
Condizioni da rispettare per garantire il buon funzionamento.

- Impiego in interni senza proiezione d'acqua, secondo indice di protezione IP 40.
- Temperatura: -10 ... +50°C
- Umidità relativa: 0°C - 30°C : 95% HR / 30°C - 40°C : 75% / 40°C - 50°C : 45%
- Altitudine: fino a 2000 m

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5. MANUTENZIONE

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Per la manutenzione, utilizzare unicamente i pezzi di ricambio specificati. Il costruttore non sarà responsabile di qualsiasi incidente verificatosi a seguito di una riparazione non effettuata dal servizio di assistenza o da personale autorizzato

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5.1 SOSTITUZIONE DELLA PILA

- Sollevare poi spingere il braccio dello sportello delle pile (riferimento 4).
- Sostituire la pila 1.5 V esaurita con una pila dello stesso tipo (AAA) e richiudere la scatola prima dell'impiego.

|--|

- **5.2 MANUTENZIONE**
Pulire la scatola con uno straccio inumidito con acqua e sapone. Sciacquare con uno straccio umido. Asciugare velocemente con uno straccio o un getto d'aria.

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5.3 STOCCAGGIO
Se il tester non è utilizzato per oltre 60 giorni, togliere la pila e deporla separatamente.

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- **5.4 ALIMENTAZIONE**

- 2 pile 1.5V (AAA, LR03)

- Autonomia: 2500 test da 5 secondi.

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- **5.5 DIMENSIONI E PESO**

- Dimensioni : 176 x 26mm (hors tout)

- Peso : 48g (con pila)

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- **5.6 NORME DI RIFERIMENTO**
Sicurezza elettrica (IEC 61010-1)
 - Doppio isolamento
 - Categoria d'installazione III
 - Grado d'inquinamento 2
 - Tensione attribuita: 1000 V
- Tenuta stagna (NF EN 60529) : Indice di protezione IP 40
- Compatibilità elettromagnetica (EN 50081-1 e EN 50082-1): marcatura CE

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- **5.7 ASSISTENZA**
Per la riparazione in garanzia o fuori garanzia: spedite il Vs. Strumento al Vs. Rivenditore.

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6. GARANZIA

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La nostra garanzia si esercita, salvo disposizione specifica, durante 24 mesi dopo la data di messa a disposizione del materiale (estratto dalle nostre Condizioni Generali di Vendita, disponibile a richiesta).

La presenza di tensione permette d'identificare il morsetto di fase (spia rossa Ph accesa) e il morsetto di neutro (spia rossa Ph spenta).

ESPAÑOL

Acaba de adquirir un **COMPROBADOR DE FASE VT 12** y les agradecemos su confianza. Para obtener el mejor rendimiento de su aparato:

- **lea** detenidamente estas instrucciones de servicio.
- **respete** las precauciones usuales mencionadas en ellas.

|--|

PRECAUCIONES DE USO

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- Siempre probar el aparato en la red antes de utilizar el comprobador.
- Este comprobador de fase no ha de ser considerado como un verificador de ausencia de tensión IEC 61243-3.
- No utilizar en una instalación cuya tensión sea superior a 1000 V en relación a tierra, categoría de sobretensión III.

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PARA CURSAR PEDIDO

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Comprobador de fase VT 12 P06.2302.02

Se entrega con una pila de 9 V y el presente manual de instrucciones

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1. PRESENTACIÓN

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El VT 12 es un comprobador unipolar de tensión alterna, sin contacto.

Permite detectar la presencia de una tensión de 230VAC 50Hz/60Hz con respecto a la tierra, lo que permite identificar visualmente la fase del neutro en las redes 400V ~ clasificación / 230 V ~ mono. También posee una función torcha.

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2. FUNCIÓN TORCHA

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Pulse el interruptor (marca 3) para encender o apagar la "torcha".

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3. DETECCIÓN DE TENSIÓN ALTERNA 230V AC REPÉRAGE DE PHASE

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Siempre probar el aparato en la red antes de utilizar el comprobador.

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3.1 ARRANQUE
Coger el comprobador y poner la punta aislada (marca 6) en contacto con la toma de red, del cable eléctrico o del borne a probar.

En caso de presencia tensión 230V AC 50/60Hz con respecto a la tierra, la punta aislada (marca 6) se enciende.

La presencia de una tensión de 230VAC 50/60Hz con respecto a la tierra permite así identificar el borne de fase (punta aislada (marca 6) encendida) y el borne de neutro (punta aislada (marca 6) apagada).

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- **3.2 AMBITO DE UTILIZACIÓN**

- Detección de tensión sin contacto : 200V~≤ U ≤ 265V~

- Frecuencia : 50/60Hz ±5%

- Tensión máx. en relación a tierra : 1000V

- Tiempo de respuesta : < 0,5 segundos

|--|

3.3 LIMITES DE DETECCIÓN

- Atención: En base al principio de funcionamiento mediante sensor capacitivo, determinadas condiciones podrían afectar a la detección de fase: presencia de un campo eléctrico importante, revestimiento de suelo aislante, escalera de madera, intensidad de la luz solar, blindaje de cable, La punta aislada (marca 6) puede así encenderse sin que una tensión red 230V AC 50/60Hz esté cerca del sensor.

4. CARACTERÍSTICAS GENERALES

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4.1 CONDICIONES AMBIENTALES
Condiciones a tener en cuenta para garantizar el buen funcionamiento del aparato.

- Utilización sólo en interiores, sin salpicaduras de agua, de acuerdo con el índice de protección IP 40.
- Temperatura: -10 ... +50°C
- Humedad relativa: 0°C - 30°C : 95% HR / 30°C - 40°C : 75% / 40°C - 50°C : 45%
- Altitud: hasta 2000 m

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5. MANTENIMIENTO

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Para el mantenimiento utilizar únicamente los recambios especificados. El fabricante no se responsabiliza por accidentes que sean consecuencia de una reparación que no haya sido efectuada por su Servicio Post-Venta o por un taller concertado.

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5.1 CAMBIO DE LA PILA

- Levantar luego empujar el brazo de la tapa de las pilas (marca 4).
- Cambiar la pila 1.5 V defectuosa por otra del mismo tipo (AAA) y volver a cerrar la carcasa antes de su utilización.

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- **5.2 CONSERVACIÓN**
Limpiar la carcasa con un paño ligeramente humedecido con agua jabonosa. Luego pasar un paño humedecido con agua limpia. Secar rápidamente a continuación con un paño seco o con aire caliente.

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5.3 ALMACENAMIENTO
Si no se va a utilizar el comprobador por un período superior a 60 días, extraiga la pila y guárdela por separado.

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- **5.4 ALIMENTACIÓN**

- 2 pila 1.5V (AAA, LR03)

- Autonomía : 25000 pruebas de 5 segundos

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- **5.5 DIMENSIONES Y PESO**

- Dimensiones : 176 x 26mm (exclusivamente el aparato)

- Peso : 48g (con pila)

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- **5.6 CONFORMIDAD CON LAS NORMAS**
Seguridad eléctrica (según CEI 61010-1)
 - Doble aislamiento
 - Categoría de instalación III
 - Categoría de contaminación 2
 - Tensión asignada: 1000 V
- Estandarkeitad (según NF EN 60529): Índice de protección IP 40
- Compatibilidad electromagnética (según EN 50081-1 y EN 50082-1): marca CE

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- **5.7 REPARACIÓN**
Reparación en garantía y fuera de garantía: envíe sus aparatos a su distribuidor

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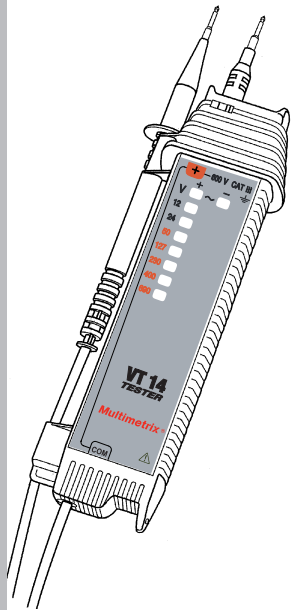
6. GARANTÍA

|--|

Nuestra garantía se aplica, salvo estipulación contraria, durante los 24 meses siguientes a la puesta a disposición del material (extracto de

- TESTEUR
- TESTER
- SPANNUNGSPRÜFER
- TESTER
- COMPROBADOR

VT 14



Multimetrix®

09 - 2015

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Mode d'Emploi
User's Manual
Bedienungsanleitung
Libretto d'Istruzioni
Manual de Instrucciones

FRANCAIS
ENGLISH
DEUTSCH
ITALIANO
ESPAÑOL

Vous venez d'acquérir un **TESTEUR DE TENSION** et nous vous remercions de votre confiance.
Pour obtenir le meilleur service de votre appareil :

- lisez attentivement ce mode d'emploi
- respectez les précautions d'emploi

Significations du symbole 
Attention ! Consulter le mode d'emploi avant d'utiliser l'appareil.
Dans le présent mode d'emploi, les instructions précédées de ce symbole, si elles ne sont pas bien respectées ou réalisées, peuvent occasionner un accident corporel ou endommager l'appareil et les installations.

Signification du symbole 
Cet appareil est protégé par une isolation double ou une isolation renforcée. Il ne nécessite pas de raccordement à la borne de terre de protection pour assurer la sécurité électrique.


Symbole  WEEE 2002/96/EC

PRECAUTIONS D'EMPLOI

- Tension maxi d'utilisation : 690V
- Ne pas utiliser sur une installation dont la tension est supérieure à 600 V par rapport à la terre et dont la catégorie de surtension est supérieure à III.
- Ne jamais toucher les points de touche métalliques pendant un test.

POUR COMMANDER

- **VT 14**P06230203
Livré avec une pile 9 V et ce mode d'emploi

ENGLISH.....
DEUTSCH.....
ITALIANO.....
ESPAÑOL.....

SOMMAIRE

- 1 - PRÉSENTATION.....
- 2 - TEST DE TENSION.....
- 3 - CARACTÉRISTIQUES GÉNÉRALES.....
- 4 - MAINTENANCE.....
- 5 - GARANTIE.....
- 6 - ANNEXE.....

1 - PRÉSENTATION

Voir dessin en 6.Annexe

Le VT 14 est un testeur visuel de tension continue et alternative. Sa tension maxi d'utilisation, 690 V, permet les tests sur une installation triphasée 400 V/690 V tout en respectant la tension maxi par rapport à la terre de 600 V. Ce testeur ne possède pas de fusible et sa conception évite les risques de court-circuit interne.

- ① Pointe de touche (avec entraxe 19 mm)
- ② Garde anti-glissement pour éviter tout contact accidentel avec un conducteur sous tension
- ③ Rampe à LED donnant la valeur de la tension ou de la résistance

2 - TEST DE TENSION

2.1 MISE EN OEUVRE

Mettre la pointe de touche rouge en place dans la borne «+» verrouillable. Prendre le testeur en main, et placer les points de touche aux bornes du circuit à contrôler. La simple présence d'une tension assure le fonctionnement automatique.

2.2 RECONNAISSANCE DU CONTINU OU DE L'ALTERNATIF

- Les deux LED vertes «+» et «-» s'allument : tension alternative
- La LED «+» s'allume : continu, le positif à la pointe de touche du boîtier
- La LED «-» s'allume : continu, le négatif à la pointe de touche du boîtier
- Aucune LED ne s'allume : pas de tension ou tension < 12 V.

2.3 VALEUR DE LA TENSION

- 2 LED vertes : 12V et 24V
 - 5 LED rouges : 50V, 127V, 230V, 400V et 690V
- La dernière LED allumée donne le niveau de tension en présence. Allumage à 85 % de la tension nominale

 En cas d'ensoleillement intense, la perception visuelle de présence de tension peut-être affectée.

2.4 CARACTÉRISTIQUES ET DOMAINE D'UTILISATION

- Détection de tension : 12 V ≤ U ≤ 690 V
- Fréquence : 0 et 50/60 Hz
- Tension maxi par rapport à la terre : 600 V
- Surcharge admissible : 1000 V eff. pendant 30s.
- Consommation : variable suivant la tension. 125 µA à 50 V et 1,7 mA à 690 V
- Impédance : 400 kΩ
- Temps de réponse : < 0,5 seconde
- Durée de test : illimité pour U ≤ 690 V eff.

3 - CARACTERISTIQUES GENERALES

3.1 CONDITIONS D'ENVIRONNEMENT

- Conditions à respecter pour garantir le bon fonctionnement
- Utilisation en intérieur
 - Température : -10 ... +55°C
 - Humidité relative : 10 ... 90 % HR
 - Altitude : jusqu'à 2000 m

3.2 ALIMENTATION

- 1 pile 9 V (6 F 22, 6 LF 22 ou NEDA 1604)
- Autonomie :
 - 5000 tests de 5 secondes avec pile alcaline (6 LF 22)
 - 3500 tests de 5 secondes avec pile ordinaire

3.3 DIMENSIONS ET MASSE

- Dimensions : 193 x 47 x 36 mm (hors tout)
- Masse : 170 g (avec pile)
- Longueur du cordon : 1,20 m
- Diamètre des pointes de touche : 2mm et 3,7 mm

3.4 CONFORMITÉ AUX NORMES

- Sécurité électrique (selon IEC 61010-1, IEC 61010-2-033)
- Double isolation 
- Catégorie d'installation III
- Degré de pollution 2
- Tension assignée: 600V (par rapport à la terre)

Deutsch

Wir bedanken uns bei Ihnen für den Kauf des **SPANNUNGSPRÜFERS** und das damit entgegengebrachte Vertrauen. Um die besten Ergebnisse mit Ihrem Meßgerät zu erzielen, bitten wir Sie :

- die vorliegende Bedienungsanleitung **aufmerksam zu lesen** und die darin enthaltenen Sicherheitshinweise **zu beachten**

Bedeutung des Zeichens 
Achtung ! Beachten Sie vor Benutzung des Gerätes die Hinweise in der Bedienungsanleitung.
Falls die Anweisungen die in vorliegender Bedienungsanleitung nach diesem Zeichen erscheinen nicht beachtet bzw. nicht ausgeführt werden, können körperliche Verletzungen verursacht bzw. das Gerät und die Anlagen beschädigt werden.

Bedeutung des Zeichens 
Das Gerät ist schutzisoliert bzw. durch eine verstärkte Isolierung geschützt. Ein Anschluß an einem Erdleiter ist für die Gewährleistung der elektrischen Sicherheit nicht erforderlich.


Zeichens  WEEE 2002/96/EC

SICHERHEITSHINWEISE

- Die maximal zulässige Eingangsspannung beträgt 690 V.
- Das Gerät niemals an Anlagen mit mehr als 600V Spannung gegenüber Erde bzw. mit einer Überspannungsklasse größer als III benutzen.
- Berühren Sie niemals die metallischen Tastspitzen während einer Prüfung.

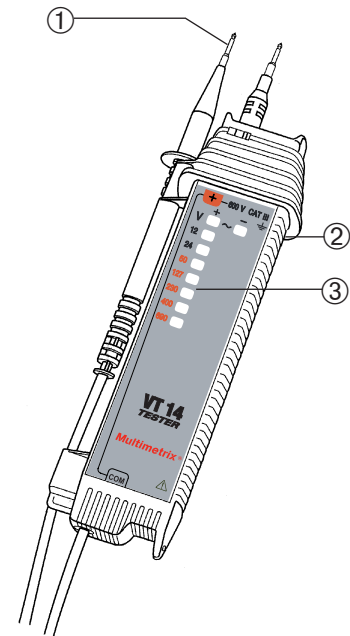
BESTELLANGABEN

- **Spannungsprüfer VT 14****P06230203**
Lieferung mit 9 V-Batterie und Bedienungsanleitung

5 - GARANTIE

Notre garanties s'exerce, sauf stipulation expresse, pendant douze mois après la date de mise à disposition du matériel (extrait de nos Conditions Générales de Vente, communiquées sur demande).

6 - ANNEXE



2.3 WERT DER SPANNUNG

- 2 grüne LEDs für 12 V bzw. 24 V
 - 5 rote LEDs für 50 - 127 - 230 - 400 und 690 V (AC/DC). Die jeweils letzte leuchtende LED der Rampe bezeichnet den Spannungswert. Die LED leuchtet bei Anliegen von 85% der jeweiligen Nennspannung.
-  Bei starker Sonneneinstrahlung kann die Erkennung der Spannungsanzeige durch die Leuchtdioden erschwert sein.

- 2.4 TECHNISCHE DATEN UND EINSATZBEREICH**
- Spannungserkennung im Bereich : 12 V ≤ U ≤ 690 V
 - Frequenzbereich : 0 & 50/60Hz
 - Max. Spannung gegenüber Erde : 600 V
 - Zul. Überlastung : 1000 Veff während 30 s
 - Stromverbrauch : je nach Spannungsspiegel: von 125 µA bei 50 V bis 1,7 mA bei 690 V
 - Eingangsimpedanz : 400 kΩ
 - Ansprechzeit : < 0,5 s
 - Prüfdauer : unbegrenzt bei U ≤ 690 V eff

3 - ALLGEMEINE TECHNISCHE DATEN

- 3.1 UMGEBUNGSBEDINGUNGEN**
-  Diese Bedingungen sind für den einwandfreien Betrieb einzuhalten !
- Benutzung in Innenräumen.
 - Temperaturen : -10° ... +55°C
 - Rel. Luftfeuchte : 10% ... 90%
 - Meereshöhe : bis 2000 m benutzbar

3.2 STROMVERSORGUNG

- 1 Batterie 9V (6 F 22, 6 LF 22 oder NEDA 1604)
- Betriebsdauer :
 - 5 000 Prüfungen à 5 s mit Alkalibatterie (6L22)
 - 3 500 Prüfungen à 5 s mit normaler Batterie

3.3 ABMESSUNGEN, GEWICHT

- Außenabmessungen : 193 x 47 x 36 cm
- Gewicht : 170 g (einschl. Batterie)
- Länge des Meßkabels : 1,20 m
- Durchmesser der Tastspitzen : 2mm bzw. 3,7mm

3.4 NORMENERFÜLLUNG

- Elektrische Sicherheit (gemäß IEC 61010-1, IEC 61010-2-033)
 - Doppelt Schutzisoliert
 - Anlagenklasse III 
 - Verschmutzungsgrad 2
 - Spannungsklasse: 600 V (gegenüber Erde)
- Schutzklasse IP 50 (gem. EN 60529)
- Störaussendung und Störmuntheit im industriellen Umfeld gemäß EN 61326-1

English

Thank you for purchasing a **VOLTAGE TESTER**. To get the best service from this instrument:

- read this user's manual carefully
- respect the safety precautions detailed

Meaning of the symbol 
Warning ! Please refer to the User's Manual before using the instrument.
In this User's Manual, the instructions preceded by the above symbol, should they not be carried out as shown, can result in a physical accident or damage the instrument and the installations.

Meaning of the symbol 
This device is protected by a double insulation or by a reinforced insulation. No linking is required from the protection earth terminal to ensure the electrical security.


Symbole  WEEE 2002/96/EC

SAFETY PRECAUTIONS

- Maximum operating voltage: 690 V.
- Do not use on an installation in which the voltage is greater than 600 V in relation to the earth, and which has an overvoltage category greater than III.
- Never touch the metallic test prods during a test.

TO ORDER

- **Tester VT 14**P06230203
Supplied with a 9 V battery and this User's manual

SUMMARY

- 1 - PRESENTATION
- 2 - VOLTAGE TEST
- 3 - GENERAL SPECIFICATIONS
- 4 - MAINTENANCE
- 5 - WARRANTY
- 6 - APPENDIX

1 - PRESENTATION

See drawing 6.Annex

The VT 14 is an audible and visual DC and AC voltage, continuity and resistance tester. It also has a phase/neutral identification function. Its maximum operating voltage, 690 V, allows tests on a 3-phase 400 V/690 V installation whilst respecting the max voltage in relation to the earth of 600 V.

This tester does not have a fuse and its design avoids risks of internal short circuit.

- ① Test prods (with 19 mm gap)
- ② Non-slip guard to avoid any accidental contact with a live conductor
- ③ Ramp of LED's giving the value of the voltage

2 - VOLTAGE TEST

2.1 HOW TO USE

Place the red test prod in position in the lockable «+» terminal. Hold the tester in your hand and place the test prods at the terminals of the circuit to be tested. The simple presence of a voltage ensures automatic operation.

2.2 RECOGNITION OF DC OR AC

- Both green LED's «+» and «-» light up: AC voltage
- The «+» LED lights: DC, positive at the test prod of the tester
- The «-» LED lights: DC, negative at the test prod of the tester
- No LED lights up: no voltage or voltage < 12 V.

2.3 VALUE OF THE VOLTAGE

- 2 green LED's: 12 V and 24 V
 - 5 red LED's: 50 V, 127 V, 230 V, 400 V and 690 V
- The last LED lit gives the level of voltage present. Lights to 85 % of the nominal voltage.
In case of bright sunlight, the visual perception of the presence of voltage may be affected.

4 - WARTUNG

Verwenden Sie für Reparaturen ausschließlich die angegebenen Ersatzteile. Der Hersteller haftet keinesfalls für Unfälle oder Schäden, die nach Reparaturen außerhalb seines Kundendienstnetzes oder durch nicht von ihm zugelassene Reparaturbetriebe entstanden sind.

4.1 ERSETZEN DER BATTERIE

Trennen Sie den Prüfer von jeder Strom- oder. Spannungsquelle vor Öffnen des Geräts!

- Lösen Sie die beiden Schrauben, und entfernen Sie die untere Gehäusehälfte.
- Ersetzen Sie die verbrauchte Batterie durch eine neue Batterie desselben Typs (6 F 22, 6 LF 22 oder NEDA 1604) und schrauben Sie die Gehäusehälften wieder zusammen.

4.2 PFLEGE

- Reinigen Sie das Gehäuse mit einem feuchten Lappen und etwas Seifenwasser. Wischen Sie mit klarem Wasser nach. Trocknen Sie das Gehäuse sofort anschließend mit einem trockenen Lappen oder blasen Sie es mit Druckluft ab.

4.3 LAGERUNG

Falls Sie das Gerät für mehr als 60 Tage nicht benutzen wollen, entfernen Sie die Batterie und lagern Sie diese separat.

4.4 REPARATUREN

Senden Sie das Gerät bei Reparaturen innerhalb und außerhalb der Garantie an die Chauvin Arnoux Niederlassung oder Ihren Händler zurück.

5 - GARANTIE

Unsere Garantie erstreckt sich auf eine Dauer von zwölf Monaten ab dem Zeitpunkt der Bereitstellung des Geräts (Auszug aus unseren allg. Verkaufsbedingungen. Erhältlich auf Anfrage).

Español

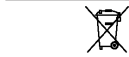
Acaba de adquirir un **COMPROBADOR DE TENSION** y les agradecemos su confianza. Para obtener el mejor rendimiento de su aparato :
■ **lea** atentamente estas instrucciones de servicio
■ **respetar** las precauciones usuales mencionadas en ellas

Significado del símbolo

Atención, consulte el manual de instrucciones antes de utilizar el aparato.
En el presente manual de empleo, las instrucciones precedentes de este símbolo, si no se respetan o realizan, pueden ocasionar un accidente corporal o dañar el equipo o las instalaciones.

Significado del símbolo

Este aparato está protegido por un doble aislamiento o un aislamiento reforzado. No necesita conectarlo al borne de tierra de protección para asegurar la seguridad eléctrica.



Símbolo WEEE 2002/96/EC

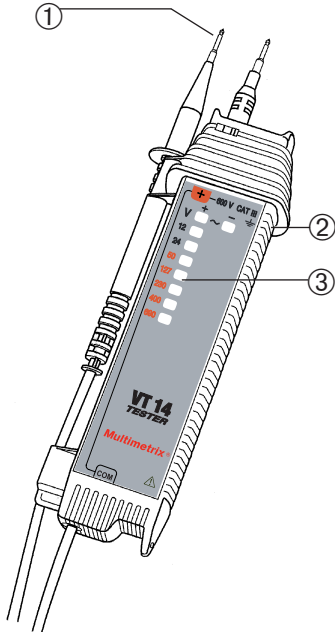
PRECAUCIONES DE EMPLEO

- Tensión máxima de utilización : 690V
- No utilizar en una instalación cuya tensión sea superior a 600 V en relación a tierra, y cuya categoría de sobretensión sea superior a III.
- No tocar jamás las puntas metálicas de prueba durante la realización del test.

PARA CURSAR PEDIDO

■ **Comprobador VT 14**P06230203
Se entrega con una pila de 9V y el presente manual de instrucciones.

6 - ANHANG



INDICE

- 1 - PRÉSENTACION
- 2 - TEST DE TENSION
- 3 - CARACTERISTICAS GENERALES
- 4 - MANTENIMIENTO
- 5 - GARANTIA
- 6 - ANEXO

1 - PRESENTACION

Ver esquema 6.Anexo

EIVT 14 es un comprobador visual de tensión continua y alterna. Su tensión máx. de utilización, 690V, permite llevar a cabo pruebas en una instalación trifásica 400/690 V, respetando la tensión máx. en relación a tierra de 600 V. Este comprobador no posee fusible y su diseño evita los riesgos de cortocircuito interno.
① Punta de prueba (distancia entre ejes 19 mm)
② Protección antideslizante para evitar cualquier contacto accidental con un conductor bajo tensión
③ Escala visual de intensidad o de resistencia

2 - TEST DE TENSION

2.1 PUESTA EN MARCHA

Colocar la punta de prueba roja en posición en el borne "+" bloqueable. Tomar el comprobador con la mano sin pulsar el botón AUTO-TEST y colocar las puntas de prueba en los bornes del circuito que se ha de controlar. La simple presencia de tensión garantiza el funcionamiento automático.

2.2 RECONOCIMIENTO DE TENSION CONTINUA O ALTERNA

- Se encienden los dos LED verdes "+" y "-": tensión alterna
- Se enciende el LED "+-": continua, el positivo en la punta de prueba de la carcasa
- Se enciende el LED "-+": continua, el negativo en la punta de prueba de la carcasa
- No se enciende ningún LED: no hay tensión o la tensión < 12 V.

Italiano

Avete acquistato uno **TESTER DI TENSIONE** e vi ringraziamo della vostra fiducia. Per ottenere le migliori prestazioni dal vostro strumento:

- leggete** attentamente queste istruzioni e **rispettate** le precauzioni d'uso citate.

Significato del simbolo

Attenzione! Consultare il libretto d'istruzioni prima di utilizzare lo strumento.
Nelle presenti istruzioni d'uso, le istruzioni precedute da questo simbolo, se non completamente rispettate o realizzate, possono causare un incidente all'opera-tore o danneggiare l'apparecchio e le installazioni.

Significato del simbolo

Questo apparecchio è protetto da un isolamento doppio o un isolamento rinforzato. L'apparecchio non necessita il collegamento alla presa di terra di protezione per assicurare la sicurezza elettrica.



Símbolo WEEE 2002/96/EC

PRECAUCIONI D'USO

- Tensione max. d'uso : 690 V
- Non utilizzare in installazione con tensione superiore a 600 V in riferimento alla terra, categoria d'installazione III.
- Non toccare la parte metallica dei puntali durante il test.

PER ORDINARE

■ **Tester VT 14**P06230203
Fornito con una pila 9 V e questo libretto di istruzioni

SOMMARIO

- 1 - PRESENTAZIONE.....
- 2 - TEST DI TENSIONE.....
- 3 - CARATTERISTICHE GENERALI.....
- 4 - MANUTENZIONE.....
- 5 - GARANZIA.....
- 6 - ALLEGATO.....

1 - PRESENTAZIONE

Vedere disegno 6.Allegato

Il VT 14 è un tester visivo e sonoro di tensione continua e alternata
Dispone anche della funzione di rilevazione fase/neutro
La sua tensione max. d'impiego, 690 V permette di effettuare i test su di una installazione trifase 400 V/690 V rispetto alla tensione max. in funzione della terra da 600 V
Questo tester è senza fusibili e la sua progettazione permette di evitare i rischi di cortocircuiti interni.
① Puntale
② Protezione anti-scivolamento per evitare qualsiasi contatto con un conduttore in tensione
③ LED per visualizzazione del valore della tensione o della resistenza

2 - TEST DI TENSIONE

2.1 MESSA IN SERVIZIO

Inserire il puntale rosso nel morsetto «+»
Impugnare il tester ai morsetti del circuito da controllare.
La presenza di tensione garantisce il funzionamento automatico

2.2 IDENTIFICAZIONE DELLA TENSIONE CONTINUA O ALTERNATA

- Il due LED verdi «+» e «-» si accendono: tensione alternata
- LED «+» si accende: continua, positivo sul puntale della scatola
- LED «-» si accende: continua, negativo sul puntale della scatola
- Nessun LED si accende: assenza di tensione o tensione < 12 V.

3.4 CONFORMIDAD CON LAS NORMAS

- Seguridad eléctrica (según IEC 61010-1, IEC 61010-2-033)
 - Doble aislamiento
 - Categoría de instalación III
 - Categoría de contaminación 2
 - Tensión asignada: 600V (en relación a tierra)
- Estanteidad (según NF EN 60529): Índice de protección IP 50
- Emisión e inmunidad en medio industrial según EN 61326-1

4 - MANTENIMIENTO

Para el mantenimiento utilizar únicamente los recambios especificados. El fabricante no se responsabiliza por accidentes que sean consecuencia de una reparación que no haya sido efectuada por su Servicio Post-Venta o por un taller concertado.

4.1 CAMBIO DE LA PILA

Desconectar siempre el comprobador de toda fuente de alimentación eléctrica antes de abrir la carcasa.

- Desmontar los dos tornillos de la carcasa inferior
- Cambiar la pila 9 V defectuosa por otra del mismo tipo (6 F 22, 6 LF 22 ó NEDA 1604) y volver a cerrar la carcasa antes de utilizar el comprobador

4.2 CONSERVACION

- Limpiar la carcasa con un paño ligeramente humedecido con agua jabonosa. Luego pasar un paño humedecido con agua limpia. Secar rápidamente a continuación con un paño seco o con aire caliente.

4.3 ALMACENAMIENTO

Si no se va a utilizar el comprobador por un período superior a 60 días, extraiga la pila y guárdela por separado.

4.4 REPARACION

Para las reparaciones ya sean en garantía o fuera de garantía, devuelva el instrumento a su distribuidor.

5 - GARANTIA

Nuestra garanta se aplica, salvo estipulacin contraria, durante los doce meses siguientes a la puesta a disposicin del material (extracto de nuestras Condiciones Generale de Venta, comunicadas sobre demande).

2.3 VALORE DELLA TENSIONE

- 2 LED verdi : 12 V e 24 V
- 5 LED rossi : 50 V, 127 V, 230 V, 400 V e 690 V
L'ultimo LED acceso indica il livello di tensione attuale.
Accensione al 85 % della tensione attuale.
In caso di sole intenso, la percezione visiva della presenza di tensione può essere pregiudicata

- 2.4 CARATTERISTICHE E CAMPO DI UTILIZZO
 - Rilevazione di tensione : 12 V ≤ U ≤ 690 V
 - Frequenza : 0 & 50/60Hz
 - Tensione max. riferimento terra : 600 V
 - Sovraccarichi ammessi : 1000 V eff. per 30 secondi
 - Consummo: variabile a seconda della tensione 125 µA a 50 V e 1,7 mA a 690 V
 - Impedenza : 400 kΩ
 - Tempo di risposta : < 0,5 sec
 - Tempo di durata del test: illimitato per U ≤ 690 V eff.

3 - CARATTERISTICHE GENERALI

3.1 CONDIZIONI AMBIENTALI

Condizioni da rispettare per garantire un buon funzionamento.

- Impiego in interni
- Temperatura : -10 ... +55°C
- Umidità relativa : 10 ... 90 % UR
- Altitudine: fino a 2000 m

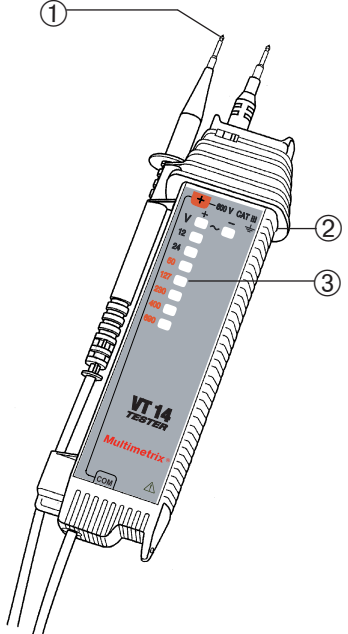
3.3 DIMENSIONI E PESO

- Dimensioni : 193 x 47 x 36 mm
- Peso: 170 g (con pila)
- Lunghezza del cavo : 1,20 m
- Diametro dei puntali : 2 mm e 3,7 mm

3.4 CONFORMITÀ - NORME

- Sicurezza elettrica (secondo IEC 61010-1, IEC 61010-2-033)
 - Doppio isolamento
 - Categoria d'installazione III
 - Grado d'inquinamento 2
 - Tensione attribuita : 600 V
- Tenuta (secondo NF EN 60529) : Indice di protezione IP 50
- Emissione e immunità in ambiente industriale secondo EN 61326-1.

6 - ANEXO



4 - MANUTENZIONE

Per la manutenzione, utilizzare unicamente i pezzi di ricambio specificati. Il cos-truttore non sarà responsabile di qualsiasi incidente verificatosi a seguito di una riparazione non effettuata dal servizio di assistenza o da personale autorizzato

4.1 SOSTITUZIONE DELLA PILA

Prima di aprire la scatola, scollegare sempre il tester dalla rete d'alimentazione elettrica

- Togliere le due viti della mezza-scatola inferiore
- Sostituire la pila 9 V esaurita con una pila dello stesso tipo (6 F 22, 6 LF 22 o NEDA 1604) e richiudere la scatola prima di utilizzare il tester.

4.2 MANUTENZIONE

- Pulire la scatola con uno straccio inumidito con acqua e sapone.
Sciogliere con uno straccio umido. Asciugare velocemente con uno straccio o un getto d'aria.

4.3 STOCCAGGIO

Se il tester non è messo in servizio per oltre 60 giorni, togliere la pila e deporla separatamente.

4.4 RIPARAZIONE

Per qualsiasi intervento da effettuare in o fuori garanzia, si prega d'inviare lo strumento al vostro distributore.

5 - GARANZIA

La nostra garanzia si esercita, salvo disposizione specifica, durante dodici mesi dopo la data di messa a disposizione del materiale (estratto dalle nostre Condizioni Generali di Vendita, disponibile a richiesta).

6 - ALLEGATO

